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BUREAU OF LABOR STATISTICS

ETHELBERT STEWART, Commissioner

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BUREAU OF LABOR STATISTICS } No. 536**

WORKMEN'S INSURANCE AND COMPENSATION SERIES

PROCEEDINGS OF THE SEVENTEENTH ANNUAL MEETING

OF THE

**INTERNATIONAL ASSOCIATION
OF INDUSTRIAL ACCIDENT BOARDS
AND COMMISSIONS**

HELD AT WILMINGTON, DEL.

SEPTEMBER 22-26, 1930



APRIL, 1931

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**ANNUAL MEETING AND OFFICERS OF THE INTERNATIONAL ASSOCIATION OF
INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS**

Annual meetings			President	Secretary-treasurer
No.	Date	Place		
1	Apr. 14, 15, 1914	Lansing, Mich.	John E. Kinnane	Richard L. Drake.
(1)	Jan. 12, 13, 1915	Chicago, Ill.	do.	Do.
2	Sept. 30-Oct. 2, 1915	Seattle, Wash.	do.	Do.
3	Apr. 25-28, 1916	Columbus, Ohio	Floyd L. Daggott	L. A. Tarrell.
4	Aug. 21-23, 1917	Boston, Mass.	Dudley M. Ho man	Royal Meeker.
5	Sept. 24-27, 1918	Madison, Wis.	F. M. Wilcox	Do.
6	Sept. 23-26, 1919	Toronto, Ontario	George A. Kingston	Do.
7	Sept. 20-24, 1920	San Francisco, Calif.	Will J. French	Charles H. Verrill.
8	Sept. 19-23, 1921	Chicago, Ill.	Charles S. Andrus	Ethelbert Stewart.
9	Oct. 9-13, 1922	Baltimore, Md.	Robert E. Lee	Do.
10	Sept. 24-26, 1923	St. Paul, Minn.	F. A. Duxbury	Do.
11	Aug. 26-28, 1924	Halifax, Nova Scotia	Fred W. Arms rong	Do.
12	Aug. 17-20, 1925	Salt Lake City, Utah	O. F. McShane	Do.
13	Sept. 14-17, 1926	Hartford, Conn.	F. M. William	Do.
14	Sept. 27-29, 1927	Atlanta, Ga.	H. M. Stanley	Do.
15	Sept. 11-14, 1928	Paterson, N. J.	Andrew F. McBride	Do.
16	Oct. 8-11, 1929	Buffalo, N. Y.	Frances Perkins	Do.
17	Sept. 22-26, 1930	Wilmington, Del.	Dr. Walter O. Stack	Do.

¹ Special meeting.

Contents

MONDAY, SEPTEMBER 22—AFTERNOON SESSION

Chairman, Walter O. Stack, president I. A. I. A. B. C.

	Page
Test of success of every law, by Walter O. Stack, president I. A. I. A. B. C.	1
Discussion-----	13
O. F. McShane, of Utah.	
Walter O. Stack, of Delaware.	
F. A. Duxbury, of Minnesota.	
Ethelbert Stewart, of Washington, D. C.	
Parke P. Deans, of Virginia.	
Joseph A. Parks, of Massachusetts.	
F. W. Armstrong, of Nova Scotia.	
W. J. Maguire, of Pennsylvania.	
Business meeting:	
Appointment of convention committees-----	15
Report of the secretary-----	16
Financial statement of the treasurer-----	19
Report of medical committee-----	22
Discussion-----	27
Dr. Henry Field Smyth, of Pennsylvania.	
Walter O. Stack, of Delaware.	
Ethelbert Stewart, of Washington, D. C.	
Dr. G. H. Gehrman, of Delaware.	
Joseph A. Parks, of Massachusetts.	
O. F. McShane, of Utah.	
F. A. Duxbury, of Minnesota.	
R. K. Jones, of Delaware.	
Fred M. Wilcox, of Wisconsin.	
R. B. Morley, of Ontario.	

TUESDAY, SEPTEMBER 23—MORNING SESSION

Chairman, Fred W. Armstrong, vice chairman Workmen's Compensation Board of Nova Scotia

Separate interstate and intrastate cases, by Fred M. Wilcox, chairman	
Industrial Commission of Wisconsin-----	42
Discussion-----	49
F. A. Duxbury, of Minnesota.	
Fred M. Wilcox, of Wisconsin.	
Border line between maritime law and compensation cases with specific instances and cases, by Sam Laughlin, commissioner State Industrial Accident Commission of Oregon-----	49
Discussion-----	55
Jerome G. Locke, of New York.	
Donald D. Garcelon, of Maine.	
I. K. Huber, of Oklahoma.	
Fred M. Wilcox, of Wisconsin.	
O. F. McShane, of Utah.	
G. Clay Baker, of Kansas.	
What power should commissions and boards have to compel testimony, by Matt H. Allen, chairman Industrial Commission of North Carolina--	60
Discussion-----	65
O. F. McShane, of Utah.	
Matt H. Allen, of North Carolina.	
W. H. Stutsman, of North Dakota.	
G. Clay Baker, of Kansas.	
Robert J. Hoage, of Washington, D. C.	
Fred M. Wilcox, of Wisconsin.	
H. J. Halford, of Ontario.	
Ethelbert Stewart, of Washington, D. C.	
Joseph A. Parks, of Massachusetts.	

TUESDAY, SEPTEMBER 23—AFTERNOON SESSION

	Page
Chairman, Wellington T. Leonard, chairman Industrial Commission of Ohio	
Rights and liabilities of the employee and employer, respectively, in third-party cases, by Abel Klaw, of counsel E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Del.-----	75
Discussion-----	82
O. F. McShane, of Utah.	
Wellington T. Leonard, of Ohio.	
Newer problems of the United States Employees' Compensation Commission, by Walter W. Warwick, chief counsel of the United States Employees' Compensation Commission-----	83
How shall we treat willful misconduct, and where is the border line, by Mrs. F. L. Roblin, commissioner State Industrial Commission of Oklahoma-----	91
Discussion-----	95
Wellington T. Leonard, of Ohio.	
Lawrence E. Worstell, of Idaho.	
F. A. Duxbury, of Minnesota.	
H. J. Halford, of Ontario.	
How the workmen's compensation law is working in the District of Columbia, by R. J. Hoage, deputy commissioner United States Employees' Compensation Commission-----	100
Classifications and accident reports as a means to reasonable compensation insurance rates, by Gregory C. Kelly, general manager Delaware-Pennsylvania Compensation Rating and Inspection Bureaus-----	106
Discussion-----	109
Ethelbert Stewart, of Washington, D. C.	
H. M. Stanley, of Georgia.	
Gregory C. Kelly, of Pennsylvania.	
F. A. Duxbury, of Minnesota.	
O. F. McShane, of Utah.	
Eugene B. Patton, of New York.	
Leifur Magnusson, of Washington, D. C.	
Henry McColl, of Minnesota.	
Fred M. Wilcox, of Wisconsin.	
Purpose, nature, and character of compensation laws, by F. A. Duxbury, member Industrial Commission of Minnesota-----	121
Discussion-----	132
H. H. Willoughby, of Illinois.	
A. J. Altmeyer, of Wisconsin.	
F. A. Duxbury, of Minnesota.	
Fred M. Wilcox, of Wisconsin.	
H. J. Halford, of Ontario.	
Wellington T. Leonard, of Ohio.	

WEDNESDAY, SEPTEMBER 24—MORNING SESSION

	Page
Chairman, R. B. Morley, general manager Industrial Accident Prevention Associations, Ontario	
The influence of factory inspection on plant safety, by John P. Meade, director division of industrial safety, Department of Labor and Industries of Massachusetts-----	139
Discussion-----	151
Charles H. Weeks, of New Jersey.	
James L. Gernon, of New York.	
Why the State should promote safety education, by Thomas P. Kearns, superintendent division of safety and hygiene, Department of Industrial Relations of Ohio-----	161
Discussion-----	167
R. McA. Keown, of Wisconsin.	
Fred M. Rosseland, of New Jersey.	

	Page
Cost of industrial accidents to the State, the employer, and the man, by H. W. Heinrich, assistant superintendent engineering and inspection division, Travelers Insurance Co.....	171

WEDNESDAY, SEPTEMBER 24—AFTERNOON SESSION

Chairman, John Roach, Deputy Commissioner of Labor of New Jersey

Discussion on cost of industrial accidents to the State, the employer, and the man.....	180
Joseph E. Plumstead, of Delaware.	
Leonard W. Hatch, of New York.	
Effect of mechanization of the coal-mining industry upon the frequency and severity of accidents, by Daniel Harrington, chief engineer safety division, United States Bureau of Mines.....	183
Discussion.....	192
John Roach, of New Jersey.	
Ethelbert Stewart, of Washington, D. C.	
Leonard W. Hatch, of New York.	
Joseph A. Parks, of Massachusetts.	
W. H. Stutsman, of North Dakota.	
Leifur Magnusson, of Washington, D. C.	
O. F. McShane, of Utah.	
Handling-material accidents, by W. Graham Cole, director safety service, Policyholders Service Bureau, Metropolitan Life Insurance Co.....	194
Discussion.....	199
Charles Senft, of New Jersey.	
William H. Kiler, of Delaware.	
Is the foreman the key man in safety, by Frank O'Connor, welfare superintendent of dye works, E. I. du Pont de Nemours & Co. (Inc.), Penns Grove, N. J.....	208
Discussion.....	211
Walter Dent Smith, of Delaware.	
Will J. French, of California.	
How can statistics be made helpful in accident-prevention work, by A. R. Lawrence, chairman Compensation Rating and Inspection Bureau of New Jersey.....	215
How can statistics be made more helpful in accident-prevention work, by William J. Maguire, director Bureau of Statistics, Department of Labor and Industry of Pennsylvania.....	219
Discussion.....	225
Parke P. Deans, of Virginia.	
William J. Maguire, of Pennsylvania.	
John Roach, of New Jersey.	
O. F. McShane, of Utah.	
H. B. Myers, of Illinois.	
Thomas P. Kearns, of Ohio.	
State experience in controlling premiums, by Frank P. Evans, statistician Industrial Commission of Virginia.....	230
Discussion.....	234
H. M. Stanley, of Georgia.	
Parke P. Deans, of Virginia.	
William J. Maguire, of Pennsylvania.	
John Roach, of New Jersey.	
Eugene B. Patton, of New York.	
A short review of workmen's compensation legislation in Porto Rico, by P. Rivera Martinez, commissioner Industrial Commission of Porto Rico.....	235
Discussion.....	244
O. F. McShane, of Utah.	
P. Rivera Martinez, of Porto Rico.	
F. A. Duxbury, of Minnesota.	
John Roach, of New Jersey.	
Fred M. Wilcox, of Wisconsin.	
Report of committee on statistics and compensation insurance costs.....	247

THURSDAY, SEPTEMBER 25—MORNING SESSION

Chairman, Russel Kessel, M. D., chief medical examiner Workmen's Compensation Department of West Virginia

	Page
The workmen's compensation act in relation to handicapped individuals, by Frank G. Pedley, M. D., Montreal General Hospital.....	249
Discussion	252
Dr. Thomas R. Crowder, of Illinois.	
Miss Frances Perkins, of New York.	
Joseph A. Parks, of Massachusetts.	
O. F. McShane, of Utah.	
Leonard W. Hatch, of New York.	
Ethelbert Stewart, of Washington, D. C.	
H. J. Halford, of Ontario.	
F. M. Williams, of Connecticut.	
Dr. Frank G. Pedley, of Montreal.	
An employer's recommendation as to employment of persons with physical impairment, by Joseph Bancroft, president Joseph Bancroft & Sons Co., Wilmington, Del.....	262
Discussion	265
O. T. Fell, of Ohio.	
I. K. Huber, of Oklahoma.	
Joseph Bancroft, of Delaware.	
F. A. Duxbury, of Minnesota.	
Eugene B. Patton, of New York.	
Ethelbert Stewart, of Washington, D. C.	
Rehabilitation, by C. P. Hutchins, M. D., rehabilitation expert Aetna Clinic, Syracuse, N. Y.....	272
Psychiatry and industry, by Frederick C. Robbins, M. D., United States Veterans' Hospital, Perry Point, Md.....	274
Discussion	277
Dr. Richard H. Price, of Delaware.	
Dr. Frederick C. Robbins, of Maryland.	

THURSDAY, SEPTEMBER 25—AFTERNOON SESSION

Chairman, G. H. Gehrman, M. D., medical director E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Del.

Fractured skulls and their permanent manifestations, by John J. Moorhead, M. D., New York City.....	281
Discussion	286
Dr. Francis C. Grant, of Pennsylvania.	
Dr. James G. Spackman, of Delaware.	
Dr. Russel Kessel, of West Virginia.	
Ethelbert Stewart, of Washington, D. C.	
Dr. Frederick C. Robbins, of Maryland.	
Joseph A. Parks, of Massachusetts.	
Dr. John J. Moorhead, of New York.	
The effects of chemical cases, by Maj. Gen. H. L. Gilchrist, Chief of Chemical Warfare Service, United States Army.....	293
Discussion	306
William J. Maguire, of Pennsylvania.	
Maj. Gen. H. L. Gilchrist, of Washington, D. C.	
Dr. Frank G. Pedley, of Montreal.	
Thomas P. Kearns, of Ohio.	
The classification of heart disease from the standpoint of employment, by Olin S. Allen, M. D., of Wilmington, Del.....	307
Discussion	312
Dr. C. H. Watson, of New York.	
F. A. Duxbury, of Minnesota.	
What are the health hazards of the spray-coating industry, by Henry Field Smyth, M. D., Dr. P. H., assistant professor of industrial health, University of Pennsylvania.....	316
Discussion	322
Ethelbert Stewart, of Washington, D. C.	
Thomas P. Kearns, of Ohio.	

*FRIDAY, SEPTEMBER 26—MORNING SESSION***Business meeting: Chairman, W. O. Stack, president I. A. I. A. B. C.**

	Page
Report of auditing committee.....	323
Report of committee on resolutions.....	323
Report of committee on president's report.....	324
Discussion on third-party liability.....	324
Joseph A. Parks, of Massachusetts.	
Parke P. Deans, of Virginia.	

Appendixes

APPENDIX A.—Officers and members of committees for 1930-31.....	327
APPENDIX B.—Constitution of the International Association of Industrial Accident Boards and Commissions.....	329
APPENDIX C.—List of persons who attended the seventeenth annual meeting of the International Association of Industrial Accident Boards and Commissions, held at Wilmington, Del., September 22-26, 1930.....	331
APPENDIX D.—Letter from F. M. Wilcox, chairman Industrial Commission of Wisconsin, re cost of occupational disease coverage.....	336

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APRIL, 1931

PROCEEDINGS OF THE SEVENTEENTH ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCI- DENT BOARDS AND COMMISSIONS, WILMINGTON, DEL., SEPTEMBER 22-26, 1930

MONDAY, SEPTEMBER 22—AFTERNOON SESSION

Chairman, Walter O. Stack, president I. A. I. A. B. C.

The first session of the seventeenth annual meeting of the International Association of Industrial Accident Boards and Commissions was called to order and the president of the association made the following address:

Test of Success of Every Law

By WALTER O. STACK, *president I. A. I. A. B. C.*

The real test of the success of every law is its effect upon society as a whole. Of the many excellent laws enacted by the law-making bodies of Europe, Great Britain, Canada, and the United States during the last 40 or so years, none, in my opinion, has had a more wholesome effect upon society as a whole or been of greater benefit to humanity than the workmen's compensation laws. Into these laws have been written standards of social justice which have been so consistently applied to industrial problems, with but a few exceptions, that we find existing in the industrial world to-day a bond of common interests between capital and labor, employers and employees, that has eradicated from the body politic a state of hatred and envy, fear and distrust, strife and economic waste, which theretofore had threatened the very foundation of society.

Out of chaos and insecurity was born a new spirit, a spirit that has gone far in humanizing industrial relations, a spirit that has advanced those higher ideals of universal brotherhood in the social structure of the world to-day.

In this world-wide movement toward friendlier and more intimate contact between two great elements of society, the workmen's compensation laws have been a distinctive agency. The permanency of these friendly relations will, however, in my judgment, depend

upon the course of future legislation and the manner in which laws are administered. The work of the industrial accident boards and commissions is in importance second only to that of the judiciary. Therefore, we can not take our official duties too seriously. Ideals and standards of social justice are gauged by results. A law of itself can obtain results only if it has the support of public opinion. So to the economic and social problems of to-day we must conscientiously apply humanitarian ideals and principles that we may have the support of public opinion. That great law maker, Justinian, said: "Justice is a firm and continuous desire to render to every one that which is his due." This rule of justice applies not only to individuals but also to States.

Extraterritorial Rights Contrary to Express Language of the Constitution of the United States

Due to diversity of local interests and division of opinions among the framers of the first workmen's compensation laws passed in the United States and Canada, many of the compensatory provisions of the present-day acts were matters of omission early recognized by this association. So into those first acts have been written many excellent amendments liberalizing the law, but in so doing some of the States grievously erred in writing into their acts so-called extraterritorial rights whereby they would assume jurisdiction over accidents occurring in other States on the ground that the contract of hire of the injured had been made in the State alleging jurisdiction. Personally I do not approve of such legislation; for in my opinion it is unsound in principle and illegal in practice; contrary to the express language of the Constitution of the United States, which wisely gives to the States in which such accidents occur regulatory police powers that can not be abridged or denied them by a legislative act of another State. Such legislation causes abuse and confusion; is but an arrogating step in an economic dictatorship in matters of workmen's compensation legislation and, in the administration of a law which the aggressor had no part in making, an attempt to usurp the governmental prerogatives of sister States never contemplated by the framers of the American compensation laws.

The very first section of the Delaware act reads in part: "This act * * * shall apply to all accidents occurring within this State, irrespective of the place where the contract of hiring was made, renewed, or extended * * *" and, my friends, that section was written by lawyers eminently qualified. Lincoln said: "Let every man remember that to violate the law is to trample on the blood of his fathers and to tear the character from his own and his children's liberty," yet the authors of the so-called extraterritorial compensation laws invite employers, going into States that require them to report all accidents and pay compensation to the injured in accordance with the provisions of the compensation laws of the State in which they are operating, to "violate the law" of those States. The Industrial Accident Board of Delaware has had three or more such cases during the year, and in each case has compelled the guilty parties to comply with the provisions of the Delaware workmen's compensation law. Nor are the cases just cited all.

The officials of one of our oldest industrial plants, employing upward of 2,000 men when conditions are normal, were recently asked by another State to report an accident sustained by an employee transferred some months before to the local plant, on the ground the injured man was originally hired in the State from which he was transferred and in which, I believe, his family was still living. On advice of our board and the legal department of the company the request of the State asking for the report was ignored. If such assumption of authority over the administration of workmen's compensation laws was judicially sound, the Industrial Accident Board of Delaware could, because of Delaware's many ramifications in American industry, by merely amending its act assume jurisdiction over compensation cases in practically every State in the United States.

Charles E. Hughes, Chief Justice of the United States Supreme Court, in addressing the American Bar Association last month, said in part:

Not only the security but the efficiency of the Union lies in the appropriate maintenance of the authority of the States within the proper spheres of local government and local policy.

Mr. Justice Brandeis, of the same court, said in part in the case of the New York Central Railroad *v.* Winfield (244 U. S. 147):

Though the principle that compensation should be made or relief given is of universal application, the great diversity of conditions in the different sections of the United States may, in a wise application of the principles, call for differences between States in the amount and method of compensation, the periods in which the payment shall be made, and the methods and means by which the funds shall be distributed.

Resort to Minor Technicalities—Abuse of Law

Another matter of grave importance to every jurisdiction is the continual attempts made by some of the insurance companies to escape their moral and legal obligations by resorting to minor technicalities. Even in cases in which the insurance companies had collected premiums on the employer's pay roll and were fully aware of the class of work in which the employer and his employees were engaged, have these companies tried to evade their obligations. To illustrate the type of cases I have in mind, I will briefly cite two cases in which the Industrial Accident Board of Delaware awarded compensation during the year. The first was a dredging operation, cost of which was paid by the State of Delaware to the contractor, and in which the Federal Government had no interest. The operation consisted of cutting a channel through a narrow strip of land, dividing the ocean from an inland bay, for the purpose of admitting the flow of a larger volume of salt water into the bay for the benefit of fish, crabs, oysters, and clams therein. While he was employed on a small dredge digging the channel one of the workmen was injured. The insurance carrier denied him compensation, alleging his work was maritime. At the hearing it was proved that the company knew the character of the work the employer was going to do, had known during the whole of the operation, and had collected premiums from the contractor or employer on the basis of his entire pay roll, including the injured workman. The other case was that of

a man employed by the contractor as captain of a small boat used by the employer to carry workmen from the Delaware shore to the New Jersey shore and back. The insurance carrier first denied compensation on the ground the injured workman was owner of the boat and therefore was a contractor. Then upon the employer proving, at an informal hearing, the injured workman's contractual relations with the employer were those of an employee, the insurance company next alleged, when the case was called for a formal hearing, that the employer of the injured workman was engaged in maritime work at the time he was injured—that is, while he was attempting to board the boat tied up at the wharf. The fact that the industrial accident board compelled the insurance carrier to pay compensation in both cases does not relieve this association of a very definite responsibility in such cases, and I would therefore recommend the abuse be referred to a committee on workmen's compensation law, if such a committee is created in accordance with my recommendations, for the purpose of working out means of correcting these injustices to employers and employees; however, if such a committee is not authorized, a special committee might be appointed for that purpose.

Camouflaging Limitations of Coverage

Another class of offenders are the insurance carriers who attempt to camouflage limitations of coverage. By this term I mean the carriers who give employers the impression their policies cover every form of accident regardless of the source of their origin or the definition of the word "accident" as expressed in the act.

Attempts to Charge Cost and Losses Growing Out of Court Cases to Compensation Losses

For instance, the Delaware act does not cover occupational diseases per se, yet in one case, after the industrial accident board had refused to accept jurisdiction because the evidence conclusively convinced the board the employee's disability, if due to his employment, was a matter of legal tort, the insurance carrier in defending the employer in a court of law charged not only the cost but the amount recovered by the employee to its workmen's compensation experience in the classification affected in that particular industry, and would have increased the compensation rate to every one in the industry to offset its loss if the industrial accident board had not discovered this in its audit. I admit it was creditable on the part of the insurance carrier to make good its promise, although of no value in its application to the compensation laws of the State, by defending the employer in court, but it was improper, to say the least, to charge the cost and amount recovered by the employee to the losses sustained in the industry—to its compensation losses. It seems to me one way of correcting these abuses might be to change the standard workmen's compensation policies so as to require the insurance carrier to write into the policies the physical history of the work the employer and employees are engaged in, and, furthermore, that the carriers in the first group of cases cited shall agree that collection of premiums on the employer's pay roll shall be considered

prima facie evidence of their irrevocable promise to pay compensation to such employees or their dependents, unless they can show fraud or deception had been practiced by the employer in the declaration of his business.

Recommendations

I recommend that the following amendments be made to the constitution of the association:

ARTICLE VI

SECTION 1. The annual meetings of the association shall convene on the fourth Monday in May; and the association, or executive committee, shall in determining the place of meeting consider the geographical conveniences and equity of expenses of delegates participating. Special meetings may be called by the executive committee, who shall likewise consider the geographical conveniences and equity of expenses of the members attending. Notices for the special meetings must be sent out at least one month in advance of the date of said meetings.

ARTICLE VII

SECTION 2. The association shall have a president, first and second vice presidents, and a secretary-treasurer.

SEC. 3. The president, vice presidents, and secretary-treasurer shall be elected at the annual meetings of the association and shall assume office at the last session of the annual meeting at which they have been elected.

SEC. 4. If for any reason an officer of this association shall cease to be connected with any agency entitled to active membership before the expiration of his or her term, his or her term of office shall expire on the day his or her official connection with said agency terminates.

SEC. 5 (new section). If for any cause a vacancy occurs in the office of president, the first vice president shall become president for the remainder of the term of the said president, and upon the first vice president assuming the office of president, the second vice president shall become first vice president for the remainder of the term of office for which his or her predecessor was elected, and shall in case of a vacancy occurring in the office of president while he or she is serving as first vice president serve as president until his or her successor is elected at the next annual meeting of the association; *Provided, however,* If for any reason a vacancy occurs in the office of president that can not be filled in the manner as above provided for, the executive committee shall appoint his or her successor.

SEC. 6 (new section). If for any reason a vacancy occurs in the office of the secretary-treasurer, the said vacancy shall be filled by the executive committee appointing some one to serve until the next special or annual meeting of the association.

ARTICLE VIII

SECTION 1. There shall be an executive committee of the association, which shall consist of the president, first and second vice presidents, the retiring president, secretary-treasurer, and five other members elected by the association at the annual meeting.

SEC. 2. The duties of the executive committee shall be to formulate programs for all annual and other meetings and to make needed arrangements for such meetings; to pass upon applications for associate membership; to fill all offices which may become vacant not otherwise provided for in the articles of the constitution of the association.

ARTICLE IX

SECTION 1. The president, or the first vice president, or the second vice president, the secretary-treasurer or his or her representative, and one other member of the executive committee shall constitute a quorum of that committee.

I further recommend that two additional permanent committees be created; one to be known as the committee on rehabilitation of the injured workers and their restoration to industry, and the other as

the committee on workmen's compensation legislation, in accordance with paragraphs (c) and (f) of Article II of the constitution; and that in addition to the two new permanent committees above suggested your president be authorized to appoint a special committee to study the French system of compensating for specific permanent loss of body members, whereby the age of the injured is used as a basis for computing compensation, reference to which was made by my learned predecessor, Frances Perkins, at the Buffalo meeting. As the constitution, so far as I am able to interpret it, makes no specific provision for the appointment of permanent committees, or does not fix definitely the number that shall serve on such committees, I recommend that the committee appointed to consider the president's recommendations regarding amendments to the constitution give this matter its careful consideration.

My reasons for recommending the several amendments to the constitution are:

(1) In considering geographical distances most convenient to all the boards and commissions, the expenses and the time of delegates participating could be more equitably distributed, thereby enabling a larger number to attend the meetings.

(2) If my recommendations are favorably acted upon, weather conditions are usually favorable the last week of May in places where the meetings would most likely be held.

(3) The whole membership of the association would more directly participate in filling a vacancy occurring in the office of president because their delegates had voted for the vice presidents at the preceding meeting of the association.

Medical

Pursuant to the resolutions adopted at the Buffalo meeting, Dr. George H. Gehrman, medical director for the E. I. du Pont de Nemours & Co., whom I appointed chairman of the medical committee and whose training and wide experience eminently qualify him, undertook with the assistance of outstanding men of the medical profession the study of the most modern methods of medical treatments in compensation cases with the idea of assimilating the knowledge gained as a result of their investigation and to recommend some concrete plan which the medical colleges in the United States and Canada could incorporate into their curriculums that the resources of their organizations might be made more helpful in restoring the industrially injured to normal anatomical fitness and sound healthy condition. I congratulate the association on having fostered this movement in promoting the highest services possible for the relief of suffering humanity.

As I said, in part, in addressing the eighth annual convention of the Eastern Homeopathic Medical Association, soon after leaving the Buffalo meeting, on the moral, social, and legal responsibilities of the medical profession in workmen's compensation cases:

Unfortunately some members of the medical profession do not appreciate * * * that workmen's compensation laws have created a new field in medicine and surgery that requires special training, a well-equipped workroom,

and competent help—that so necessary is the need of a wider knowledge in this field of medicine and surgery, I believe every medical school should be required to have qualified teachers for the subject.

As our friend the learned Dr. John J. Moorhead, who will read a paper before the meeting on Thursday, has said, speaking on the subject:

The day has gone by when the hospital care of the injured can be assigned to junior members of the visiting or house staff, and the profession and laity alike are keenly aware that the maximum of care and attention means the minimum of disability.

Dr. Frederick A. Besley, chairman of the board of traumatic surgery of the American College of Surgeons, said, in speaking on this subject before the college:

Thirty years ago a fractured leg was given major attention by the surgeon. Then interest turned to research in cancer, goiter, and other diseases, to the neglect of traumatic surgery.

So, gentlemen of the convention, we stand not alone in our demand that the medical colleges give traumatic surgery and the various cases of occupational diseases chargeable to industry their serious consideration, for as that great apostle of homeopathy, Hahnemann, said:

When one has to do with an art, the end of which is the saving of human life, any neglect to make one's self thoroughly master of it is a Crime.

Doctor Gehrman will make his report during the afternoon.

The desirability of special training in traumatic surgery and industrial medicine is also being considered in South America. I take this from a letter I received in July from Dr. Jose M. Laurnagaray, of Buenos Aires, in which he stated he was "making a comparative study of legal medicine with special reference to work accidents" and, in that connection, would like to have the laws of Delaware and other States.

Safety

In spite of constructive efforts made by this association, individual industrial accident boards and commissions, the national and community safety councils, industrial accidents are on the increase if, in reaching our conclusions, we use as our basis hours of exposure to employment. According to the records available, there were 23,000 industrial deaths and 3,125,000 nonfatal lost-time cases in the United States in the year 1929, with attendant economic losses, according to an estimate of the United States Bureau of Labor Statistics, of over \$1,000,000,000.

In the 3-year period from 1927 to 1929, inclusive, injuries of a temporary character decreased as did the number of days lost from such injuries. However, there were more fatalities and more permanent injuries, on the basis of the hours of exposure to employment, to which I have referred. As you all know, annual accident cost is based upon the number and severity of accidents. So severity rates and frequency rates are matters of importance; were they not, we could be less concerned about our failure to reduce the severity rate at the same time we have reduced the frequency rate. Although I am not able to find definite cause or causes for decrease in frequency

with attendant increase in severity, the following possible reasons have been suggested to me by a friend qualified to speak on the subject:

(1) The increased use of machinery which, while tending to discourage minor accidents, results in injuries of greater severity when accidents do occur.

(2) The general speeding up of our industrial life.

(3) The unemployment situation that developed during the latter part of 1929, resulting in doubling up of duties.

(4) The possibility that safety workers have concentrated their efforts unduly on minor hazards with the result that the more serious hazards have been neglected.

As the above figures of killed and injured last year in American industry are but an estimate based on the best existing data, I would recommend that each industrial accident board or commission ask of its legislature sufficient funds, where funds are now insufficient, to make it possible to determine accurately the number of industrial accident deaths and injuries occurring in its jurisdiction, and that such compilation be promptly furnished this association and the United States Bureau of Labor Statistics, as it is said the first essential in the solution of any problem is an accurate knowledge of facts.

I regret that I am not able to furnish a similar report for the Dominion of Canada. A reasonable analysis of the situation there may, however, be arrived at by taking for our working basis the report of the Province of Ontario furnished me by Mr. R. B. Morley, general manager of the Industrial Accident Prevention Associations of that Province. During the year 1927 there were 429 fatal accidents and 71,550 nonfatal, bringing the total to 71,979 industrial accidents during that year. In the year 1928 there were 553 fatal accidents and 78,845 nonfatal, making a total of 79,398 industrial accidents, and in the year 1929 there were 510 fatal and 86,593 nonfatal accidents, making a total of 87,103 industrial accidents in that year.

While each one of us appreciates the importance of definite legal safety requirements as a factor in safety promotion, I feel they are local problems that should be left to the States and Provinces to work out. I do, however, urge that the industrial accident boards and commissions lend every possible encouragement to the work of organized safety councils. In Delaware the activities of the Delaware Safety Council over a period of years have in my judgment, based upon a most intimate contact with it, been responsible to a large degree for the fact that Delaware has lower industrial frequency and severity rates than would be expected by the various industries engaged in operations in the State. A recent analysis by Mr. A. A. Rydgren, vice president and actuary of the Continental American Life Insurance Co., covering the last three years, shows that Delaware's frequency is only 63 per cent and the severity only 56 per cent of the expected frequency and severity in similar lines of industry in the country as a whole, giving to Delaware one of the lowest compensation insurance rates in the United States and Canada with attendant higher compensatory provisions than in States paying a higher compensation insurance rate.

Having accepted our responsibilities in matters of accident prevention in the United States and Canadian industry, we must continue to carry on. "Give light and the people will find their way" is a proverb we might well apply to our educational program. Let us believe that "all we have accomplished * * * is but the commencement—merely the twilight of the dawn." Talk safety until, if the industrial worker must have corns, he will grow them on the bottom of his feet so nobody can step on them.

Committees

Appreciating the importance of safety as a valuable part of our work, I, in appointing the committee on safety, enlarged its number, continuing Mr. John Roach, of New Jersey, as chairman, with Mr. R. B. Morley, of the Province of Ontario, Canada, as vice chairman.

According to the resolution of the Buffalo meeting, to which I have already referred, I also enlarged the medical committee. By the help of Doctor Gehrman, there was added to it some of the outstanding men in their special field of medicine.

The committee on statistics, of which Dr. Leonard W. Hatch, of New York, is chairman, has worked unselfishly in its division of our work.

The committee on investigation of results of compensation awards, of which the scholarly and lovable Ethelbert Stewart is chairman, will give us a most illuminating report.

Correspondence

During January I had some correspondence with Hon. Peter J. Glick, secretary of labor and industry of Pennsylvania, relative to a conversation and subsequent correspondence with Maj. John S. Spicer of his department, regarding a proposed section in the National Safety Council for governmental labor officials, in which I stated that I was in thorough sympathy with the nation-wide humanitarian and constructive efforts of that organization in the conservation of limb, life, and property and believed that such a personal contact as suggested could be made most helpful. To that end I suggest that the convention consider the advisability of authorizing the president of our association to send to the annual meetings of the National Safety Council, at the expense of the association, the chairman of the committee on safety, or some other member of the association, who would assemble such data on safety emanating from those meetings as he believed would be of interest to our membership and report it to the president of the association, who must in turn report it to the boards and commissions of the association. Such a plan would in no manner interfere with individual boards and commissions participating in the National Safety Council meetings but would, on the other hand, furnish boards and commissions unable to attend useful information on the subject matter.

In July I received from Miss Agnes L. Peterson, Assistant Director of the Women's Bureau, United States Department of Labor, a comprehensive and illuminating report of some 71 pages, with

charts attached, of a study made by her and her collaborators of accidents that had occurred to women in American industry. I have suggested to her that she have a summary of the report made and mail it to the industrial accident boards and commissions, attaching thereto statistical and economic reasons for separating industrial accidents occurring to women from those sustained by men for the information of those who control public appropriations.

During February and March I wrote personal letters to the president or chairman of each industrial accident board and commission in the United States, Hawaii, Porto Rico, and the Dominion of Canada relative to the work of the association and the Wilmington meeting. On August 28 I addressed personal letters, with advance copies of the program for the Wilmington meeting, to the governors of the States of the United States, Porto Rico, Hawaii, and the Provinces of the Dominion of Canada, sending out in the same mail personal letters, with advance copies of the program, to members of the industrial accident boards and commissions of the States and Provinces. I felt it was particularly appropriate that the governors should be addressed that they may know better the character of the work the association is doing and the program planned for this meeting.

In April I had a meeting in Washington with Vice President Deans and Mr. Ethelbert Stewart of the executive committee, Mr. John Roach, chairman of the committee on safety, and Dr. George H. Gehrman, chairman of the medical committee, for the purpose of shaping a tentative program for the Wilmington meeting. The results of our labors are found in the papers and those who will present and discuss them.

Workmen's Compensation Legislation and Two Important Decisions of the United States Supreme Court

It may be said that the legislative year 1930 has been an inactive period in the field of workmen's compensation legislation, principally due to the fact that only approximately 15 per cent of the State legislatures met.

Of the 44 States having compensation laws, only 7 convened in regular session (Kentucky, Louisiana, Massachusetts, New Jersey, New York, Rhode Island, and Virginia). Of this number only four States (Louisiana, Massachusetts, New York, and Virginia) acted upon the subject of workmen's compensation. Two States without compensation laws (Mississippi and South Carolina) held regular sessions but took no action in this field. The legislatures of eight States (Idaho, Illinois, Kansas, Maine, Nebraska, New Jersey, Texas, and Utah) met in special session in 1930 but did not enact any compensation legislation. The Congress of the United States has also been in session since our last meeting at Buffalo but contributed nothing toward the development of compensation already extended to Federal employees, longshoremen and harbor workers, and private employees in the District of Columbia.

Of the four States acting on the subject of workmen's compensation, the largest number of amendments was passed by Massachusetts, followed by New York, Virginia, and Louisiana.

The action of Virginia is deserving of particular attention by reason of the important and liberalizing effect of the amendments to the act. The waiting period was reduced from 10 to 7 days, and the benefits were increased in death and disability (partial and total) cases from 50 to 55 per cent of weekly wages. The maximum weekly payments were increased from \$12 to \$14, and the maximum amount from \$4,500 to \$5,600, while the allowance for funeral expenses was increased from \$100 to \$150. Provision was also made for a legislative study looking toward the creation of a State insurance fund in this State.

New York liberalized its act by increasing the minimum weekly benefits in case of loss of both eyes from \$8 to \$15, and allowing compensation to be awarded for neck as well as head disfigurements, subject, however, to a maximum of \$3,500. Massachusetts extended the period of compensation, with certain limitations, in case of finger injuries from 12 to 22 weeks for the loss of two phalanges and to 30 weeks for the loss of three or more phalanges. Louisiana enlarged the jurisdiction in dispute cases so as to include the judge of the district court of the parish in which the accident occurred.

The subject of coverage also received attention in New York and Massachusetts. In the State of New York a corporation officer is now automatically covered unless an election otherwise is made. In Massachusetts a person is conclusively presumed to be an "employee" while operating any vehicle, with the employer's general authorization and in the performance of his business, either within or without the State. The Massachusetts act was also amended so as to exclude inmates of institutions from the provisions of the act relating to public employments. New York broadened the application of the radium and X-ray provisions and added to the list of compensable occupational diseases disabilities arising from blisters or abrasions, bursitis or synovitis, and dermatitis. Other legislation of less importance was also adopted in these States, tending toward an improvement in the administration of the several acts.

Two Territorial legislatures (those of the Philippine Islands and Porto Rico) met in regular session in 1930. While that of Porto Rico enacted several amendments making minor changes in the administration of the act as well as additional provisions for the liquidation of the "Workmen's relief trust fund," the Legislature of the Philippine Islands (now in session) from latest official information available has not made any change in the basic act adopted in 1927.

Of the eight Canadian Provinces having compensation laws, only three (Manitoba, Nova Scotia, and Saskatchewan) acted on the subject during 1930. Manitoba adopted the largest number of amendments to the act and showed an active interest in liberalizing the law and improving its administration, while in Nova Scotia the only statute passed was that transferring the dredging industry from the collective liability scheme under the act to the individual liability plan. Saskatchewan merely clarified a provision which has caused administrative confusion, by eliminating "persons whose work is mainly clerical" from the list of exclusions under the definition of "workman," since such persons are not in any manner within the scope of the act.

Among the large number of decisions rendered by the courts on the subject of workmen's compensation during the past year, two cases decided by the Supreme Court of the United States on April 14, 1930, are worthy of attention.

The first is the case of *John Baizley Iron Works v. Span*. In this case an employee of a Philadelphia company was injured while doing repair and painting work in the engine room of a vessel which was tied up at a pier in the Delaware River at Philadelphia. A compensation claim was filed by the employee with the Pennsylvania Workmen's Compensation Board, and an award was granted. Upon subsequent appeals by the employer, the award was upheld by the State compensation board and by the several State courts of Pennsylvania. The Pennsylvania Supreme Court declared that when the employee was injured he "was doing work of a nature which had no direct relation to navigation or commerce." The United States Supreme Court, however, on a later appeal by the employer, did not concur in the view expressed by the State court, and in a divided opinion held that the work which the employee was performing was directly related to navigation and commerce. "Obviously," the court said, "unless the State workmen's compensation act changed or modified the rules of the general maritime law, the rights and liabilities of both the employer and the employee in respect of the latter's injuries were fixed by those rules, and any cause arising out of them was within the admiralty jurisdiction."

The other case was that of *Nogueira v. New York, New Haven & Hartford Railroad Co.*, in which the Supreme Court held that a railroad car float of 500 tons, while in navigable waters, was subject to the maritime law like any other vessel and that an employee injured while so employed must look to the Federal longshoremen's and harbor workers' compensation act for relief. Mr. Chief Justice Hughes, in defining the word "employer" under the act, held that the definition was "manifestly broad enough to embrace a railroad company, provided it has employees who are employed in maritime employment in whole or in part upon the navigable waters of the United States." From the standpoint of maritime employment, the court said that it made no difference "whether the freight is placed in the hold or on the deck of a vessel or whether the vessel is a car float or a steamship."

Our annual meetings have become firmly fixed institutions in the affairs of workmen's compensation in the United States and Canada. Past meetings have been of the greatest value to the association, and if the spirit of unselfish service that has animated them is continued they will be of greater value in the future. They have proved "Consultation and deliberation are not the end of wisdom," as Demosthenes believed, but the living evidence of increased knowledge, of progress and advancement toward the achievement of the goal we would reach in a public service dedicated to social and economic justice.

As his excellency Gov. C. Douglass Buck, of Delaware, has said in his letter addressed to our guests on page 3 of the program, "Cooperation is an achievement greatly to be desired, whether it be between countries, States, classes, or individuals—the ability to fit ourselves into the general plan in which all are to have a part."

In conclusion, I want to thank the several committees, Mr. Charles F. Sharkey, Mr. Ethelbert Stewart, and the membership at large for the splendid support all have given me, in which they have expressed a loyalty that has been most gratifying. I wish also to thank you for the honor you have done me and my State. I trust you will all return to your homes better equipped for your official duties and rich in pleasant, happy memories of Delaware and her people.

DISCUSSION

Mr. McSHANE (Utah). Referring to page 8 of your address, did Mr. Morley give you the man-hour exposure for those years?

President STACK. I was unable to get anything more than a summary from Mr. Morley's office; otherwise I would have had the full report.

Mr. DUXBURY (Minnesota). I wonder if any action has been taken by the president to bring the matter of the recommendations in the president's address formally before the association; for instance, the proposed amendments to the constitution.

President STACK. My own notion about it was that probably all that would be necessary would be simply to refer them to a committee on amendments to the constitution.

Mr. DUXBURY. I want to know whether it is necessary to have a special committee to do it.

Secretary STEWART. It seems to me the president's address requires two committees.

Mr. DUXBURY. At least two, I think.

Secretary STEWART. One on amendments to the constitution, which has been tentatively provided for; that is, the executive committee took that matter up, and plans have been made to appoint such a committee; however, the president's address mentioned a number of other things, and I should like to suggest, if Mr. Duxbury will do it, that it be moved that a committee on the president's address be appointed to take up those matters other than the constitutional amendments.

President STACK. A special committee?

Secretary STEWART. A convention committee.

Mr. DEANS (Virginia). I do not want to interfere with Senator Duxbury, but I will make a motion that the president's address be referred to the past presidents of the association who are present. [The motion was seconded.]

Mr. PARKS (Massachusetts). How many past presidents are here?

President STACK. Mr. Armstrong, Senator Duxbury, Mr. Wilcox, Mr. McShane. Mr. Stanley and Mr. Williams may be here, and Miss Perkins will be here on Thursday. Mr. Deans, if the Chair may suggest, would you be willing to amend that by adding Mr. Stewart to that committee?

Mr. DEANS. I shall be glad to do that.

Mr. DUXBURY. I wish to amend that by adding that Mr. Wilcox, of Wisconsin, be chairman of the committee. He is probably the oldest past president here.

Secretary STEWART. Is this a committee on constitutional changes or on president's address?

Mr. DEANS. My motion was intended to refer this entire report to this committee, and if it desired it could recommend that certain portions of the report be referred to other committees.

Mr. DUXBURY. I understood from Mr. Stewart that constitutional amendments were already provided for.

Secretary STEWART. Tentatively; yes.

Mr. DUXBURY. So the committee will bring them formally before us.

Secretary STEWART. It could just as well come before the committee Mr. Deans proposes.

Mr. DUXBURY. It has been suggested by one of the members of that committee that it would be a good idea to let the committee know just what its limitations will be so it will not exceed them.

President STACK. The Chair is not inclined to place any limitation on that committee's work. I know that the committee will handle the president's report fairly and say all it wants to thereon, and its recommendations should not be limited.

Mr. ARMSTRONG (Nova Scotia). If it is in order, I would move that there be two committees appointed. I think that is the best way. There is too much in this report to leave to one committee. On the constitutional amendments the committees can get together and consult over them, but they have to consult the other members. In the other the same thing will take place.

President STACK. Is it your idea there should be one committee on president's report?

Mr. ARMSTRONG. Outside of the constitutional amendments.

President STACK. And another one on constitutional amendments? Mr. Deans, you made the motion.

Mr. ARMSTRONG. I understand Mr. Deans's motion has not been seconded.

Mr. PARKS. Yes, I intended to, if I did not.

President STACK. Mr. Deans, to save time would you be willing to incorporate that in your motion or change it so as to incorporate that?

Mr. DEANS. I am waiting for a second to Mr. Armstrong's motion. [Mr. Armstrong's motion was not seconded.]

Mr. DEANS. If it is the wish of the body, I am; but I think we have an excellent committee and there is no need to divide it.

President STACK. The vote is on Mr. Deans's motion, seconded by Mr. Parks, of Massachusetts, that the president's report shall be referred to a committee consisting of the past presidents of the association who are present, and Mr. Stewart, the secretary.

[The motion was carried, with but one dissenting vote.]

Mr. DUXBURY. What is the matter with the dissenter?

Secretary STEWART. I think there are two jobs there. It is too late now. Go ahead.

Mr. DUXBURY. You are right, as usual.

Secretary STEWART. Of course I am right. That's the way I am made. Mr. President, you are supposed to appoint three convention committees, one on auditing the report of the treasurer.

Mr. MAGUIRE (Pennsylvania). Before proceeding further, there is a copy of the constitution and by-laws in the program, and Article X of the constitution provides—

This constitution or any clause thereof may be repealed or amended at any regularly called meeting of the association. Notice of any such changes must be read in open meeting on the first day of the conference, and all changes of which notice shall have thus been given shall be referred to a special committee, which shall report thereon at the last business meeting of the conference. No change in the constitution shall be made except by a two-thirds vote of the members present and voting.

So, I think your constitution really provides a way of making constitutional amendments entirely outside of the president's report.

Secretary STEWART. But that has been done. A special committee has been appointed to consider the president's report, but the president's report embodies the constitutional amendments. It seems to me Article X has been entirely complied with.

Business Meeting

[The president appointed the following convention committees:]

Auditing committee.—W. H. Horner, of Pennsylvania, chairman; Parke P. Deans, of Virginia; Wellington T. Leonard, of Ohio; H. J. Halford, of Ontario; H. M. Stanley, of Georgia.

Committee on resolutions.—Charles R. Blunt, New Jersey, chairman; Fred M. Wilcox, of Wisconsin; H. H. Willoughby, of Illinois; F. A. Duxbury, of Minnesota; Joseph A. Parks, of Massachusetts.

Nominating committee.—O. F. McShane, of Utah, chairman; Matt H. Allen, of North Carolina; Sam Laughlin, of Oregon; Fred W. Armstrong, of Nova Scotia; L. W. Hatch, of New York.

Committee on president's address.—Fred M. Wilcox, of Wisconsin, chairman; F. A. Duxbury, of Minnesota; F. W. Armstrong, of Nova Scotia; O. F. McShane, of Utah; H. M. Stanley, of Georgia; F. M. Williams, of Connecticut; Miss Frances Perkins, of New York; and Mr. Stewart, our secretary.

President STACK. Next is the report of the secretary and treasurer.

Secretary STEWART. The report of the secretary is mimeographed in such detail as is necessary to be given and will be found on the table, so I will not attempt to read it.

[Mr. Stewart presented extracts of the secretary's report and the treasurer's report both of which appear in full below, and in addition said:]

In the matter of an American remarriage table on which we have been working for several years, we have in hand 14,613 returns from widow cases. The work in the last year has been practically nil. The New York Department of the Casualty Insurance Underwriters has undertaken to construct an American remarriage table and we have decided to cooperate with it, furnishing them our 14,000 or 15,000 cases and let it do the work.

The Bureau of Labor Statistics has just finished and has ready for the printer a translation of all of the workmen's compensation laws of Latin American republics, including those of the States of

Mexico, and I am going to introduce a resolution at this convention repeating one introduced some years ago, that an all-American convention of workmen's compensation interests be called either in Rio de Janeiro, Brazil, in Lima, Peru, in Mexico City, in Washington, D. C., or in Toronto, Canada, whichever seems to be the most appropriate, and that we find out whether the Pan American Union and the Department of State are ready at this time to get behind such a meeting of compensation groups.

You authorized me to do this some six or eight years ago—I do not remember just how long ago it was. I took it up with the Department of State, which said that the time was very inopportune, and we dropped the matter there. Of course that was shortly after the war, which I presume had something to do with it.

You will find the itemized receipts and expenditures in the treasurer's report. The cash in the bank as of September 15, 1930, was \$2,294.96. The reason, Mr. President, why we have so much cash in the bank is because at the last convention I was instructed to appropriate and set apart \$500 for the use of the medical committee. I did as I was told, but that committee has not withdrawn the money; it has not drawn upon that fund so far, even to 1 cent. I am still holding it because I do not know what that committee expects to do, but at any rate there will be a sum for investment, and if that committee does not use that \$500 there will be quite a considerable sum for investment.

REPORT OF THE SECRETARY

Since the sixteenth annual convention the North Carolina Industrial Commission has joined the association and the list of active members stands at 37, as follows:

- United States Bureau of Labor Statistics.
- United States Employees' Compensation Commission.
- Arizona Industrial Commission.
- California Industrial Accident Commission.
- Connecticut Board of Compensation Commissioners.
- Delaware Industrial Accident Board.
- Georgia Industrial Commission.
- Idaho Industrial Accident Board.
- Illinois Industrial Commission.
- Indiana Industrial Board.
- Iowa Workmen's Compensation Service.
- Kansas Commission of Labor and Industry.
- Maine Industrial Accident Commission.
- Maryland State Industrial Accident Commission.
- Massachusetts Department of Industrial Accidents.
- Minnesota Industrial Commission.
- Montana Industrial Accident Board.
- Nevada Industrial Commission.
- New Jersey Department of Labor.
- New York Department of Labor.
- North Carolina Industrial Commission.
- North Dakota Workmen's Compensation Bureau.
- Ohio Industrial Commission.
- Oklahoma State Industrial Commission.
- Oregon State Industrial Accident Commission.
- Pennsylvania Department of Labor and Industry.
- Utah Industrial Commission.
- Virginia Industrial Commission.
- Washington Department of Labor and Industries.
- West Virginia Workmen's Compensation Department.

Wisconsin Industrial Commission.
 Wyoming Workmen's Compensation Department.
 Department of Labor of Canada.
 New Brunswick Workmen's Compensation Board.
 Nova Scotia Workmen's Compensation Board.
 Ontario Workmen's Compensation Board.
 Quebec Workmen's Compensation Commission.

The above list includes three organizations, the United States Bureau of Labor Statistics, the United States Employees' Compensation Commission, and the Department of Labor of Canada, which are given full powers of membership by the terms of the constitution itself and are exempt from the payment of dues.

Two new Canadian members were added to the associate membership list, Mr. A. Gaboury, secretary general of the Province of Quebec Safety League, and Mr. J. F. H. Wyse, general manager of the Canadian National Safety League. The list of associate members now numbers 10, as follows:

George E. Beers, attorney and counselor at law, New Haven, Conn.
 Walter F. Dodd, Yale University School of Law, New Haven, Conn.
 E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Del.
 A. Gaboury, secretary general, Province of Quebec Safety League, Montreal.
 I. K. Huber, The Empire Companies, Bartlesville, Okla.
 Industrial Accident Prevention Associations, Toronto, Ontario.
 Lefjur Magnusson, American representative, International Labor Office, Washington, D. C.
 Porto Rico Industrial Commission.
 Republic Steel Corporation, Youngstown, Ohio.
 J. F. H. Wyse, Canadian National Safety League, Toronto, Ontario.

During the year the association continued its cooperation with the American Standards Association in its work of drafting national safety codes. Your representatives have participated actively in the preparation of several codes now under consideration. Since the last meeting the following safety codes have been issued, in the formulation of which the association was represented:

Bul. No. 509. Textile Safety Code.
 Bul. No. 512. Code for Identification of Gas-Mask Canisters.
 Bul. No. 519. Safety Code for Woodworking Plants.

The bulletin numbers given above refer to the publication numbers of the United States Bureau of Labor Statistics, and copies can be secured by requesting them from that bureau.

A revision of the Abrasive Wheel Safety Code, for which the association is a sponsor, was approved, and is now in process of publication by the United States Bureau of Labor Statistics.¹

The secretary now has on file in his office 14,613 forms containing data relative to widows' compensation cases, for use in compiling an American remarriage table. Owing to the amount of work already before the committee on statistics and compensation insurance costs that committee has not as yet been able to begin the work of tabulating these forms.

The secretary wishes to lay before the convention the following communication which was received in his office:

International Medical Congress
 Industrial Accidents and Occupational Diseases
 August, 1931, at Geneva

OFFICE OF THE GENERAL SECRETARY, DR. C. G. YEESIN,
Geneva, July 1930.

SIRS AND VERY HONORED COLLEAGUES: Upon the advice of Doctor Donoghue, of Boston, I am taking the liberty of sending you herewith the list of speakers on the principal subjects in the program of the 1931 international congress.

¹ Now published as Bul. No. 527.

This congress will be held in Geneva the first week of August, 1931, and we hope that it will interest your fellow countrymen.

In order to facilitate proceedings and centralize information we have appealed to the national committees to keep those who will take part in the congress in touch with developments. On the committee for the United States are Doctor Hayhurst, State board of health, Columbus, Ohio, and Dr. Francis Donoghue, Statehouse, Boston, Mass.

We are entirely at your service for all further information and hope that you will be able to take part in the congress.

Accept, etc.

(Signed) YERSIN.

The subjects mentioned in the list inclosed with the above letter were:

1. Slow results and evolution of the traumatic wounds of the spine.
2. Traumatism of blood vessels (arteritis and thrombophlebitis).
3. Cutaneous affections in relation with labor accidents and maladies.
4. Previous state by consequences of labor accidents.

Besides these topics, already determined, other questions will be discussed, which interest more particularly the "labor medicine." * * *

An exposition of radiographies, photographs, and moldings will be held.

The secretary is also in receipt of a letter from Hon. Sol Bloom, Member of Congress, associate director of the United States Commission for the Celebration of the Two Hundredth Anniversary of the Birth of George Washington, as follows:

For the consideration of your organization at its forthcoming convention the United States Commission for the Celebration of the Two Hundredth Anniversary of the Birth of George Washington requests your indorsement of the celebration in 1932, and invites your moral support and cooperation in doing your share to make it all that it should be.

An account of the origin, purpose, and plan of the commission is submitted together with the personnel, which is headed by the President of the United States.

The commission is anxious to enlist the full collaboration of every organization, business house, church, school, and home in this great Republic and is relying upon the interest and support of your members, individually and collectively. In order that formal expression may be given your attitude in this matter, would it not be possible to secure passage by your organization of some such resolution as that inclosed.

The suggested resolution inclosed with this letter is given below:

Whereas the Congress of the United States has created a commission to arrange a fitting nation-wide observance of the two hundredth anniversary of the birth of George Washington in 1932; and

Whereas the commission so created, composed of the President of the United States, the Vice President of the United States, the Speaker of the House of Representatives, four Members of the United States Senate, four Members of the House of Representatives, and eight citizens appointed by the President of the United States, is charged with the duty of planning and directing the celebration; and

Whereas the high purpose of the event is to commemorate the life, character, and achievements of the most illustrious citizen of our Republic and to give every man, woman, and child living under the Stars and Stripes an opportunity to take part in the celebration, which will be outstanding in the world's history; and

Whereas the George Washington Bicentennial Commission, desiring the full cooperation of the people in the United States, has extended a most cordial and urgent invitation to our organization to participate in the celebration; Therefore be it

Resolved, That the International Association of Industrial Accident Boards and Commissions does hereby indorse the program of observance of the two hundredth anniversary of the birth of George Washington, to take place in 1932; accept with appreciation the invitation of the George Washington Bicentennial Commission, and pledge this organization to extend earnest cooperation to the United States Commission in all possible ways, so that future

generations of American citizens may be inspired to live according to the example and precepts of Washington's exalted life and character, and thus perpetuate the American Republic; and be it further

Resolved, That this resolution be incorporated in the official proceedings of this meeting and that a copy thereof be transmitted to the George Washington Bicentennial Commission, Washington, D. C.

Attention is called to the wonderful program of the convention this year. This was printed for the association free of charge by E. I. du Pont de Nemours & Co. (Inc.), and is only one of the many services rendered by this member in its enthusiastic preparations for this convention.

The proceedings of the Buffalo convention have been published by the United States Bureau of Labor Statistics as its Bulletin No. 511, and copies are available at the headquarters here or will be sent from the bureau upon request.

Respectfully submitted.

ETHELBERT STEWART, *Secretary-Treasurer*.

FINANCIAL STATEMENT OF THE TREASURER

BALANCE AND RECEIPTS

1929		
Sept. 17.	Balance in bank, \$2,403.82; unexpended postage and telegraph fund, \$1.36	\$2,405.18
20.	Walter F. Dodd, 1930 dues (associate)	10.00
	I. K. Huber, 1930 dues (associate)	10.00
Oct. 14.	New Brunswick Workmen's Compensation Board, 1930 dues	50.00
	Ohio Industrial Commission, 1930 dues	50.00
15.	Interest on registered Liberty bonds (\$700)	14.88
21.	Interest on Paterson Mortgage & Title Guaranty Co. certificate (\$1,500)	41.25
24.	North Carolina Industrial Commission, 1930 dues	50.00
30.	Montana Industrial Accident Board, 1930 dues	50.00
	J. F. H. Wyse, Canadian National Safety League, 1930 dues (associate)	10.00
Nov. 15.	Interest on coupon Liberty bond (\$1,000)	21.25
19.	A. Gaboury, Province of Quebec Safety League, 1930 dues, (associate)	10.00
1930		
Apr. 1.	Interest on coupon Liberty bond (\$1,000)	21.25
	Interest on registered Liberty bonds (\$700)	14.87
16.	Interest on Canadian bonds (\$500)	13.75
22.	Cash received for five \$100 Canadian bonds (Dominion of Canada Nos. 1852-6, inclusive)	500.00
	Interest on Paterson Mortgage & Title Guaranty Co. certificate (\$1,500)	41.25
June 9.	I. K. Huber, 1931 dues (associate)	10.00
July 7.	Walter F. Dodd, 1931 dues (associate)	10.00
	E. I. du Pont de Nemours & Co. (Inc.) 1931 dues (associate)	10.00
	Quebec Workmen's Compensation Commission, 1931 dues	50.00
	J. F. H. Wyse, Canadian National Safety League, 1931 dues (associate)	10.00
11.	Leifur Magnusson, International Labor Office, 1931 dues (associate)	10.00
	Geo. E. Beers, 1931 dues (associate)	10.00
	Ontario Workmen's Compensation Board, 1931 dues	50.00
	New Brunswick Workmen's Compensation Board, 1931 dues	50.00
16.	Industrial Accident Prevention Associations, 1931 dues (associate)	10.00
	Nevada Industrial Commission, 1931 dues	50.00

July	24.	A. Gaboury, Province of Quebec Safety League, 1931 dues (associate)	\$10.00
		North Dakota Workmen's Compensation Bureau, 1931 dues.....	50.00
		Wisconsin Industrial Commission, 1931 dues.....	50.00
	28.	Virginia Industrial Commission, 1931 dues.....	50.00
		Arizona Industrial Commission, 1931 dues.....	50.00
	30.	Connecticut Board of Compensation Commissioners, one-fifth of 1931 dues (fourth district).....	10.00
		Republic Steel Corporation, 1931 dues (associate).....	10.00
		Delaware Industrial Accident Board, 1931 dues.....	50.00
Aug.	4.	Massachusetts Department of Industrial Accidents, 1931 dues.....	50.00
		California Department of Industrial Relations, 1931 dues.....	50.00
		Connecticut Board of Compensation Commissioners, one-fifth of 1931 dues (fifth district).....	10.00
		Wyoming Workmen's Compensation Department, 1931 dues.....	50.00
		Georgia Industrial Commission, 1931 dues.....	50.00
	11.	Maine Industrial Accident Commission, 1931 dues.....	50.00
		Connecticut Board of Compensation Commissioners, one-fifth of 1931 dues (first district).....	10.00
		Connecticut Board of Compensation Commissioners, one-fifth of 1931 dues (second district).....	10.00
	15.	Connecticut Board of Compensation Commissioners, one-fifth of 1931 dues (third district).....	10.00
		Maryland State Industrial Accident Commission, 1931 dues.....	50.00
		Utah Industrial Commission, 1931 dues.....	50.00
		North Carolina Industrial Commission, 1931 dues.....	50.00
		Minnesota Industrial Commission, 1931 dues.....	50.00
	18.	Pennsylvania Department of Labor and Industry, 1931 dues.....	50.00
		West Virginia Workmen's Compensation Department, 1931 dues.....	50.00
		Nova Scotia Workmen's Compensation Board, 1931 dues.....	50.00
	27.	Washington Department of Labor and Industries, 1931 dues.....	50.00
		Oregon State Industrial Accident Commission, 1931 dues.....	50.00
		Illinois Industrial Commission, 1931 dues.....	50.00
		New York Department of Labor, 1931 dues.....	50.00
Sept.	2.	Ohio Industrial Commission, 1931 dues.....	50.00
		Porto Rico Industrial Commission, 1931 due (associate).....	10.00
	11.	Indiana Industrial Board, 1931 dues.....	50.00
		New Jersey Department of Labor, 1931 dues.....	50.00
	15.	Interest on Canadian bond (\$1,000).....	22.50
		Interest on bank account to July 1, 1930.....	39.88
			4,925.56

DISBURSEMENTS

1929	17.	Postage and telegraph fund.....	\$1.36
Oct.	4.	Postage and telegraph fund.....	5.00
	14.	Ethelbert Stewart, expenses attending Buffalo convention.....	16.10
	15.	Miss E. E. Smith, services at Buffalo convention.....	25.00
		Mrs. K. M. Stall, service at Buffalo convention.....	25.00
	31.	Exchange on New Brunswick Workmen's Compensation Board, 1930 dues.....	.75
Nov.	1.	Maryland Casualty Co., bonding secretary-treasurer to October 23, 1930.....	12.50
	7.	Master Reporting Co. (Inc.), reporting Buffalo convention.....	434.92
Dec.	5.	Exchange on J. F. H. Wyse 1930 dues (Association, etc.).....	.20
	17.	Ethelbert Stewart, partial payment honorarium, 1929-30.....	200.00
		Glenn L. Tibbott, partial payment for clerical services, 1929-30.....	100.00
1930	17.	Postage and telegraph fund.....	5.00
Jan.	20.	Gibson Bros. (Inc.), printing 2,000 letterheads.....	26.50

Mar. 25. Dr. Walter O. Stack, postage expense in president's office	\$10. 00
Apr. 30. Parke P. Deans, expenses attending program committee meeting April 30	15. 40
May 2. John Roach, expenses attending program committee meeting April 30	31. 09
Dominion of Canada bond, 4½ per cent, due January 2, 1936 (No. 024880) (\$1,000.)	1, 001. 38
June 30. Ethelbert Stewart, balance of honorarium 1929-30	400. 00
July 7. Postage and telegraph fund	5. 00
Aug. 2. Exchange on 1931 dues, J. F. H. Wyse, Quebec Workmen's Compensation Commission, Ontario Workmen's Compensation Board, the New Brunswick Workmen's Compensation Board	. 40
8. Glenn L. Tibbott, balance for clerical services, 1929-30	300. 00
18. Dr. Walter O. Stack, postage expense in president's office	10. 00
Sept. 11. Postage and telegraph fund	² 5. 00
	<hr/>
	2, 630. 60
Sept. 15. Balance, bank deposits	2, 294. 96
	<hr/>
	4, 925. 56

SUMMARY OF RECEIPTS AND DISBURSEMENTS

RECEIPTS

Cash in bank, September 17, 1929	\$2, 403. 82
Cash in postage and telegraph fund, September 17, 1929	1. 36
Membership dues	1, 790. 00
Interest:	
Securities	\$191. 00
Bank deposits	39. 38
	<hr/>
	230. 38
Matured Canadian bonds	500. 00
	<hr/>
	4, 925. 56

DISBURSEMENTS

Postage and telegraph, secretary's office	\$21. 36
Postage and telegraph, president's office	20. 00
Printing	26. 50
Reporting proceedings, sixteenth annual convention	434. 92
Bonding secretary-treasurer	12. 50
Honorarium and clerical service in secretary-treasurer's office	1, 000. 00
Clerical service at sixteenth annual convention	50. 00
Exchange on membership dues of Canadian members	1. 35
Expenses of attendance, program committee meeting	46. 49
Purchase of \$1,000 Canadian bond	1, 001. 38
Expenses of attendance of secretary-treasurer at Buffalo meeting	16. 10
	<hr/>
	2, 630. 60
Cash in bank September 15, 1930	2, 294. 96
	<hr/>
	4, 925. 56

ASSETS

Cash in bank	\$2, 294. 96
Cash in postage fund	. 11
Securities:	
United States Liberty bonds	\$1, 700
Canadian bond	1, 000
Mortgage certificates, Paterson Mortgage & Title Guaranty Co	1, 500
	<hr/>
	4, 200. 00
	<hr/>
	6, 495. 07

² Of this check for \$5 for postage and telegraph fund, there is an amount of 11 cents unexpended at this time.

In addition to the assets enumerated above there are the following unpaid dues:

Idaho Industrial Accident Board, 1931.....	\$50. 00
Iowa Workmen's Compensation Service, 1931.....	50. 00
Kansas Commission of Labor and Industry, 1931.....	50. 00
Montana Industrial Accident Board, 1931.....	50. 00
Oklahoma State Industrial Commission, 1931.....	50. 00
	250. 00

The following securities are in safety deposit box R-154 National Savings & Trust Co., Washington, D. C.—Ethelbert Stewart:

United States Liberty bonds:

No. 1217874.....	\$100
No. 1217875.....	100
No. 236204.....	500
No. A-00031671.....	1, 000
Dominion of Canada bond No. 024880.....	1, 000
Paterson Mortgage & Title Guaranty Co. Certificate No. 6296, series 221, due October 19, 1930.....	1, 500
	4, 200

Respectfully submitted.

ETHELBERT STEWART, *Secretary-Treasurer.*

SEPTEMBER 15, 1930.

[The report of the secretary-treasurer was referred to the auditing committee.]

President STACK. We will now hear the report of the medical committee.

REPORT OF MEDICAL COMMITTEE

By G. H. GEHRMANN, M. D., *Chairman.*

Last year I was appointed chairman of the medical committee, and one of the specific duties of that committee was to formulate a curriculum which would be suitable to present to the medical colleges for the teaching of industrial medicine. In picking the members of this committee we tried to include men who were interested both from the educational standpoint and from the industrial standpoint, and I think we have them fairly well represented.

We realize that this is not exactly an easy task, that many others have made definite attempts to formulate such a curriculum and have met with varying degrees of success.

We also realize that there are practically two aspects to the subject. In the first place, there is the general lack of knowledge among all of our medical students, when they go out to practice medicine, along the lines of industrial diseases, and this probably is the first step we wish to take in acquainting them with some of the newer conditions which they are likely to meet with in the general practice of medicine. For instance, a great deal is taught them on all of the infectious diseases, such as typhoid fever, but little, if anything, is ever said on the subject of benzol poisoning or lead poisoning; and then again, there is a great demand for educational facilities for those men who wish to go into industrial medicine as a specialty, and at this day and age unquestionably industrial medicine is a specialty and should be gone into only after graduation and after a certain amount of practice in the field of general medicine.

We have been in contact with all of the members of our committee. I will not say that we have received as much cooperation from

all of them as we should like, but there seems to be a general consensus of opinion, especially among the educators, that the medical curriculum is already pretty well filled, and the question arises as to just how the teaching of industrial diseases is to be fitted in in such a way as not to interfere with any of the other subjects.

I have an expression of that kind from Dr. Robert Kehoe, of the University of Cincinnati. I have a similar expression from Doctor Rector, in Chicago.

I wrote to every member of the committee asking them for suggestions and an outline as a starting point for the formulating of this curriculum, and I received replies from some of the committee, some of which were useful, but the most valuable help we received was from our friend, Dr. Henry Field Smyth, of the University of Pennsylvania.

Dr. Smyth has been teaching industrial medicine and hygiene at the university for some time. He sent me the curriculum which he is using or was using at that time, and I sent it out to all members of the committee asking them for suggestions, additions, improvements, cancellations, etc., and I received practically a unanimous reply that they felt that Doctor Smyth's curriculum, both for student work and for postgraduate work, covered the field in a most admirable manner. Doctor Smyth has given us his curriculum, both for the undergraduate and for the postgraduate courses, and I am turning that over to the organization with the recommendation that it be adopted as the curriculum selected by your committee this year.

Also I have added to that a bibliography collected from all the medical literature, principally by Doctor Hayhurst, in Ohio. It deals with all the medical industrial literature which is available at the present time and the organizations in which industry would be interested.

Proposed Industrial Medical Courses in Medical Schools

PART 1.—A suggestive outline for the teaching of industrial medicine in medical schools

The course to cover one trimester consisting of one period a week; this to be included in the general curriculum and the purpose being to familiarize our medical students with industrial problems.

Discussions:

1. History, general development, statistics.
2. Personal factors: Age, sex, home, habits, nutrition, wages.
3. Welfare, sanitation.
4. Ventilation, light, temperature.
5. Hours, posture, tension, night work, fatigue.
6. Lead.
7. Mercury, arsenic, chrome, antimony, etc.
8. Coal-tar products, volatile solvents.
9. Gases, fumes, vapors.
10. Dusts.
11. Medical service.
12. Safety, fire.

Laboratory:

1. Dust, filter, Palmer, impinger: Three to four periods.
2. Ventilation: Fumes or smoke, anemometer, katathermometer, two to three periods.
3. CO: Two to three periods.
4. Light: One period.
5. Fumes: Two to three periods.

PART 2.—Suggested outline of a department of industrial hygiene for post-graduate students

This course to be three to six months of intensive training for those men who wish to go into industrial medicine as a specialty.

The department should cooperate with other university departments and be able to avail itself of their teaching facilities as follows:

1. Courses in practical hygiene, personal hygiene, preventive medicine and bacteriology.
2. Courses in sociology and statistics.
3. Courses in occupational disease, industrial surgery, and physiology.
4. Courses in heating, ventilating and lighting, water supplies, sewage and waste disposal.
5. Collaboration in chemical problems of research.
6. Nutrition and tuberculosis study.
7. Industrial dispensary.

Any or all of these courses should be available for special and advanced students and research workers.

Equipment: An adequate library of books and periodicals dealing with industrial hygiene and industrial medical subjects should be available, including special engineering and chemical journals, and some of the best of the industrial plant organs.

A liberal supply of museum exhibits, charts and lantern slides of industrial hygiene subjects and safety devices would be needed.

Contact with the National Safety Council, the National Conference Board of Physicians, and the National Association of Industrial Physicians and Surgeons should be provided for.

Courses to be offered:

To public-health students:

1. Practical hygiene laboratory work, as part of present course.
2. Industrial hygiene: 10 lectures first year; 15 field excursions and 15 seminar hours second year.

To industrial hygiene and industrial medicine students:

1. An intensive 2 months' course including lectures, laboratory work, and field surveys.
2. An intensive 2 months' course in industrial medicine given in the medical school.
3. Opportunity for 2 months' internship in a factory medical department.
4. Opportunity for 2 or more months devoted to a special research problem.

To senior medical students:

1. A 10 weeks' elective course in industrial hygiene.

To factory physicians, hygienists, and safety men:

1. Special intensive work to meet individual needs, including opportunity to study or assist in the study of specific problems in their industry.

Special training offered to investigators for State departments of labor, city and State health departments, and the United States Public Health Service.

Special lectures, financed and arranged for, to be given by speakers of national reputation on industrial hygiene, medical or surgical subjects and safety work; these to be free public lectures well advertised in industry.

Staff of department:

Professor of industrial hygiene.

Assistant professor of industrial hygiene and two instructors (at least one with chemical engineering training) to be shared with other departments of school hygiene.

Two research fellowships in industrial hygiene to study problems of chemical hazards, dustiness, sanitation, physiology, etc.

Services offered to outside agencies:

Group medical and hygiene service to special types of industries, as in the department-store service at Harvard University.

Consultation service to industrial firms.

Surveys of special hazards for city or State departments, the department to be affiliated with such departments.

The department to be officially represented at the following scientific meetings: National Safety Council; National Conference Board of Physicians; National Association of Industrial Physicians and Surgeons; American Public Health Association; American Medical Association.

The development of the foregoing program should be discussed by, and cooperated in by, a representative group of large-plant employers of labor in the district.

Industrial Hygiene—Current Literature and Organizations¹

By E. R. HAYHURST, M. D.

I. General reference works

- American Academy of Medicine, XXXIXth Annual Meeting, *Industrial Medicine*, 1915, 185 p. (Easton, Pa., Amer. Acad. Med. Press.)
- American Engineering Council, *Safety and Production*, 1928, 414 p. (Harper & Bros.)
- Cathcart, E. P., *Human Factor in Industry*, 1928, 105 p. (Oxford Univ. Press.)
- Clark, W. Irvin, *Health Service in Industry*, 1922, 168 p. (Macmillan.)
- Collis, Edgar L., *The Industrial Clinic*, 1920, 239 p. (Wood.)
- Collis and Greenwood, *Health of the Industrial Worker*, 1921, 450 p. (Blakiston.)
- Craig, Frank A., *Diseases of Middle Life*, Vol. I, pp. 83–174 (1923; 1927). (F. A. Davis Co.)
- Dana, R. T., and Ackerman, A. P., *The Human Machine in Industry*, 1927. (Codex Pub.)
- De Blois, Lewis A., *Industrial Safety Organization*, 1926, 328 p. (McGraw-Hill.)
- Dublin and Leiboff, *Occupational Hazards and Diagnostic Signs*, 1929, 31 p. (Metropolitan Life Insurance Co.; also Bul. 306, U. S. Bureau of Labor Statistics.)
- Federated American Engineering Society, *Waste in Industry*, 1921, 209 p. (McGraw-Hill.)
- Fisk, Eugene L., *Health Building and Life Extension*, 1923, 52 p. (Macmillan.)
- Frankel and Fleisher, *The Human Factor in Industry*, 1920, 366 p. (Macmillan.)
- Frankel and Bunzel, *The Health of the Worker*, 1924, 78 p. (Funk & Wagnalls Nat'l Hlth. Ser.)
- Hackett, J. D., *Health Maintenance in Industry*, 1925, 488 p. (Shaw.)
- Hayhurst, E. R., *Ohio Survey of Industrial Health-Hazards, etc.*, 1915, 434 p. (Ohio State Board of Health.)
- Henderson, Chas. R., *Citizens in Industry*, 1915, 342 p. (Appleton.)
- Hope, Hanna, and Stallybrass, *Industrial Hygiene and Medicine*, 1923, 766 p. (Wood.)
- Howell, Wm. H., *Health of the Worker*, 1924, 75 pp. (Funk & Wagnalls Nat'l Hlth. Ser.)
- International Labour Office (Geneva), *Occupation and Health*. Brochures began 1925.
- Kober and Hanson, *Diseases of Occupation and Vocational Hygiene*, 1916, 918 p. (Blakiston.)
- Kober and Hayhurst, *Industrial Health*, 1923, 1184 p. (Blakiston.)
- Lauck and Sydenstricker, *Conditions of Labor in American Industries*, 1917, 403 p. (Funk & Wagnalls.)
- Lockhart, Leonard P., *A Short Manual of Industrial Hygiene*, 1927, 114 p. (Murray.)
- Mock, Harry A., *Industrial Medicine and Surgery*, 1919, 785 p. (Sanders.)
- National Industrial Conference Board (Inc.), *New York, Industrial Relations Programs in Small Plants*, 1929, 60 p.
- *Medical Care of Industrial Workers*, 1926, 112 p.
- *Health Service in Industry*, 1921, 60 p. (Report No. 34.)
- *The Physician in Industry, A Symposium*, 1922, 98 p. (Special Report No. 22.)

¹ That is, literature and professional organizations devoted to the subject as a whole. There is a wealth of literature devoted to special problems or phases of the subject, such as fatigue, dusts, poisons, etc.

- Oliver, Sir Thomas, *Health of the Worker*, 1925, 266 p. (Faber and Gwayer Ltd., London.)
 — Diseases of Occupation, 1916, 476 p. (Dutton.)
 — Occupations from the Social, Hygienic and Medical Points of View, 1916, 110 p. (Cambridge University Press.)
 Park and Williams,² *Public Health and Hygiene* (special chapters), 2d ed., 1928. (Lea and Febriges.)
 Price, George M., *The Modern Factory*, 1914, 574 p. (Wiley.)
 Rosenau, Milton J.,² *Preventive Medicine and Hygiene*, especially Ch. XIV, 5th ed., 1927, etc. (Appleton.)
 Quinby, Robert S., *Manual of Health Supervision*, 1925. (American Manufacturing Association.)
 Scott, Walter D., *Increasing Human Efficiency in Business*, 1923, 364 p. (Macmillan.)
 Thompson, W. Gilman, *The Occupational Diseases*, 1916, 476 p. (Dutton.)
 Wilson, R. M., *The Care of Human Machinery*, 1920, 250 p. (Oxford Press.)
 XVth International Congress on Hygiene and Demography, Washington, 10 vols., 1912.
 Yale Medical School, *Contributions from the Department of Public Health*, annual vols., 1910 to date.

II. Periodicals

- American Journal of Public Health, American Public Health Association (abstract section on "Industrial Hygiene and Sanitation" began March, 1914). Monthly.
 Monthly Labor Review, U. S. Bureau of Labor Statistics (began 1915).
 Nation's Health (began 1919; combined with Amer. Jour. Pub. Hlth. Jan. 1928).
 Journal of Industrial Hygiene, Harvard School of Public Health (began May, 1919). Monthly.
 National Safety News, National Safety Council (began 1919). Monthly.
 The Industrial Doctor (702 Iroquois Bldg., Buffalo, N. Y.) (began Jan., 1923).
 Bulletin of Industrial Hygiene, New York State Department of Labor (began July, 1924).
 Bibliography of Industrial Hygiene, International Labour Office (Geneva) (began March, 1925). Quarterly.
 Bulletin of Hygiene, London Bureau of Hyg. & Trop. Med. (began 1926). Monthly.
 Bulletin, Amer. Ass'n of Ind. Physicians and Surgeons (began 1926). Quarterly.
 Safety Engineering, Safety Mag., Pub. Corp., New York. Monthly.

III. Bulletins and reports

- U. S. Department of Labor, bulletins. (The earliest one reporting upon industrial hygiene is Bulletin No. 44, Jan., 1903; then No. 75, 1908, etc., to date.)
 American Assn. for Labor Legislation, quarterly bulletins. (The first considering industrial hygiene in America appeared in 1910.)
 International Labour Office, Geneva, International Labour Review, monthly since 1920.
 Great Britain, Industrial Fatigue Research Board, bulletins, since 1918.
 — H. M. Inspector of Factories, annual and special reports, since 1900.
 U. S. Bureau of Mines, bulletins, circulars, technical papers, beginning about 1912.
 U. S. Public Health Service, public health bulletins. (First one on industrial hygiene is No. 71, August, 1915.)
 — Weekly reports (issued also as separate reprints). (The first one on industrial hygiene is May 29, 1914, Reprint No. 195.)
 National Safety Council, Proceedings of the annual congresses (from vol. 2, 1913, annually; also the first proceedings, 1912, contains an article on occupational diseases by Dr. John B. Andrews).

IV. General surveys of industrial hygiene in the United States

- Doehring, C. F. W. (student of Dr. George M. Kober), "Factory sanitation and Labor Protection (Washington)," in Bul. No. 44, U. S. Bureau of Labor, January, 1903.

² Other general reference works on hygiene and public health, both American and foreign, may also be consulted.

- Hanson, William C., "Health and Safety of Employees, etc.," in Annual Report, Mass. State Board of Health, 1905.
- Kober, George M., "Industrial and Personal Hygiene," Roosevelt's President's Homes Commission, Washington, 1908.
- Kober, George M., "Report of Commission on Social Betterment" (Wash.), 1908.
- Graham-Rogers, C. T., "Factory Investigations," in Annual Reports, New York State Department of Labor, 1908, 1909, etc.
- Illinois Commission on Occupational Diseases, Report, 1911 (Dr. Alice Hamilton, Director).
- New York State Factory Investigating Commission, Report, 12 vols., 1912-1914 (Dr. George M. Price, Director).
- Hayhurst, E. R., "Industrial Health Hazards and Occupational Diseases in Ohio," State Board of Health, 1915.

V. Professional organizations of national scope³ and dates of organization

- Section on Industrial Hygiene of the American Public Health Assn., 1914.
- Section on Industrial Hygiene (later Health Service) National Safety Council, 1914.
- Conference Board of Physicians in Industry (limited to physicians of corporations composing the National Industrial Conference Board), 1914.
- American Association of Industrial Physicians and Surgeons, 1916.
- Section on Preventive and Industrial Medicine and Public Health, American Medical Association, 1922 (formed from previous Section on Hygiene and Preventive Medicine, 1915).

In order to make our report more complete, I have asked Doctor Smyth to come here this afternoon and tell us about the operation of this curriculum, and he has very kindly consented to do so. I feel that we owe him a great deal because he has consented to allow us to use his curriculum as being a suitable one to present.

DISCUSSION

Doctor SMYTH (Pennsylvania). This is a subject in which I have been extremely interested for some years. I suppose I was one of the first in the country to plan and give a course of industrial hygiene which included field work in industry. I have been endeavoring to handle such a course since 1915 in the University of Pennsylvania, and our work has developed and enlarged.

As Doctor Gehrman told you, our average medical curriculum is already extremely crowded. It is very hard to get in any new work. There is not room, for instance, for intensive instruction in industrial hygiene and medicine for the undergraduate student, but we do feel at Pennsylvania that every undergraduate student should know something about the subject.

In our course in preventive medicine there are three or four lectures every year devoted to the question of industrial health, bringing out the opportunities and responsibilities of the industrial physician, the effect of work and working conditions on the health of the worker, the importance of bearing in mind occupation in taking the clinical histories, and not only present occupation but previous occupation, not only in what type of industry a man works but also what he does in that industry.

We discuss the common hazards of industry, chemical and physical, industrial poisonings, metallic poisonings, toxic vapors and

³There are several active State societies such as those of New York, New Jersey, New England, etc.

gases; also the question of hygienic conditions, light and heat, and ventilation as they affect working conditions, and the question of fatigue and posture, night work, and conditions of that kind.

As discussed in these lectures they must of necessity be rather superficial. We can touch only the high points because we do not have time to do anything else. We feel that that is just a beginning to interest the student in the possibilities of industrial medical work. We have in addition to that an elective course—a trimester course—during the fourth year for a student who thinks he would like to go into industrial medicine or like to know something more about it. This is in the form of informal discussion or seminar work, associated with some laboratory exercises in the study of industrial dust, industrial poisonings, light, ventilation—things of that character—elaborating on the work given to the third-year students in the course in preventive medicine.

We have been endeavoring to teach public health at Pennsylvania longer than any other university in the country, and since I have been actively interested in this subject, our public health course includes, of course, industrial hygiene. I have felt very strongly that industrial health is part of public health; that every public health officer should know something about industrial health. The average city and State health department pays a great deal of attention to the living conditions of the citizenry during their play hours and during their sleeping hours, but very little attention to the conditions under which they work, and I think that they should do so.

So we give this course in industrial hygiene to public health students and those taking parts of the public health course; that is a combined didactic course, lectures and field work. Every year we take those students into 15 or more large industrial plants which have associated with their work distinct health hazards. The students write reports on conditions as they find them on each excursion—and there are weekly excursions. Each student is assigned a particular subject on which to inform himself in that work—the medical service, the welfare work, heating and ventilation, lighting, and so forth—and the student who has to report on lighting reports on the lighting of the plants not as “good,” or “bad,” or “indifferent,” but in foot-candle illumination, and he takes a foot candle with him and measures it.

Those reports are criticized in seminar after the students have been through the plants. In that course I follow the plan of telling the student, as it were, what I am going to show him, then showing it to him, and then we discuss what he has seen. That is the only way you can impress anything like that on the student; one telling or one showing will not do the work.

I feel very strongly that this does not cover the field. Industrial medicine is a specialty. The proper training for industrial medicine can not be given by any medical school that I know of, of itself, unless it is associated with a university.

There must be other nonmedical subjects of which the industrial physician must have a grasp. He must have special training in vital statistics, some engineering training in building sanitation, in light and ventilation. He must have some insight into insurance practice, compensation insurance, welfare work, and sociology.

We have planned such a comprehensive, intensive course of instruction for men definitely in or going into industrial medicine. You can not make such a course cover a full year. You can not get students. They will not give the time nor spend the money after they have their medical degree; therefore, we plan an intensive course—a two months' intensive instruction course—in industrial hygiene and medicine, followed by an internship in a medical dispensary in a large industrial plant, where the student will be under the direction of a competent industrial physician; where he will take up during that internship of at least a month—more if he can spend the time—some particular problem related to that industry, and study it and make such reports to us on his studies (equivalent to a short hospital internship) as we require of our graduate students for a Ph. D. or master's degree—progress reports. These students will carry out their research in the industry itself.

This course is as yet on paper; part of the course, but not the full course, was given during the war, and my experience at that time leads me to believe that the best way to get a course of this kind started is to have industry want it—demand it—and to have industry say that it will select its new medical staff from specially trained men who have had postgraduate instruction in industrial medicine and hygiene. It can not get them; they are not available. How, then, will it get them? By doing as at least one industry has with me, employing a young man of promise and allowing him time, paying his tuition fee for part-time instruction—intensive instruction—in industrial medicine and hygiene and the allied subjects which an industrial physician must know.

That is the suggestion I make to industry, to ask for specially trained men and to make it possible for the young man to get such training after he is in the employ of industry. Until the desire among students for such training is built up, we will not have it in any great quantity. That has been done, and it is the only way that industry can insure itself of getting the right type of men without making a good many mistakes and false starts in picking their men.

I should like to say a word or two in addition as to the instruction of the undergraduate. You should request the medical and surgical staffs of the universities to stress industry in their teaching of medicine and surgery, as the Association of Traumatic Surgeons has asked them to stress traumatic surgery. You should ask them to stress industrial medicine.

At the University of Pennsylvania, our professor of medicine, Doctor Stengle, and our professor of clinical medicine, Doctor Riesman, are both definitely interested in industrial medicine and are alive to those facts, and I know both make a point of pointing out, wherever they can, the relation of industry to disease in their lecture courses and in their clinics in the demonstrating cases. They are only too glad to get hold of industrial cases so as to stress that point. I think, if you make any approach to medical schools in general, you should make that request of both the medical and surgical staff, and take pains, whenever an industrial phase of a medical or surgical case is at all prominent, to see that it is stressed and emphasized.

President STACK. Doctor Gehrman, this, then, is your report. What is the pleasure of the convention?

Secretary STEWART. I should like to ask Doctor Gehrman if this report of the committee's work last year is the final report.

Doctor GEHRMANN. I should say this is a tentative report for the year, Mr. Stewart, and, of course, as time goes on there will be a lot more to add to it, but we have nothing to add right now.

Secretary STEWART. It seems to me that the association should accept the report and advise the secretary to furnish it to those universities which year before last asked for a specific curriculum, and any others which may be able to handle it in any way.

[The motion was seconded and carried.]

[The reading of the report of the committee on statistics and compensation insurance costs was laid over until Wednesday afternoon.]

Secretary STEWART. There is the committee on safety and the committee on investigation of results of compensation awards. The report of the latter is that a schedule was furnished to the various States as a basis for their follow-up work and they were to report results to the secretary of the association. Not a single report has been received from any State.

[Mr. Duxbury made a motion, which was seconded by Mr. Parks, that a special vote of thanks and appreciation be extended by the association to Doctor Smyth for coming to the meeting and for his excellent report.]

Mr. PARKS. I was going to say something when Doctor Smyth finished, but I thought we had other business. It appears that perhaps we can discuss some of these things. I think the paper is the most interesting one I have listened to in some time.

I have been helping to administer the compensation act of Massachusetts for 18 years, perhaps longer than any man here has served, and we are just beginning to get the benefit of good industrial surgeons, but we have had to pay the price for it. Since 1912 and up to a few years back we have had to pay the price because of inexperienced doctors getting hold of these poor cripples of industry. It is high time the medical colleges throughout the United States take notice of this subject and get to the point where they do not turn out young medical students like those to whom I have listened so many, many times. It is pitiful to hear how little they know about industrial surgery.

They have come before me and testified. I have asked them to come in in the afternoon so that I might give them something of my knowledge of industrial surgery, and I have had the pleasure of teaching some of the students, some of the medical men, men with M. D.'s, something of what I call the science of industrial surgery.

In Nova Scotia I had the pleasure of reading a paper on rehabilitation and since that time I have been invited to various places. I have delivered two lectures at two medical colleges. The students sat there with their eyes and ears wide open, and the doctor who invited me to Tufts Medical School told me that from what the

students said, he thought it was the best thing they had ever had there, and that they ought to have more of such lectures.

Doctor Smyth has told us that the curriculums of the medical schools of the United States are so filled that there is no room for this big subject of industrial surgery. The colleges ought to make room for it and cut out some of the fads and fancies they are teaching these boys, which have no place in the practice of practical medicine and practical industrial surgery. They ought to make room for it. That is what we ought to agitate for here.

This association has a right to demand of the medical profession in the United States something beside the presentation of bills. Its members are very prompt in presenting bills, which have to be scrutinized very carefully to see that they are not padded and overloaded, but when it comes to asking them what they did for the patient, what knowledge they have of industrial surgery, that is another matter entirely.

The doctors seem to have a very vague idea of what it all means. For instance, a man has a fractured leg or a fractured arm and the doctor makes a report to the insurance company. "This man is entirely well. I discharged him to-day. He is now able to work."

I have the doctor come before me and I say, "By the way, Doctor, what does this man do? What is his work?"

"I don't know."

"Do you know he has to make a certain movement with that leg that was fractured?"

"No. I never thought of that."

"You meant, when you said he was able to work, that the leg is as good as it ever will be?"

"It has knitted together. There is callus formation. It is as good as medical science can make it. That is as far as I can go."

"Then you are not interested in what movement he has to make with that leg?"

"Why, no, of course not."

As a practical proposition, the man is not able to work, even though the doctor is all through with him, but the doctor does not know it. A man who has a broken leg may be a hod carrier and have to climb ladders with a couple hundred pounds of bricks on his shoulder. You ask the doctor if he knows that.

"Why, no, I never thought of that."

"Is that leg fit to go up that ladder?"

"Well, I don't think it would be."

"Yes, but you said he was able to work."

"I know I did. I guess I was wrong."

That is the side to which they are not being educated, and it is the same way with the lawyers. I am going to propose sometime, if it is appropriate, that our legal profession take up the study of the workmen's compensation laws in the colleges of this country. Perhaps that is a little foreign to this discussion, but it is on the same subject.

I do not know how frequently lawyers are necessary in other States, but in Massachusetts men often have to have lawyers to meet the skill of the professional lawyer brought in by the insurance

company and if a man hasn't a good lawyer he loses, many times, because of the lack of knowledge of the young lawyer, who never heard of the compensation act until he comes into the room and begs the commissioner's pardon and hopes the commissioner will excuse him if he makes any bad breaks. There may be a widow and four or five little children depending on his knowledge of the workmen's compensation law, but he wants to be excused because he knows nothing about the law, though there is a skilled insurance lawyer on the other side, ready to knock him out. The commissioner has to act as judge and lawyer in order to protect the widow and children, because the lawyer never heard of the compensation act.

They tell us in Massachusetts that there is no room for this subject in the curriculum of the law school, that it is full, and yet weeks and weeks are spent in talks on the subject of the employers' liability law, which is obsolete in Massachusetts; it does not apply because we have a compensation act, but the students go on studying it. The colleges go on teaching the boys the employers' liability act, spending weeks and weeks on it, instead of teaching them the compensation act. They just touch on the latter subject incidentally in their other talks.

There is only one law school, if you please, which teaches students the workmen's compensation act, and I happen to be the professor who does it. It is the Suffolk Law School, and I think I teach the compensation act so that the students should know it; we do not have nearly enough lectures, but I give it as much emphasis as I can.

We ought to insist, and have a right to insist, in this matter. The compensation act is putting millions and millions of dollars into the pockets of the medical profession in the United States—I know that in Massachusetts it is putting millions of dollars into their pockets—and they should at least give us some return for it.

This is not an indictment of the medical profession. Doctors are what they have been taught to be, and in Massachusetts I guess we have as high-standard doctors as there are in the United States, just as good as those of any other State, but they do not go into this subject of industrial medicine as they should, and we ought to insist that they do.

Doctor Gehrman is to be congratulated on his report. I think this is one of the biggest subjects we have here; there is none bigger. It is all right to talk about safety. That, of course, will prevent the accident—we will not have the accident at all if we can save the man. Stop the accident, that is the big thing; but once the accident has happened, then we want to make the poor fellow well so that he can earn his living, and who will help us to do it? The medical profession. How can doctors do this if they do not train themselves for it?

I hope the secretary will push the thing and let the medical schools of the United States hear from us that we want this subject taught in the schools.

Doctor SMYTH. It will be taught.

Secretary STEWART. Mr. Parks suggested a matter that ought, perhaps, to be emphasized. The medical schools say that their curriculums are full. After all, it is a question of values. There

is such a thing as revision and elimination, sometimes, of a dead issue as well as dead tissue. I wonder if the medical colleges of the United States realize, or whether it would make any difference to them to know that through the workmen's compensation commissions of the United States we pay the physicians and the hospitals \$72,000,000 every year. That is worth going after intelligently, Doctor Gehrmann, and perhaps if a situation could be created in which they could not get this unless they did go after it intelligently, room would be found in some of the curriculums for this subject.

I was very much impressed with Doctor Smyth's statement outlining what they are doing to train plant physicians. There is no question but that we need plant physicians. The demand for them is very great, and there is no prospect of its being supplied in the very near future. What we need more than that is the common, everyday doctor who knows enough not to cut a man open for appendicitis when he has painter's colic.

I have never had a doctor ask me what my occupation was. I wonder if you ever had a doctor ask you that question. The fact is established that not one doctor in 50—I think I could go to 95, but I will say one doctor in 50—ever thinks, when he is called in on a case, that what that man was doing or what that woman or girl was doing may have something to do with his or her condition. The doctor does not even ask the patient what his occupation is, and would not know what it meant if he did.

That is what we want to get at, Doctor Smyth. I am not discounting in the least the value of plant physicians, but it is very much more important from our point of view, particularly along the lines of occupational diseases, that the ordinary physicians whom these people are going to call in when they get sick know that the disease is an occupational question and can bring it to the attention of our compensation boards or the employer and maybe prevent something serious.

Take, for instance, radium. People—women and children—are dying now who haven't worked in a radium factory for eight or nine years. It is in those long, insidious diseases that we want the doctor sufficiently alert so that he can see them coming on.

The Bureau of Labor Statistics made an investigation into what was commonly or vulgarly called phossy jaw—phosphorus necrosis. The workers in match factories found the material with which they worked was attacking their teeth, and in the town where the biggest match factory in the United States was located dentist after dentist reported, "Yes, I pulled that girl's tooth, and her jaw broke and we had an awful time. Mighty hard luck!"

"Did you suspect phossy jaw in the case?"

"What the devil is that?"

"Well, we mean phosphorus necrosis."

"Oh, the devil. I pull teeth."

Yes, and break jaws and things like that. I am wondering how much the medical schools are willing to do for \$72,000,000.

Mr. McSHANE. I want to make one small comment, to keep the record straight. This \$72,000,000 which is paid annually to the

physicians and surgeons of the United States is paid out for industrial accidents as well as for occupational diseases.

Secretary STEWART. That is true.

Mr. McSHANE. I understood the Doctor's report to state that the colleges of the United States were being asked to put in occupational-disease training. They have industrial surgery. A broken arm is a broken arm wherever it may happen, and inasmuch as the occupational diseases that come before the various commissions for treatment amount to only about 2 per cent of the total of all the cases coming before them, a considerable portion of that \$72,000,000 can be discounted.

The 2 per cent relates to the States which have occupational disease laws, and only two in the United States have any that are worth anything. Those that have schedules do not amount to anything.

President STACK. Doctor Smyth, are all the medical schools today requiring a bachelor's degree of the students before matriculation?

Doctor SMYTH. We are; I do not know whether they all are yet.

President STACK. It has occurred to me that it might be well to drop one year from premedical work and add one to the medical course without adding any unnecessary expense to the medical student. What is your opinion of that?

Doctor SMYTH. I think, as far as the training of the undergraduate goes, it is possible to get that if you insist upon it, as the Association of Traumatic Surgeons is insisting that the medical colleges pay more attention to just the things you want them to. Traumatic surgery is what you want. That does not mean there must be given a new course in surgery, but that the surgeon must stress traumatic surgery more than he has been doing. In the same way, in industrial medicine the clinician can in the course now given stress industrial medicine more than he does. It is only when organizations such as yours demand it that that can be done.

As a teacher in a medical school, I would welcome any pressure you might bring to bear, and what I had to say about courses in industrial medicine and hygiene includes training in industrial surgery as well as medicine, and the question of industrial health, which includes accidents as well as disease.

This subject is to come before the National Safety Council at its annual meeting next week, in a symposium on the qualifications of the industrial surgeon, and I am to fire the opening gun from the standpoint of an educator, so I am just getting ready, as it were, to-day, for that talk next week. But this subject is coming more and more to the fore, and I think if that organization and this organization demand better teaching of industrial medicine and industrial surgery, there will be better teaching of industrial medicine and surgery to the undergraduate, though not with the idea of making every man an industrial surgeon or physician.

I am interested in both points of view. I realize, as your secretary-treasurer says, that the average general practitioner does not know one thing about industrial medicine. He may say, as I have known him to say time and time again to a man, "Where do you work?" if he is interested at all in occupation. "For the John T. Lewis Co.,"

may be the reply. The man has a pain, for he has lead poisoning, but the doctor does not know what the man does for the John T. Lewis Co. at all.

We have done something in a spray painting survey for the National Safety Council. You will have to listen to me talk about that before the week is over. I have in mind a man in the western part of a particular State who gave a distinct benzol poisoning picture in his blood. He was handling a lacquer with benzol, but only a small quantity and not full time; in taking his history I found he had been doing this only six months, but three years before that he had been working in a rubber factory handling rubber cement containing 50 per cent or more benzol.

I went over that point with the student, stressing the point of finding out, not just where the man works, but also what he does. I insist that the man serving industry is not serving industry properly unless he knows the job of every man who comes before him.

The industrial surgeon who goes to the plant an hour or two a day and sees the cases that the safety man refers to him often is not worth his salt unless he knows what the man is doing.

Mr. DUXBURY. I am a little surprised that my motion created the debate it has, but it has been very instructive.

President STACK. I knew that it would.

Mr. DUXBURY. I want to say one thing further with reference to the subject discussed—one particular thing which experience indicates to me—that even when the surgeon is one of the highest standing and in the front rank of the profession, and has done everything medical science and skill can do, the industrial board is interested in knowing what is the per cent of loss of use of a member, or something of that kind, but that is something he has never thought about. That is a matter of judgment in relation to conditions to which he has never had occasion to give any thought. It is not unusual, I think, in the experience of everyone, that with two men of equal standing and skill and the highest class surgeons—men who know how to cure the patient—on this question which calls for professional judgment on the per cent of loss of use, they vary so widely that you wonder whether either one of them has any faculty of judgment at all.

It is of practical importance to know whether the man has lost 50 per cent of the use of the member, or 10 per cent, or 75 per cent, and we laymen in the subject get so we think we have more judgment in the matter than some of those skillful physicians, because they have not had occasion to think in those terms and have no judgment in the matter. It is, after all, a mere matter of judgment and judgments will differ. There are no tables that I know of by which you can figure out this matter as you can interest with interest tables. It is a matter of judgment, but it would be helpful to industrial boards and commissions and those who are called upon to determine that, if they could have the judgment of a man who knows all the anatomical conditions involved and has given some consideration to the subject of what is the per cent of loss of use.

I was impressed by that, as I think many of the rest of you were, at the clinic, at the Buffalo meeting, where, after giving all the

history and facts of the cases, it was announced what the determined percentage of loss of use was. Take an ankylosed knee, for instance. It was rather interesting, if not a matter of regret, that the judgment of men who were engaged in determining that question varied quite materially as to what the percentage of loss of use of the leg amounted to when the patient had an ankylosed knee. That is a definite condition, but the percentage varied from something like 30 to 70. I do not know what is exactly right.

Secretary STEWART. I am wondering if we are not loading this question too much. After all, is that a question for the physician to decide?

Mr. DUXBURY. No.

Secretary STEWART. I do not think we should inject this into the question. If the physicians will give us 100 per cent inside of their sphere, I think we are making a mistake in asking them to go beyond their sphere.

Mr. DUXBURY. I might say that it is not for the physician to decide, and we certainly should understand that. The physician who knows all these facts certainly should qualify as an expert to express his opinion, but he does not decide the case. The commission has the responsibility to decide what is right, and when one of the commissioners says 20 per cent, for instance, and another says 70 per cent, naturally you conclude that one or the other was wrong and possibly both. The commission has the responsibility of, shall I say, "making the guess," or, probably better than that, of "making the judgment" of what that actually is, sometimes without the information which we really ought to have; if we had the information we really ought to have, it would help our guess—I mean our judgment.

Mr. JONES (Delaware). It just occurs to me, in discussing this subject of industrial surgeons, that I can not see that there is any particular difference. I can not understand why there should be any different treatment for a fractured leg occurring as a result of an industrial accident than if that fractured leg occurred in an automobile accident to a man riding for pleasure. The same thing applies to a broken arm or to mashed fingers in an automobile door. I can not see that in industrial surgery the treatment should be any different than if the injury was sustained in falling downstairs in the house or sustaining injury in an automobile accident.

Fractures are treated according to instructions given in medical schools. When you come to industrial medicine, it is another story. There are diseases which come about as the result of using certain materials in certain occupations, but as far as industrial surgery goes, I think the same methods of surgery are employed in industrial accidents as in accidents outside industrial plants, so it would seem to me we are concerned mainly with industrial medicine rather than industrial surgery.

Mr. WILCOX (Wisconsin). I have been interested in this discussion. This last June, just before the close of the school year, Dr. Alice Hamilton, of Harvard, was at Madison, and by invitation of the medical school she talked to the student body and the instructors and professors. Our dean of the medical school was there. She discussed this matter of industrial medicine, and she reminded that

group that it is becoming more and more important every year, because of the increasing use of chemicals in industry and the growing degree of occupational diseases. She urged upon the medical school there the obligation to equip these young men and women who were going out in institutions in this field.

She used this illustration, and it interested me a bit when Doctor Gehrman used the same types of diseases. She said, "I do not know just what your curriculum provides for here in this institution, but I assume it is much like it is in other medical schools of the country. If so, you will devote a lot of attention to equipping these men and women so that they may know the symptoms which accompany typhoid fever, how to diagnose that disease, how to treat it, how to judge of what the ultimate result is likely to be, and the hangover of disabilities. Now, whether you will or will not, students are likely to find a very much larger number of cases [I think she said that out of every 10 cases you will find 9 cases] of benzol poisoning to 1 case of typhoid fever than they will be called upon to meet in their practice, probably 9 cases of benzol poisoning to 1 case of typhoid fever, and it is a pity that an institution should neglect to teach the student body how to detect the former."

Doctor Hamilton said there should be an inquiry, when people come for treatment, as to what the occupation is, and then a tracing back before undertaking to spot the disease, so that one might know exactly the conditions under which the patient was working. She was talking to our dean, the head of the institution, and others. She said good judgment ought to dictate to those at the head of the institution that if they must forego the teaching either of how to diagnose typhoid fever and how to treat it or the subject of benzol poisoning, they put in the time on benzol poisoning. I think that illustrates the fact that curriculums ought not to be too full for the teaching of this subject, especially in those States which do not have full coverage of occupational diseases under their laws.

In Wisconsin we learned to give attention to safety when we got workmen's compensation, and the fact that these occupational diseases are compensable is stirring up our people to be sure that the disease is not an occupational disease; but it is a pitiful thing, when you come to handling a case which, after some months or years, is finally determined to be an occupational disease and find that back in the early stages the doctors were treating the man for something he did not have, having failed to recognize the thing that he did have. We had a case of typhoid fever, contracted in a road camp, where the man drifted away from the camp and back to his home at Rice Lake, and there infected his entire family, resulting in two deaths in the family, and the doctor in attendance did not even discover it was typhoid fever.

We get a good many cases where the real cause of the man's disability has not been discovered, and better equipment will make it possible to do that thing. In the matter of traumatic surgery, we have been interested in the development of a rule or schedule by which to rate certain types of disability, as the ankylosed knee of which Mr. Duxbury spoke.

We were interested to find that many surgeons had given no attention to the most desirable position in which to put a limb; for ex-

ample, a fracture into the elbow, the doctor determining it to be of such a nature that, considering the nature of the industry, there is not going to be any loss of rotary motion. What is the proper position to put it in? You would be surprised if I were to tell you that those positions varied very materially. Doctor Smyth and Doctor Gehrman will appreciate that they probably could not agree because they hadn't had all the instruction they needed as to how to set the limb up to make it most useful in service. That field, as to the proper position in which to set up the fractured limb to make it as useful as possible, ought at least to be given consideration in schools.

I should like to say that Dr. Alice Hamilton is with the Harvard Medical School. I am told her work is wholly with the graduate student, and Doctor Hayhurst, whom Doctor Gehrman mentioned, is with the Ohio State and I think works with the graduate students there. They are devoting much attention to this field; in fact, they are devoting their entire attention in the universities to this particular subject.

Mr. PARKS. I do not quite agree, strange as it might seem, with my friend, Mr. McShane, and my brother in the rear, that a broken arm is a broken arm no matter who gets it and that all of them are put up the same way per se. Doctor Wilcox said the doctors differ in the way they put them up.

I will say this to you: If a man who fell down stairs and broke his arm was an attorney and did not make any special use of his arm, he might be able to throw it around when he was talking, as I do once in a while, and the doctors might not have to be so fussy with it, as if the man were a mechanic who had to use that shoulder for a certain specific movement. They might give him different surgical treatment to bring it around so that it would be an industrial asset; in other words, there are occupations where a man does not have to be adept at using his arm or make those skillful movements, but if the doctor knew what the man did, he would say, "Look out! Don't do that to that arm. That man is a mechanic. He has to make certain movements with that arm and he must be treated a little differently than that other fellow."

It isn't, of course, all industrial surgery—the breaking of arms and legs. In Massachusetts we have an act which brings in all kinds of occupational disease, but not specifically as such. It says "on every personal injury." We meet these diseases every day and, as has been said, the doctors pass them up like the phossy jaw case.

We never heard of pneumoconiosis until Sullivan's case was decided in Massachusetts within the last two years. A stonecutter fell sick three or four years ago or a little before that, and the ordinary doctor who had graduated from our medical schools diagnosed the case as bronchitis, and treated it as such; pretty soon they found crêpe on the door and he was buried, and nobody knew what he had had. Since the decision in Sullivan's case and the finding that pneumoconiosis is an injury within the compensation act, we are finding a great many pneumoconioses, and they are real cases where an X ray of the man's lungs shows them to be a mass of stone dust. There is no question about it; you can see it

in the X-ray picture. There is no possible doubt about it, but these men were passing such cases up.

Now what is happening? They are being treated and being sent to experts; we have perhaps half a dozen, and we send them to those men to examine them, to help us; we have sent cases to Dr. Alice Hamilton. We are meeting that class of case, never known before, every day, and yet such cases must have been going on for generations and people were dying from these diseases, and were treated by these men from the same medical universities who did not know what they were treating.

This resolution isn't merely on broken arms and legs; it is for the treatment of the human body and making the man well, and on teaching these men in the medical school the science of medicine, real medicine, surgery and hygiene, as the doctor says, and all that goes with it.

Mr. MORLEY (Ontario.) Some two or three years ago at a meeting I had occasion, not being a young man, to defend the youth of the land against an attack levied against them. To-day, not being a doctor, it is perhaps to the point that I should call to your attention the fact that the doctors are doing an immense amount of good; that the doctors are, like the rest of us, learning something as they go along; that possibly Doctor Hamilton's case of nine to one was not right at all, because perhaps (and I don't know) one case of typhoid may be more serious than nine cases of benzol poisoning.

As Mr. Wilcox says, there has to be a proper balance between these things and then he goes ahead and tells us of a doctor who could not diagnose a case of typhoid. I think, if I may suggest, as a layman who has known a number of good doctors and a number also who did not know anything at all about diagnosis, that possibly Mr. Parks's earlier suggestion of helping the doctors along with suggestions as to what to do would get the organization and the community further perhaps than some of the (if I may suggest so) indiscriminate criticism to which we have listened this afternoon.

Secretary STEWART. I should like to suggest that when we get this report at Washington and have it printed, the constituent members of this association do not depend upon the secretary to circularize all these colleges. I am going to send the report, of course, to all of them. Probably three-fourths of those reports will go into the wastebasket unopened though they will be accompanied by letters. You can do more in your State with your local institutions—50 per cent, yes, 75 per cent more—than the secretary of the association could do acting for the association and I should like to have some understanding or some agreement that this thing isn't going to fall flat now, isn't going to die with the printing of this report and the sending of the proceedings or a separate copy of this report to the various schools.

If we mean what we say, if you meant what you said when you instructed me to get in touch with the medical colleges of the United States along this line, then, do you mean it sufficiently to go after the medical colleges in your own State, such as the State institution, yourselves? Otherwise, I haven't very much hope of the future.

President STACK. It seems to the Chair there is one way of approaching this subject, which would be for this association to go directly to the budget commissions of the various States, and tell these budget commissions what we want, and ask them if they will not insist on the medical colleges doing something.

As I suggested a moment ago to Doctor Smyth, this may not be practical, but certainly it would not cost the medical student any more money if he could drop a year off the premedical years, cut off the fourth year, and add a year to his medical years. He would have only eight years of expense and time in getting his medical degree, but the fifth year would be in medicine, and it would enable him to pick up a lot that he is not getting to-day.

Dr. SMYTH. Many of our men now get their two degrees in seven years, getting their bachelor's degree at the end of the premedical course.

I think you can get a good deal more instruction in these branches, without much enlargement of the curriculum, by simply impressing upon the colleges the advisability and necessity of stressing industry, of making both the medical and surgical teaching staff industrially minded in their work, so that they will take every opportunity to emphasize the question of the effect of work on health from the medical side and the surgical side, emphasizing the importance of proper restoration of function. Many a surgeon to-day is satisfied if he gets good union and a fairly good-looking scar. He should with all cases pay more attention to restoration of function, bearing in mind what function will be demanded of the limb, but as a rule, doctors do not do that in general surgery as much as they should. They should stress that more in traumatic surgery. The one thing which the Association of Traumatic Surgeons is trying to stress most is that very matter of considering the wounded member from the standpoint of what that member will have to do after it gets well.

If the medical staff and the surgical staff stress the importance of that subject and if in the course of preventive medicine you include, as you can and as we do, instruction in industrial health hazards, I think your request will be answered, and men will be turned out who really know something about industry in its relation to health.

Mr. McSHANE. Just one word. It is so easy to disagree with people that I do not want to be placed in the position of disagreeing with a person when I don't. I do not disagree with Doctor Parks, of Massachusetts. What I meant to convey is, that I think the medical schools are giving consideration to every element of surgery in industry, and I know that in my own State, and I think it is true in every State in the Union, there isn't a surgeon who is not ashamed to turn out a man without full restoration, if that is possible.

Dr. SMYTH. No doubt that is probably so more than it used to be and the recent graduate understands that more than formerly, but many practitioners of to-day who graduated five or more years ago do not know what they should about those things. It is only comparatively recently that the surgeons and the medical staff as well have waked up to the importance of this factor and many of them are still asleep.

Mr. McSHANE. That is my point.

[A rising vote of thanks was given Doctor Smyth for his talk.]

Mr. WILCOX. It seems to me as though we are leaving the question of this report up in the air. I move that the secretary, with the aid of the committee, get this report into shape for presentation by the compensation departments of the various States to the medical schools within that State, and that they be furnished to us at the earliest possible moment so that we may take it up directly with the schools.

I have to disagree with you, Doctor Stack, that you are in a position to do this from a distance. I know the man in my State with whom I shall have to deal; I am not presuming. I am quite sure that a commissioner in any one of these States can get further with his own medical schools and the help of the employers of his State than you can get from a distance, or than the association can. So I move that that be done.

President STACK. This committee, of which Doctor Gehrman is chairman, is a regular standing committee.

Secretary STEWART. That changes this year. It need not change, but ordinarily it would change.

President STACK. Probably it will not change at this time, and I think Doctor Gehrman will continue as chairman of the committee.

Secretary STEWART. At the same time, I like Mr. Wilcox's motion. As a matter of fact, a communication loses effect when sent out from Washington. We haven't any vote in your State or in our own; we do not vote anywhere. We send something out from the Government Printing Office in Washington, and I won't quote what the recipient says as he throws it in the wastebasket. There is no question about it. It is true, I know it. You do it yourselves. I don't believe you even open my letters, most of you. The communication will have infinitely more effect if it comes from within the State in which that school is located.

[Mr. Wilcox's motion was seconded.]

President STACK. That is why I said a moment ago that I thought the short way would be to approach the thing through budgets. I had in mind the budget committee of the States in which are located medical colleges.

Mr. PARKS. I do not know what you mean by the budget commission of the State.

President STACK. Doesn't the State of Massachusetts make any appropriations to your medical colleges?

Mr. PARKS. No; none whatever.

President STACK. Is that true in Pennsylvania?

Dr. SMYTH. Yes; it does appropriate some money. It is not a fully State supported institution, but almost every legislature does make special grants to the universities. There is no continuing grant.

[The motion was carried.]

[Meeting adjourned.]

TUESDAY, SEPTEMBER 23—MORNING SESSION

Chairman, Fred W. Armstrong, vice chairman Workmen's Compensation Board of Nova Scotia

Chairman ARMSTRONG. The first matter before the meeting this morning will be a discussion on Separate Interstate and Intrastate Cases, by Mr. Fred M. Wilcox, chairman of the Industrial Commission of Wisconsin.

Separate Interstate and Intrastate Cases

By FRED M. WILCOX, *chairman Industrial Commission of Wisconsin*

It is not difficult to distinguish interstate from intrastate commerce. The very words themselves tell us what the distinction is. Intrastate commerce is commerce wholly within the State. Interstate commerce is commerce from a point within the State to a point without the State, or vice versa, or through other States, even to the point where transportation out of one State through the borders of another State and back again into the first State is necessary in order to make the terminals which are wholly within the first State.

To define clearly the difference between interstate and intrastate commerce, however, is not the problem in the administration of compensation laws; because the particular thing that is being done by a railroad at the time may be in the interest both of interstate and of intrastate commerce. This, as a matter of fact, is usually the case, and is the type of case in which difficulties arise.

The United States Government has its powers as a grant from the States—only the powers that the States have given to it. The powers of the State are the reserved powers—those that they have not given away. Therein lies the reason for more trouble. If the Federal employers' liability act had not been passed before the days of workmen's compensation, there would, perhaps, be more confusion than there now is.

Although in the Constitution the United States Government was given the right to regulate commerce among the several States, the States reserved that right so long as Congress did not act, and continued to do so until 1908 when the first Federal employers' liability act was passed. In all that time railroad employees had their remedies, if any, solely under the provisions of the liability laws of the individual States.

The States had sufficient power to pass employers' liability laws, which they did, and under these laws railroad employees obtained any benefits they received. When Congress made use of the power granted to it and enacted the Federal employers' liability law the States immediately lost their power in such cases.

Then again confusion arose. The first Federal employers' liability act undertook to take jurisdiction of all railway employees if the railway itself was engaged in interstate commerce. In my discussion of this subject, I want you to bear in mind that almost without

exception all railways are engaged in interstate commerce. To be engaged in interstate commerce, it is not necessary for a railway actually to continue its lines from a point in one State to one in another State. Railway companies have their through tariff schedules and their through billing service from railway to railway. When you want to ship something from some line in your State, you take it to the depot and bill it straight through—you don't have to send it to Chicago and then go there to rebill and transfer it yourself. The railways handle the shipment to the point where it is to be delivered, and that is interstate commerce just as much as if the railway's line continued over into another State.

The first Federal act, as I say, undertook to assume jurisdiction over liability to every railway employee where the railway was engaged in interstate commerce, whether or not the employee or the railway at the particular time—as regards the thing being done and in which the man was injured—was engaged in interstate commerce.

It took a decision of the United States Supreme Court ("First Employers' Liability Cases" is the title by which these cases are known) finally to determine for us that the Federal Government had no control over that employee or his rights of recovery or over the limiting of his right of recovery, when neither the employee himself nor the railway was engaged in interstate commerce at the time the particular thing was being done. Not only the railway company but the employee himself must at the time have been engaged in some act of interstate commerce; otherwise the Federal Government had no right.

So, in 1910 a second act was passed, which provided a remedy for all railway employees where the employer was engaged in interstate commerce and the employee was at the time engaged in interstate commerce. The scope of this act was limited to that type of case, and in the Second Employers' Liability Cases the United States Supreme Court upheld the validity of the act. There have been some amendments since, but in our consideration this morning they are not so important.

Our difficulties arise in determining whether or not at the precise time of the injury the employee was engaged in interstate commerce. One can not read the provisions of the various State compensation acts, as I have in these last weeks, without feeling that the various legislatures suffered from brainstorms at the time the provisions were written. They betray a thorough lack of appreciation of constitutional law and of an effort really to help compensation boards to know what they are expected to do and also to aid the courts to know what they are expected to do under certain cases.

Some of the States have met the issue squarely and said exactly what they intended to say—at least one may read the act and agree that the legislature knew what it wanted to say and said it. There have, however, been attorneys and claimants, now and then, who have tried to read into the law things that were not there and were never intended to be there.

Minnesota and several other States have specifically declared that no person employed by a common carrier—by a railroad—shall be within the benefits of their laws. I think I am right in saying—Senator Duxbury will know if I am not—that even in Minnesota

it was contended that a railway employee who at the time was engaged in intrastate commerce came within the benefits of its compensation act, but it was held otherwise.

Nebraska, at the time its act was adopted, tried to write into it the provision that the benefits should be extended to persons engaged in intrastate commerce at the time of the injury, but the legislature turned down the provision. Afterwards there was a very determined effort to have the courts of that State hold that notwithstanding the employee was injured in intrastate commerce, he was within the benefits of that law, but the supreme court promptly and properly said that the record of the adoption of this law indicated very clearly that it was never intended to bring any of the railway employees under the compensation act. The State had an opportunity to do that and was asked to do it, but turned it down, and it can not now ask the court to read into the law that because an employee engaged in interstate commerce had an injury in intrastate commerce that employee ought to come within the benefits of the law. If the State desires that, it will have to be written into the law.

Kansas, clearly and definitely, has said that it intends to recognize the authority of Congress to take care of the employees injured in interstate commerce, and what it wants to do is take care of the other group, the employees engaged in intrastate commerce. For the most part the act does take care of that, though the language in which it is done is not altogether explicit.

The United States Supreme Court has held that not only is the Federal act applicable to employees who at the precise time are engaged in interstate commerce, but also where the work which the employees are doing at the time is so closely related to interstate commerce that for all practicable purposes it may be declared to be a part of interstate commerce.

Perhaps the best illustration of that is the section laborer, the man who is out between the railroad yards, or out between stations, preparing the railroad right of way. Without exception it is held that these men are engaged in interstate commerce. The reason is that while perhaps there may not be a single train within the next hour over this line, he may be hurrying to make provision for the next train that comes; and while that train may be carrying nothing but intrastate commerce, yet, maintaining the roadbed does protect transportation in interstate commerce in general. Therefore, employees engaged in keeping up the roadbed, while not definitely engaged in interstate commerce at the time, are engaged in work so inseparable from it as to be for all practicable purposes part of it, and are determined to be within the provisions of the Federal act.

In the determination of a particular case, Mr. Justice McKenna, in commenting upon the desire of the public to have a definite rule laid down by the United States Supreme Court, said that it might be possible in some cases to do that, but in this field it was not possible to lay down any rule by which these questions could be determined. The court has steadfastly refused to pass upon any State effects except the one presented by the case in hand. It sticks to the text of the law and takes care of only those cases brought before it on the particular state of facts. The only way to get our bearings is

by the process of inclusion and exclusion and finally seeing what the understanding of the United States Supreme Court is likely to be.

For the remainder of this talk, I shall discuss some of the more typical cases that give us trouble. In those States which have written railway employees out of the law altogether, they are having no trouble, which is a gain from the standpoint of administrative obligation, but I question whether it is from the standpoint of the people of those States. It seems to me there should be an effort on the part of all the States to bring under coverage, as far as possible, those employees who do not have protection under the Federal employers' liability act. The Federal act not only took away from the States the right to take care of the man who can recover under the Federal employers' liability act, but also the right to provide any remedy for those employees who are injured in interstate commerce but, because of their own neglect, have no right of recovery under the Federal act.

A number of the States have undertaken to say that if the Federal employers' liability act does not provide benefits—if a man can not recover under the Federal act, though engaged in interstate commerce—he may not have the benefits of the compensation act or any other State statute. The Federal law, they contend, covers the entire field as to employees engaged at the time in interstate commerce, and if the man injured was at the time engaged in interstate commerce, and could not recover under the Federal law, nevertheless he could not recover under the State compensation law.

An effort was made in some of the States to provide remedies for the railroad employees under the compensation act where the injury was solely by their own neglect, but it failed in those States where it was undertaken.

I said a moment ago that maintenance-of-way employees, particularly those outside the railroad yards, are engaged in interstate commerce. There is another group of employees who are for the most part clearly within intrastate commerce, or no commerce at all, and for that reason are entitled to benefits under the State compensation laws if the State law is sufficient for the purpose. You can not, however, do as Minnesota has done, write them all out of the law and still give them benefits. It requires an amendment of the law to bring this group of employees under it if they are to be given protection though engaged in intrastate commerce at the time of the accident. Shop employees, those working in the terminal shops, are for the most part not engaged in commerce at all and may be brought within the provisions of the compensation act, as they are in most of the States. It makes no difference that the engine going into that shop just came off an interstate run; taking the engine out of service and putting it in the shop for overhauling and repairs takes it out of commerce altogether and leaves it subject to the laws of the State, if the State law is sufficient for the purpose.

Those two groups of employees form a large percentage of the railway employees, and in many of the States appreciable benefits are coming to these employees because of the compensation laws.

Train operators—firemen and engineers, brakemen, and conductors—are, in practice, nearly always engaged in interstate commerce.

That is because of the fact that it is hard not to find in that train some piece of merchandise, some passenger, or some bit of mail that is bound for a point without the State, or which came from a point without the State and is still being transported. If it is an entire intrastate train, moving from one point to another within the State and has nothing on board except a single passenger, or a single piece of freight of interstate character, the entire movement of that train is in interstate commerce.

Those are the things that give us trouble. If in the movement of trains, cars, or commerce of any sort, there is anything of an interstate character, that stamps the entire movement. Trains destined from a point within the State to a point without the State, or coming from without the State and traveling within the State, have an interstate character because of the terminals of the trip; therefore, anything done in facilitating the movement of that train is interstate in character, and that character will attach even though there may be a stop on the right of way to pick up an empty car that is only to be taken to the next station. Whether or not the car is empty or loaded with freight in intrastate commerce, the fact that the employee is injured while out on the sidetrack picking up this intrastate car, and putting it into an interstate train, the further movement of which is to be facilitated by getting that car into its line-up, stamps even that work as interstate commerce; and setting out a piece of freight, or a car, or whatever it may be, from an interstate train, is also work in interstate commerce.

So as to those trains which have their terminals or come from outside of a State, their entire movement is pretty well stamped as interstate commerce; on the other hand, if the terminals of the particular train under consideration are both within a State, and the train runs from a point within the State to another point therein without leaving the borders of that State, this general rule will not apply. Such a train has the stamp of intrastate character in the beginning and differs from the one destined to a point without a State, so that the question of whether a man is engaged in interstate commerce as this train moves is another thing.

As a train crew, we may have in our train a car loaded with interstate commerce destined to a point within the State. If we stop and set that car out at a junction point, so that it may be picked up by some other railway line or another division of the same railway and have no other interstate commerce on the train, then as we move along we are engaged in intrastate commerce; and so we are when passengers are taken from a point within the State to another point within the State. When, however, we pick up a man who has a ticket to a point without the State and he rides to a junction point and gets off, while he is on the train we are engaged in interstate commerce, but after he gets off the train at the next depot, we are engaged in intrastate commerce; and so it is with the cars we pick up, bring in, and set out, etc.

The train destined from a point within the State to another within the same State has the stamp of intrastate character, and it takes on an interstate character only when there is something on the train which itself is a bit of interstate commerce. It can readily be seen

what confusion this causes, and these are the cases which are difficult of administration.

The following applies more particularly to freight trains. It is the practice of railway companies to use the same engine and caboose, with the same train crew to take them out and stay right with them; that is, to run to a particular terminal within the State, or to one without the State, and to return therefrom. While that train crew, if it is destined to a point without the State, will be engaged in interstate commerce on the way to the point without the State in whatever work it does, when it reaches that point and while returning it is still engaged in interstate commerce. If the terminal is within the State, the crew will be engaged in interstate commerce if there is anything in the train that is of interstate character; but if, although they may have been engaged in interstate commerce on the outward trip, there is no interstate commerce in the make-up of the train on the return trip, the character will change and the crew is engaged in intrastate commerce. This is not so, however, when the engine crew is given the job of taking a car or a train—a car usually—and transporting it to a point beyond the boundary lines of the State and then running back empty, because the running back is still a part of the original trip in purpose and the interstate character clings to the crew until it has returned.

With you, I think, confusion has come, as it has with us, largely with the repair services—the people working on repairs, not within the shops, but out on the so-called repair tracks, on the car that is loaded with interstate freight. Where the repairs are light or of a temporary character the car may be repaired out on the track, and if the freight remains in the car, whatever work is done on the car at the time is work in interstate commerce, and the employee who is injured is injured while engaged in interstate commerce. Even though the repairs on the car are slight, if the materials in that car are unloaded and put into another car, it loses its interstate character and the work is of the same character as if it had been done in the shops. It is not interstate commerce at all and comes within the provisions of the compensation act, if the State law is sufficient for that purpose.

The question of repairs—work upon repair tracks—brings much confusion. If two or three things are being done at the same time—for instance, if the character of service of an employee has reference to repairs on two cars, one of which has been taken out of interstate commerce and the other of which is still loaded, or if a man has been sent to the stock warehouse to get repair materials and is using these materials in the repair of both of the cars, because one of the cars is still in interstate commerce, even though only one small piece of material is used in the repair of that car his whole service is in interstate commerce.

Then there are those cases of going to and from work. Ordinarily the man, while he is going to and from work, is out of commerce. Still, that is not always so. I read of a case recently where the engineer and fireman took their engine to the point where they were to leave it for the night. It was an engine which had just come in off an interstate run and which was to be used on an interstate run the following morning by the same fireman and engineer. The

engineer was injured as he was leaving the premises of the employer, and the court held that he was still engaged in interstate commerce although at the time he was not operating the engine, but was going off the premises.

The men who work on the repair tracks are not usually engaged in any kind of commerce. When they come back the next morning, if they are injured as they go to their work, they are not outside the benefits of the compensation acts unless some particular status of an interstate character can be attributed to them, because no one knows what particular piece of work they are going to do when they get there. They may work on an intrastate car or an interstate car, or they may not work in commerce at all. You just have to dig into the particular facts at the time in order to get any definite idea as to whether or not this is a case for compensation coverage.

The wise compensation act has a specific provision that no train operator, no engineer nor fireman (and that means no brakeman), etc., who is at the time engaged in the operation of a train shall be within the provisions of the act. I mention that because I want to mention another thing—the attitude of the railroad brotherhoods with regard to their whole field.

I have been hoping that in my own State we could have a survey of just what is going on, just what the benefits are that are coming to these railway trainmen under the Federal employers' liability act, because for the most part they are engaged in interstate commerce and fall within that act. I should like to know how the percentage of benefits they get compare with what they would get under the compensation law of your State and my State. In my judgment their attitude of mind is prompted largely by the attitude of those people who are handling their claims and who pretend to advise them but who are not giving the best kind of advice. The sooner the brotherhoods come to the notion that all their employees should be brought within the benefits of some suitable compensation act, the better it will be for all concerned; but I do not look for that day to come until your State or my State—some State in this Union—shall have demonstrated from its own figures that it is best to do that. Then the question will go back to these men, and they will come to see that they might get greater benefits under the compensation acts.

Mr. Stewart has labored with this question for years and years. At one time I had the pleasure of attending a conference in Washington where we met the railway brotherhoods and endeavored to have them see the need for suitable legislation in their field. You are right up against a stone wall and you get no farther, because they tell you that they are perfectly satisfied, and while they are not worrying we need not to do any worrying, and what is it to us whether or not they have benefits. It is something to you and me. I do not want to have any of these men come and ask me why their railway could not pay damages or compensation. That has been your experience and it has been mine, that the laymen can not understand how you can make interstate commerce out of 99 per cent of the things that they have to do. They do not understand

the theory that the courts have adopted, and that group of employees will never be satisfied until this whole situation has been cleared up.

DISCUSSION

Mr. DUXBURY (Minnesota). The speaker referred to the Minnesota law in the matter of the exclusion of employees of railways. Our law is not based upon the nature of the commerce. It applies simply to employees of steam railroads expressly, definitely excluding them from the benefits of the act.

Mr. WILCOX. That was what I said, wasn't it, Senator?

Mr. DUXBURY. You didn't express it just that way. There is a distinction there. People may be engaged in intrastate commerce by other means than as employees of steam railroads and, of course, they would be within the act. It is not on the same basis. Of course, a large part of commerce is carried on by steam railroads, but there are other means. We have electric lines, which have employees, and their employees are under the compensation act, and also bus service, unless it takes on the character of interstate commerce, when the employees might be excluded for the reasons the speaker stated.

Mr. WILCOX. May I say another word? Interstate commerce applies to a thousand things. The telephone companies are engaged in it. The bus lines, the express companies, the Pullman service, all of those are engaged in interstate commerce, but they are all within the provisions of the bulk of compensation laws, I guess.

Mr. DUXBURY. They would be in our law, too.

Mr. WILCOX. Yes, they are. The language used in some of the statutes would tell you there was good reason for saying that perhaps you were excluding everybody in interstate commerce whether or not by railway, but that has not been the determination of the courts. You must have had presented to you many times, as I have—I have had concerns in the trucking business say so—that the commission didn't have a thing to do with the case because the man was engaged in interstate commerce and it was none of its affair.

Chairman ARMSTRONG. We have enjoyed Mr. Wilcox's talk very much in regard to this very intricate matter of interstate and intrastate commerce. The next paper will be by Mr. Sam Laughlin, a member of the State Industrial Accident Commission of Oregon.

Border Line Between Maritime Law and Compensation Cases with Specific Instances and Cases

By SAM LAUGHLIN, *commissioner State Industrial Accident Commission of Oregon*

Admiralty jurisdiction covers so broad a field that it appears not to lend itself particularly well to exact definition, but in so far as it is applicable to injury or death arising out of maritime casualties it affects those in the service of a ship, commonly called "seamen," and harbor workers, such as stevedores, shipwrights, and all others whose labor is incidental to commerce and navigation. That the

injury shall occur on the navigable waters of the United States is the preponderating fact in establishing admiralty jurisdiction, but there must also be some sort of maritime relation to bring a case within the jurisdiction of a court of admiralty. Border-line cases are those in which exception to the rule is claimed on the ground that the cause is not a maritime affair. The number of cases that have been taken to the Supreme Court of the United States bears witness to the difficulties encountered in attempting to apply the workmen's compensation laws to industrial injuries having even limited maritime features. Local court decisions may be interesting as applied to individual cases, but the frequency with which the rulings of State courts have been reversed must bar them as being of ultimate and controlling authority on the subject. Therefore, whatever illumination the subject gets from specific instances and cases must come from examination of the United States Supreme Court decisions which relate to the application of workmen's compensation laws to cases of a maritime character.

As to seamen, by the merchant marine act of June 5, 1920, Congress extended to them the rights and remedies under all statutes of the United States which were applicable to railway employees in the case of personal injury or death, thus conferring upon them the rights enjoyed by railway employees under the Federal employers' liability act. In the more recent law, known as the longshoremen's and harbor workers' compensation act, of July 1, 1927, Congress recognized the advantages of the workmen's compensation principle by providing compensation for disability or death resulting from injury to employees in certain types of maritime employment upon the navigable waters of the United States where recovery through State laws might not validly be provided. This law has been in effect much too short a time to permit definite conclusions concerning any effect it may have, except as stated, on the general subject of jurisdiction in border line between maritime law and compensation. In *Nogueira v. New York, New Haven & Hartford Railroad Co.* (50 Sup. Ct. Rep. 303), Mr. Chief Justice Hughes construed the act with regard to its exclusive features and gave a brief outline of its history. It has for a background a long line of decisions representing repeated attempts to secure compensation benefits to employees in maritime employment.

The established rule of admiralty that prevented recovery for injury or death in line of duty was out of pace with current conditions, and repeated attempts were made by employees who were injured in maritime employment to recover damages pursuant to the workmen's compensation laws of the States. Awards were granted on the theory that workmen's compensation was a valid substitute for common law, and therefore maritime employees could elect to take compensation benefits instead of any remedy available to them in admiralty. The legal status of maritime employees under such laws was questioned and the matter was taken to the Supreme Court of the United States.

The first important case was that of *Southern Pacific v. Jensen* (244 U. S. 205), which involved the death of a longshoreman, killed while on board and unloading a vessel. The Supreme Court held that the remedy was unknown to the common law and incapable of

enforcement by the ordinary processes of any court, and therefore was not among the common-law remedies saved to suitors under section 256 of the Judicial Code, and hence the remedy was contrary to the Constitution and laws of the United States.

Thereupon Congress undertook, by the act of October 6, 1917, to correct the situation by extending to suitors in admiralty the "rights and remedies under the workmen's compensation law of any State." This act was in the form of an amendment to section 256 of the Judicial Code which, prior to the amendment, gave to Federal district courts exclusive jurisdiction over all admiralty and maritime causes "saving to suitors in all cases the rights of common-law remedy where the common law is competent to give it." Under title of *Knickerbocker Ice Co. v. Stewart* (253 U. S. 149), a case arising out of the drowning of a bargeman on the Hudson River, the amendment was declared unconstitutional. The Supreme Court said: "Having regard to all these things we conclude that Congress undertook to permit application of the workmen's compensation laws of the several States to injuries within the admiralty jurisdiction," and thus construed the act was unconstitutional as being a delegation of legislative power of Congress to the States and as a defeat of the purpose of the Constitution in preserving the harmony and uniformity of the maritime law.

Congress again attempted to restore compensation benefits to maritime employees by the act of June 20, 1922. This act was also in the form of an amendment to the Judicial Code. Seeking to avoid the objections pointed out in the foregoing decisions, Congress added to the saving clause the words "and to claimants for compensation for injuries to or death of persons other than the master and members of the crew of a vessel their rights and remedies under the workmen's compensation law of any State." Nor was this limitation sufficient to meet the test of constitutionality. In *Washington v. Dawson* (264 U. S. 219), the Supreme Court, reaffirming the doctrine enunciated in earlier decisions, said: "This cause presents a situation where there was no attempt to prescribe general maritime rules. The manifest purpose was to permit any State to alter the maritime law and thereby introduce conflicting requirements. * * * The confusion and difficulty, if vessels were compelled to comply with local statutes at every port, are not difficult to see. * * * The subject is national. Local interest must yield to the common welfare. The Constitution is supreme."

On the other hand, the Supreme Court held that the maritime law might be modified to some extent and that State statutes could be allowed to have effect in cases arising out of employment having limited maritime features, or to causes of merely local interest. Such a case was *Grant-Smith-Porter Ship Co. v. Rohde* (257 U. S. 469), where a carpenter was injured while working on an unfinished vessel moored in the navigable waters of the Willamette River. The Supreme Court held that: "The contract for constructing the *Ahala* was nonmaritime, and although the incompleting structure upon which the accident occurred was lying in navigable waters, neither Rohde's general employment nor his activities at the time had any direct relation to navigation and commerce," and that "Under such circumstances regulation of the rights, obligations, and consequent

liabilities of the parties, as between themselves, by a local rule would not necessarily work material prejudice to any characteristic feature of the general maritime law in its international or interstate relations."

Another leading case in which the workmen's compensation law was held applicable to injuries arising out of maritime employment was that of *State Industrial Commission of the State of New York v. Nordenholt Corp.* (259 U. S. 263), a case in which a longshoreman was injured while working on a dock. The decision reads: "Insana was injured upon the dock, an extension of the land, and certainly, prior to the workmen's compensation act, the employer's liability for damages would have depended upon the common law and the State statutes. Consequently when the compensation act superseded other State laws touching the liability in question, it did not come into conflict with any superior maritime law. And this is true whether awards under the act are made as upon implied agreements or otherwise. The stevedore's contract of employment did not contemplate any dominant Federal rule concerning the master's liability for personal injuries received on land."

In both of these cases the Supreme Court pointed out that the decisions were not inconsistent with the doctrine established in the *Jensen* case. In essence this doctrine is: That admiralty has exclusive jurisdiction if the contract of employment is maritime and the casualty is maritime, unless the matter is of mere local interest; that State compensation may validly provide relief if the contract is non-maritime and the injury maritime, if the contract contemplates an exclusive remedy by compensation; and that State statutes alone are applicable to cases in which the injury is nonmaritime, notwithstanding that the contract may be distinctly maritime. What rules have been formulated will be found in later decisions of the Supreme Court where the doctrine is applied by those who fixed its limits.

Most of the cases here considered arose before the effective date of the longshoremen's act but that is not particularly important. The act does not modify nor change any characteristic feature of the general maritime law. Congress merely dealt with the rights and remedies of longshoremen whose injuries arose out of maritime employment. (See *Nogueira v. New York, New Haven & Hartford R. Co.*, 50 Sup. Ct. Rep. 303.) The exceptions are master and members of a crew of any vessel, or any person engaged by the master to load, or unload or repair any small vessel under 18 tons net. But no question arising out of these exceptions need be propounded here. The Supreme Court has said in precise language that no State legislation is valid if it contravenes the essential purpose expressed by an act of Congress, and by the two previously mentioned acts Congress definitely assumed control. Even in those cases where the Supreme Court recognized exceptions to the nonapplication of State statutes to admiralty jurisdiction, concurrent remedy has been at common law and the saving clause of section 256 of the Judicial Code is not extended to include an award under a State workmen's compensation act. (See *Brook's Case*, 1929, *American Marine Cases* 495.)

It has been so uniformly held that one engaged as a stevedore in loading or unloading a vessel is engaged in maritime employment that no point is made in reviewing cases pertaining to the question,

except as the doctrine has been applied to cases in which the employee was expected to work both on land and on water and the contract of employment did not contemplate the maritime features of the work. In *Northern Coal & Dock Co. v. Strand* (278 U. S. 142) a stevedore who worked regularly on the dock as well as on ships was killed while working on a ship. The ruling of the court was that "The unloading of a ship is not a matter of purely local concern. It has direct relation to navigation and commerce, and uniform rules in respect thereto are essential. The fact that Strand worked for the major portion of the time upon land is unimportant. He was upon the water in pursuit of his maritime duties when the accident occurred." Nor was this rule relaxed in *Employers' Liability Assurance Corporation v. Cook* (50 Sup. Ct. Rep. 308), where a workman was injured while unloading his employer's boat. Exception to the rule was claimed on the ground that it was of mere local concern, since Cook was required to work on a boat at such infrequent intervals as to make it merely incidental to his regular employment, and that since the matter was of mere local concern the elective features of the compensation law of the State prescribed the remedy, thereby abrogating any right to resort to an admiralty court. The decision of the Supreme Court reads: "Whether Cook's employment contemplated that he should work regularly in unloading vessels or only when specially directed to do so is not important. The unloading of a ship is not matter of purely local concern, as we have often pointed out. Under the circumstances disclosed the State lacks power to prescribe the rights and liabilities of the parties growing out of the accident. The fact that the compensation law was elective in form does not aid the respondents. The employer did not surrender rights guaranteed to him by the Federal law merely by electing one of two kinds of liability in respect of matters within the State's control, either of which she has power to impose upon him."

It has been likewise definitely settled by the decisions of the Supreme Court that repair men and mechanics working on a completed vessel in navigable waters are engaged in employment directly affecting commerce and navigation, and that in case of personal injury arising out of such employment both injury and employment are maritime and within the exclusive jurisdiction of admiralty. This opinion has been so uniformly held that nothing is gained by detailed examination of each case. (See *John Baizly Iron Works v. Span* (50 Sup. Ct. Rep. 306), a workman painting an engine room; *Great Lakes Dredge & Dock Co. v. Kierejewski* (261 U. S. 479), a boilermaker making repairs on a scow; *Gonsalves v. Morse Dry Dock & Repair Co.* (266 U. S. 171), a workman repairing plates on a steamer in dry dock; *Robins Dry Dock & Repair Co. v. Dahl* (266 U. S. 449), a workman falling from a scaffold into the hold; and *Messel v. Foundation Co.* (274 U. S. 427), a boilermaker working on a smokestack.) In each of the foregoing instances it will be noted that because of the relation of the work to navigation and commerce the circumstances of the locality prescribed the remedy. They are, strictly speaking, not border line at all.

No rule can be formulated from exceptions. What is of mere local concern must be determined from the circumstances of each case as it arises. The most that can be said is that it follows logically that

to come within the purview of a State compensation act a maritime casualty must have no direct relation to navigation or commerce. Returning to the *Rohde* case, the building of ships is not maritime subject matter in this country. The vessel on which he was working, while substantially completed, was not ready for delivery—not yet an “instrumentality of commerce.” The Supreme Court held that the contract of employment was nonmaritime, and although the accident occurred upon the water the exclusive features of the compensation law prescribed the remedy, since he and the employer had consciously contracted in contemplation of the State statute.

In *Sultan Railway & Timber Co. v. Department of Labor* (277 U. S. 135), it was held that workmen engaged in assembling and taking apart rafts of saw logs were not in maritime employment. The work was done prior to and after actual transportation. The work was on the water but so remotely related to navigation that it might be regulated by the local rule.

Another exception is *Alaska Packers' Association v. Industrial Accident Commission* (276 U. S. 467). Peterson resided in California. Within that State he entered into a contract with the employer to go to Alaska as a seaman on one of their boats, and after arriving at Alaska he was to go ashore and work according to directions given there. Among other things he made nets, looked after small boats, took them out, and served as a fisherman in one of them. When he was injured he was standing on the shore pushing a stranded boat into the water and the ruling of the Supreme Court was: “Whether in any possible view the circumstances disclose a cause within the admiralty jurisdiction, we need not stop to determine. Even if an affirmative answer be assumed the petitioner must fail. Peterson was not employed merely to work on the bark or the fishing boats. He undertook to perform services as directed on land in connection with the canning operations. When injured certainly he was not engaged in any work so directly connected with navigation and commerce that to permit the rights of parties to be controlled by the local law would interfere with the essential uniformity of the general maritime law. The work was really local in character.”

In *Miller's Underwriters v. Braud* (270 U. S. 59), a workman, employed as a diver by the National Shipbuilding Co. submerged himself from a floating barge anchored in a navigable river for the purpose of sawing off the timbers of an abandoned set of ways once used for launching ships that had become an obstruction to navigation. He died from suffocation and the Supreme Court said: “In the cause now under consideration the record discloses facts sufficient to show a maritime tort to which the general admiralty jurisdiction would extend save for the provision of the State compensation act; but the matter is of mere local concern and its regulation by the State will work no material prejudice to any characteristic feature of the general maritime law. The act prescribes the only remedy; its exclusive features abrogate the right to resort to the admiralty courts which otherwise would exist.

“As the matter stands to-day there is the same overlapping jurisdiction between State and Federal Governments that is familiar to interstate commerce, that gives different rights to different employees—or for that matter to the same employee—according to the

undertaking. For example, if an employee such as a longshoreman engaged in maritime employment is injured on the land or on the dock, which is an extension of the land, he is subject to the provisions of the local workmen's compensation act; if, while engaged in the same sort of labor, he is injured on board a completed vessel afloat in navigable water, his rights are prescribed by the longshoremen's act; if, however, his contract of employment gives him the classification of seaman, his remedy is still at common law or in a court of admiralty. And the question is, To what cases does each law apply according to its terms."

DISCUSSION

Chairman ARMSTRONG. We have just listened to the paper read by Mr. Laughlin, from Oregon, on the subject of border line in maritime law, and the discussion was to be opened by Mr. Jerome G. Locke (U. S. deputy commissioner administering the longshoremen's and harbor workers' compensation act, New York), who I understand has not yet arrived.

[Secretary Stewart requested permission to include Mr. Locke's discussion in the record.]

Mr. LOCKE (New York). Some weeks ago my good friend, Commissioner Stewart, advised me by letter that I would be permitted to contribute something in the way of discussion on the "Border line between maritime law and compensation cases." I replied that in three years' experience under the longshoremen's and harbor workers' compensation act I had found no border-line cases and suggested another subject which I thought would merit discussion by this body. A week or two ago I received a copy of the program and noted that Commissioner Sam Laughlin had drawn the heavy task, which seems to be so near and dear to Commissioner Stewart's heart, and that I had an assignment to respond to his paper. I had escaped one side of the question only to be trapped on the other.

I assume that it is now my mission to prove that my good friend Sam Laughlin is wrong. This will be no small task. Sam Laughlin hails from the State where compensation commissioners have grown gray wrestling with problems that arose in the "border line between maritime law and compensation" in the days gone by. I come from an interior State where most of the rivers stand on end, and where the lakes are used almost exclusively for trout fishing and to furnish pictures for calendars. It was not until some time after I arrived on the Atlantic seaboard, about three years ago, that I knew there was a "border-line between maritime law and compensation cases." I can now appreciate that for many years there was such a twilight zone, very broad and indefinite. I believe that it has been largely removed by the passage of the longshoremen's and harbor workers' compensation act. At any rate, since the passage of that act something more than three years ago, we have had absolutely no trouble with the question in the port of New York. Perhaps, this is in some measure due to the fact that the State commissions up in my locality are easy to get along with. We just do not have any quarrels or even differences of opinion over jurisdiction.

If a man is injured or killed on a boat on navigable water or in a dry dock, his case is assumed by everybody to come under the longshoremen's act. If he is killed or injured on a pier or any other extension of land, his case is assumed to come under the jurisdiction of the State. If a case is reported to the wrong jurisdiction, the file is merely transferred to the proper office with notification to the parties in interest and the matter proceeds to a conclusion in an ordinary way.

As I have already stated, there was, prior to the enactment of the longshoremen's and harbor workers' compensation act, a very broad and indefinite border line, perhaps band would be a better word, between admiralty law and compensation acts. This arose out of the anxiety of the coastal States to provide some method of compensating men who were injured on the water adjacent to the boundaries of such States. The courts, equally anxious to bring such cases under compensation, where there would be a cheaper and more speedy remedy to the injured workmen, went to considerable lengths to stretch old principles and rules of law to sustain awards. The Supreme Court of the United States approved such awards under the doctrines of "local concern" and "injuries on appurtenances to the land" as coming under State acts.

I believe, however, that the enactment of the longshoremen's act has largely removed the broad band of haze and uncertainty between admiralty law and the compensation acts. If the expression be permitted, it has absorbed that twilight band. This new Federal act provides for the compensation of all persons injured on navigable water while engaged in maritime employment except (1) masters and members of a crew; (2) any person engaged by the master to load, unload, or repair any small vessel under 18 tons net; (3) any public officer or employee; and (4) any person to whom compensation may be validly provided by State law.

It is only this last exception—namely, the exception of persons to whom compensation may be validly provided by State law—that threatens to give any trouble. I doubt whether it will be particularly bothersome in the future. In the case of *Nogueira v. New York, New Haven & Hartford Railroad Co.*, cited by Commissioner Laughlin, as well as the cases of *Employers' Liability Assurance Corporation v. Cook*, and *John Baizley Iron Works et al. v. Span*, decided by the Supreme Court on the same day (April 14, 1930), there is a very definite indication that the court is minded to exclude from State jurisdiction almost any type of a case where the injury occurs on navigable water and where there is an apparent remedy under the longshoremen's act. Of course, I am not sanguine enough to think that we will escape all trouble due to this question in the future. The Supreme Court has already laid down the doctrine on "local concern" and "injury on an appurtenance to the land," and these rules may offer some stumblingblocks in future cases.

Chairman ARMSTRONG. I will now call on Mr. Donald D. Garcelon, chairman of the Industrial Accident Commission of Maine.

Mr. GARCELON (Maine). We are all very much indebted to Mr. Laughlin for his illuminating paper on the legal boundary line set by the United States Supreme Court between injuries on navigable

waters in employments governed by the general maritime law, and those in employments which, being of local concern only, are properly covered by State compensation acts. Injuries on the land, he points out—or on the dock which is an extension of the land—are, of course, subject to the provisions of such acts. But it may not be entirely clear in all cases whether or not certain injuries would be deemed to be injuries on the land. What law will apply when the circumstances surrounding injuries to maritime workers are partly on land and partly on a vessel or in navigable water itself?

In *Smith & Sons v. Taylor* (276 U. S. 179) a longshoreman working on a wharf was struck by a sling and knocked into the water, where later he was found dead. Although it was contended that admiralty had jurisdiction on the ground that the cause of action was solely for death that occurred in the water, the court was of the opinion that the case was clearly compensable under the local compensation act since, as it says, "The blow by the sling was what gave rise to the cause of action. It was given and took effect while deceased was upon the land. It was the sole, immediate, and proximate cause of his death. The substance and consummation of the occurrence which gave rise to the cause of action took place on land."

I may add by way of parenthesis that in any event the longshoremen's act would not apply to a situation such as this, since it covers only those who at the time are employed on navigable waters. It, of course, follows from the *Taylor* decision that if, on the contrary, he had been swept from the vessel to the wharf, maritime law would have prevailed.

Suppose, however, that a stevedore or ship repairman is injured on a ladder or gangplank extending between the vessel and the dock. The respective jurisdictions in such cases are concretely distinguished in *The Atna* (297 Fed. 673), where it is stated, upon the principle that jurisdiction is not lost until the established relation or status is clearly lost or changed, that if the injury occurs while passing from the vessel to the shore, before he is entirely free from the ship and has safely reached the shore, admiralty has jurisdiction; but if the injury occurs while passing from the shore to the ship, admiralty does not have jurisdiction until he reaches the ship and is entirely separated from the shore. In other words, the ladder or gangplank is deemed an extension either of the ship or of the dock according as the employee is using it as a necessary exit from what at the time is his locus of employment.

The two cases just cited indicate the solution of a third class of cases which is a combination of them both. In *The Strabo* (98 Fed. 998) a workman on a vessel lying at the dock fell from a ladder while passing from ship to shore, landed on the dock and was injured there. Does that make it a shore injury and therefore compensable? The court said:

The injury commenced when, by the slipping of the ladder, the libellant was thrown into the air. Whether or not this was *damnum absque injuria* can not be told, but it is true, as the district judge said, "that the whole wrongful agency was put in motion and took effect on the ship, and thereby the libellant was hurled from his position on the ship, and before he reached the dock was subjected to conditions inevitably resulting in physical injury wherever he finally struck." The cause of action originated and the injury had commenced

on the ship, the consummation somewhere being inevitable. It is not of vital consequence to the admiralty jurisdiction whether the injury culminated on the string piece of the wharf or in the water.

A clear, consistent distinction is thus made in these cases between the final, physical, disabling injury and the legal, responsible injury which sets the train of consequences in motion. In injuries in employments that are of local concern only, the question of the locality of the injury does not of course arise. But in injuries to maritime workers it is the place of the accident itself that determines the proper jurisdiction rather than the place of the resulting physical injury.

Perhaps it was not necessary to add this supplementary note to Mr. Laughlin's able presentation of the subject. I do know, however, that in years past, at least, some States—including my own—had considered the rule to be otherwise; and in view of the United States Supreme Court's recent authoritative ruling on the subject, in accord with the other Federal cases just cited, it seemed not amiss to call attention to it in order to avoid any possible misunderstanding in the future.

Chairman ARMSTRONG. We have enjoyed Mr. Garcelon's talk very much. If there is any further discussion in regard to this or the paper read before, we will call for it before we take up the next point.

Mr. HUBER (Oklahoma). May I ask a question? Senator Duxbury and the other men were talking about interstate commerce on top of the ground. The Oklahoma commission is afraid that there might be a test through our interstate commerce underground. I do not know whether Mr. Baker has had that kind of thing in Kansas, but the question is this: We start gas from Amarillo, Tex., and run through Oklahoma, through Kansas, through Iowa, through Illinois, and into Chicago; and then there is the transfer of oil from Kansas to the Gulf, this oil passing under the ground. Is that interstate commerce?

The Oklahoma commission is afraid that it might come to a test any day, so it uses the soft pedal when it has questions concerning gas and oil that is under the ground. We have border-line cases. What is the Middle West going to do with its oil and gas passing under the ground? Is it interstate commerce? Will these men come under the interstate commerce law? That is the question.

Mr. WILCOX. I happen to have the quotation from the Oklahoma act. The law, so far as it makes any mention of interstate commerce, reads like this: "Compensation provided for in this act shall be payable for injuries sustained by employees engaged in street and interurban railways, not engaged in interstate commerce, and railroads not engaged in interstate commerce."

There are other provisions there, but it was evidently intended to exclude from coverage any street and interurban railways that were engaged in interstate commerce, and likewise any steam railway.

Mr. Huber, the transportation of oil from a point in your State to a point in another State is interstate commerce, just as in the case of the trucker who takes a load of freight or moves your household goods from a point in your State into another State. The Oklahoma commission need have no worry about its right to cover in-

juries incurred in the transportation of oils from a point in your State to a point without the State or from a point without the State into Oklahoma, so long as Congress has not undertaken to act in that field; and the only reason why States may still regulate that commerce is the fact that Congress has not undertaken to do it.

Congress has the authority, but the Supreme Court of the United States has held, and in many cases the lower Federal courts have held likewise, that until such time as Congress does take possession of this field the States have the inherent right to do it, and so Oklahoma may go ahead and regulate the transportation of her oils without any fear, unless Congress takes over the subject matter, which it is not likely to do.

Mr. McSHANE (Utah). Do you or Mr. Huber recall whether the Oklahoma act has extraterritorial effect? There are employees, as I recall, in about five States walking that pipe line.

Mr. HUBER. Seventeen States.

Mr. McSHANE. Certainly there is no question but that those who are in Oklahoma will be entitled to the benefits of the Oklahoma act; but if the Oklahoma act does not have extraterritoriality, an employee in Kansas walking the pipe lines if injured must apply to the Kansas commission.

Mr. WILCOX. Oklahoma has no provision with regard to its extraterritorial types of injuries; and I do not know what the courts have held in regard to it. That is a question which will be determined by the act.

The thing I understand Mr. Huber was worrying about was whether the State came in conflict with the United States Government by doing that, and I was answering that particular question and not undertaking to discuss the question of the extraterritorial application of its law.

Mr. BAKER (Kansas). We have had it come up in Kansas in this rather peculiar way. We find that the State of Minnesota particularly has several firms of attorneys who specialize in interstate cases and endeavor to get hold of cases in Kansas and circumvent the jurisdiction of the commission. Our theory of the laws is that inasmuch as the courts have held that in the contractual relation either party should have authority to invoke the contract, either party may file a claim.

A case was started by attorneys of Minnesota in the Federal courts, alleging it was an interstate case. The lawyer came and consulted me with reference to their right to file a claim—an application—before our commission. I informed him he had a right to do it. The application was filed and set for a hearing, and an application was made in the district court to restrain us from hearing this case. The court there held we could not be restrained, and that it was within our province to go ahead and take jurisdiction and determine as to whether it came within interstate or intrastate laws. It was appealed to the Supreme Court, but in the meantime there was a settlement.

I feel that fundamentally the compensation law gives to the employer the right not to be sued at common law where the compensation law exists, and therefore he should in turn be afforded the protection of the jurisdiction of the commission in those cases.

We had this come up in a second case, but it was likewise settled. That is our difficulty in interstate commerce administration.

[Chairman Armstrong read a telegram received from Will J. French, director of the California Department of Industrial Relations, who expressed regret at his inability to attend the convention.]

Chairman ARMSTRONG. The next paper this morning is by Maj. Matt H. Allen, chairman of the Industrial Commission of North Carolina, *What Power Should Commissions and Boards Have to Compel Testimony?*

What Power Should Commissions and Boards Have to Compel Testimony?

By MATT H. ALLEN, *chairman Industrial Commission of North Carolina*

It is universally recognized that our workmen's compensation laws have been designed to provide a forum before which compensation claims may be quickly and summarily heard and determined and relief immediately granted without expense to the contesting parties.

I assume that with only a few exceptions the several industrial commissions and accident boards of this country are charged with the duty of administering the compensation laws without restriction to the performance of mere administrative acts.

It is my understanding that the great majority of industrial commissions and accident boards are required in all contested cases to find the facts and apply the law, and where such responsibility is placed upon a commission or board, it must necessarily exercise judicial power, in addition to its administrative functions. When the legislature vests in a commission or board judicial power it becomes a court, regardless of the failure of the statute so to declare.

The North Carolina Industrial Commission, which I have the honor to represent, in addition to the performance of administrative duties, such as the approval of agreements, the assembling of data and compiling of statistics, is authorized and required to conduct hearings in all contested cases, the hearings to be had in the county where the accident occurred, and stenographically reported; and the award, together with a statement of the findings of fact and rulings of law, shall be filed with the record of the proceedings. The commission has the power, by the terms of the act, to subpoena witnesses, to administer oaths, and to examine or cause to be examined books and records of the parties to a proceeding if they relate to questions in dispute.

The industrial commission is not referred to in the act as a court, and before the act went into effect we called upon the attorney general for a ruling so that we might know whether or not the individual commissioner had the power to compel testimony. The attorney general ruled that the industrial commission was a court and therefore had the power to compel testimony. Under the act the commission is required to get the findings of fact, and the act requires that the court shall be bound by findings of fact. Our

supreme court said in one case that it would not examine the record to see whether there was any evidence to support the findings, but would be bound by the findings of fact.

Only a court can compel testimony and unless a commission or accident board is recognized as a court, I can not see how it can be expected rightfully and respectfully to function. One case, which I heard, so forcefully convinced me of the necessity of having the assurance of power to compel a witness to testify that I shall use it as an illustrative case.

The plaintiff in the case was an employee of a building contractor. On the 19th of October, 1929, while admittedly in the performance of his duties, he was seriously injured by a blow which rendered him unconscious, fractured his jaw, and caused a contused laceration of the cheek. He made an apparently good recovery and the attending physician terminated disability on the 4th day of November. For this temporary disability compensation was paid pursuant to a perfunctory award approving the agreement which had been entered into. Subsequently, the plaintiff suffered a change in condition, characterized by a feeling of numbness, difficulty in articulation, followed by paralysis affecting the left arm and leg. The insurance carrier would not voluntarily accept liability for the recurrence of disability and the possible permanent injury. Upon the petition of the plaintiff I conducted a hearing. The hearing was adjourned from the courthouse to the bedside of the injured man, who was not in a condition to be moved. Incidentally, the adjournment required that the attorneys, witnesses, court reporter, and commissioner travel several miles to another town. I thought that the plaintiff's physical and financial condition required immediately such alleviation as it might be in my power to afford. At the hearing it developed that the only issue involved was purely a medical question. One physician, who did not examine the broken jaw, and who did not see the plaintiff until several days after the accident occurred, would not venture an opinion as to whether the paralysis was or was not a result of the injury of October 19. The attending physician was then called upon to testify and answered all questions directed to him until requested by the court to express his opinion as to whether or not the blow received by the plaintiff would likely have produced the paralysis. He replied that he had an opinion but would not testify unless he was assured of an expert witness's fee. The questions asked this witness by the court and his answers were as follows (I quote from the record) :

Q. Have you an opinion satisfactory to yourself, from your treatment of the plaintiff and knowledge of his condition at the time and subsequent to the accident, as to whether or not the blow received on October 19th could or would have likely produced the paralytic stroke on January 12th?

A. I have an opinion, but I will not testify unless I am first assured of an expert medical fee.

Q. What is this opinion?

A. Do you qualify me as an expert?

Q. No, sir; it is not my province to qualify you. I can only pass upon your qualifications when I know them. I only know that you are a practicing physician up to this time. You may give me a statement as to your education, training, and experience, and I may or may not find you to be an expert.

A. Then I decline to express an opinion.

Q. Doctor, I again ask you to answer the question and give me your opinion as to whether or not this claimant's present condition is the result of the accident and injury of October 19th?

A. I decline to answer the question.

Q. Doctor Hayes, I direct you again to answer the question, giving your opinion as a practicing physician as to whether or not this man's condition is the result of the injury on October 19th?

A. I decline to answer the question.

Q. Doctor Hayes, I have no desire to do anything that would hurt or injure you in any way, and I hesitate to enter judgment that will embarrass you, but I must insist that you render the proper respect to me as a court and answer the question propounded. The question which has been asked you is the only question to be determined by the industrial commission at this hearing, and upon it depends whether or not this claimant will be awarded or denied compensation. I want to be entirely respectful and courteous to you, and I hope that you will not let anything personal influence you in your decision to answer this question.

A. I still decline to answer the question.

Q. Now, Doctor Hayes, I want to say to you that if there is anything personal which has entered into your refusal to answer this question, I hope you will put aside any personal feeling and consider me for the time being as a court, and entitled to the respect due to a court, and I direct you again to answer the question propounded by the court. In this connection I want to say to you that this hearing was had in the bedroom, at the bedside of the claimant, who was your patient, because he was unable to attend court, and because he is in such condition that his family greatly needs any compensation that may be due him, and that the question of compensation can not be decided until the question which has been propounded to you is answered and passed upon by the commission.

A. It is my understanding that a medical man's opinion is his personal property and is to be paid for at his price. An expert must be paid expert fees. That is my understanding. You have the right to order me to examine the man and ask my opinion as an expert.

Q. Doctor, before entering any judgment I want to say to you that if you have any doubts about your rights and desire to advise with counsel, there are two good lawyers present, one representing the plaintiff and the other the defendants, who will tell you what you should do under the circumstances. The court refuses to trade with you, and I shall not argue this question further.

A. When I seek expert advice I expect to pay for it, and I prefer to consult my own lawyer.

Thereupon, in open court, I found the following facts and sentenced the witness to 10 days' imprisonment:

1. That Dr. R. B. Hayes was the physician who attended the claimant after his injury and continued to treat him as his physician until he returned to work nine days thereafter,

2. That Dr. R. B. Hayes was duly and regularly subpoenaed as a witness to attend the hearing at the residence of the claimant, J. O. Thompson, on Monday, March 3d, at 3 p. m.; that in response to said subpoena Doctor Hayes did appear in person and was duly sworn as a witness on behalf of the plaintiff,

3. That Dr. R. B. Hayes deliberately and definitely refused to answer the question propounded by the commissioner as to whether or not the present condition of the claimant is the result of the accident and injury for which the said Doctor Hayes treated the claimant.

4. That the said Dr. R. B. Hayes, by his refusal to answer the question propounded by the commissioner, meant and intended to show his contempt for the court.

It is therefore ordered and adjudged by the commissioner that Dr. R. B. Hayes be confined in the common jail of Orange County, N. C., for a period of 10 days, or until such time as he shall decide to answer the questions propounded by the court, execution to issue on the 5th day of March, 1930.

Thereupon, this hearing is continued until the commission may have competent physicians visit the claimant and make an examination, after which an award will issue.

In this connection I want to say that under the laws of North Carolina in many cases of contempt a man may purge himself. While I thought this man's conduct was contemptuous, I made the execution to issue on the following day in order that he might purge himself before the execution was issued if he so desired, but he elected not to do so.

I then directed to the sheriff or keeper of the common jail of Orange County a commitment ordering the arrest of Doctor Hayes and that he be committed to jail to serve the sentence as pronounced.

Doctor Hayes immediately instituted a habeas corpus proceeding before the judge of the superior court to stay execution against the person and to have the issues determined. The issues raised were: (1) Is the North Carolina Industrial Commission a court? (2) Has the industrial commission the power to attach for direct contempt? and (3) Did the refusal of the witness to testify constitute contempt?

The judge held that the commission is a court, dismissed the habeas corpus proceeding, and remanded the respondent into custody. From this judgment Doctor Hayes took exception and appealed to the supreme court, applying for a writ of certiorari. The writ was granted. There the matter rests. The supreme court will hear cases on appeal from the doctor's district some time this fall, when it is expected finally to dispose of this contempt proceeding.¹

While the doctor was litigating his rights in the superior court I appointed two disinterested experts to visit and examine the claimant, with the result that compensation was awarded.

This one experience has provoked more than a little consideration of the necessity to compel testimony. Here is a commission, required to find the facts in contested cases, many of which were formerly tried before a court and a jury. The commission's "findings of fact" are conclusive and binding upon the superior and supreme courts. Judgments based upon those findings are presumed to determine the rights and duties of the interested parties.

Would it not give rise to a serious indictment against our American ideals of democracy to require any commission or board to find the facts in a case, with no right of appeal, and vest in it no power to compel testimony relative to the main issue, particularly when the witness admits he is in a position to testify?

If the supreme court holds that the industrial commission is a court, it follows that it had the power to compel testimony; and the great weight of authority is to the effect that the refusal of a witness to testify so directly obstructs the court in the performance of its duty as to justify punishment for contempt.

One other question raised in this contempt proceeding may be of interest to all present, to wit:

Is the professional opinion of a doctor or other expert private property for which he or she has the right to make any charge that he or she sees fit?

¹The supreme court affirmed the judgment of the superior court, holding that a hearing before the industrial commissioner is a judicial proceeding, and he has power to punish for contempt a duly sworn witness who refuses to testify in proceedings before him. (In re Hayes, 200 N. C. 133, 156 S. E. 791.)

The only case that I have found dealing directly with this question arose in the State of Illinois in the case of *Dixon v. People* (63 Ill. App. 585).

In that case the appellant knew nothing of the facts of the case, but he declined to answer a hypothetical question propounded except upon the payment of a fee of \$10. The court ruled he was in contempt, and found that the fee was reasonable, thus presenting the one question as to whether or not the appellant could lawfully decline to give his professional opinion without reasonable compensation.

The court said among other things:

The statute has fixed the compensation to be paid all witnesses, and the law requires every person, without regard to his calling or engagements, to appear as a witness when duly subpoenaed and to accept as full compensation the statutory allowance, however inadequate it may be.

The administration of justice in the adjustment of the contentions growing out of the business affairs or concerning mere private, personal, or property rights of the citizens, is one of the most important sovereign duties devolving upon the State. Upon the performance thereof depends the public peace and tranquillity, and the safety and security of the property, reputation, person, and family, of every private citizen. Every citizen is therefore deeply interested in the proper discharge of that duty. It can only be discharged through the medium of judicial tribunals. Without the power to compel witnesses to attend and disclose facts in their knowledge pertinent to these contentions, these tribunals are powerless and can not perform their functions. No distinction can, we think, be drawn between different kinds of knowledge, nor can a witness decline to make known facts which have come to his knowledge, either by observation or study and experience, upon the ground he can use such facts or knowledge for his pecuniary benefit in the business affairs of life, when the disclosure thereof is important to the attainment of justice in the courts.

No reason is perceived why compensation beyond that fixed by the general laws of this State should be allowed to this class, or to any one class of experts, unless it is allowed to every other class, of which there are many. Some works on expert testimony enumerate as many as 70 classes of expert witnesses.

To hold that each member of these different classes of witnesses may lawfully demand that litigants shall arrange for the payment of reasonable compensation before he can be compelled to disclose in open court facts in his knowledge relating to the right and justice of causes there pending for determination would be impracticable, and would often operate to subject a litigant to financial burdens so great as to practically deny him a hearing in the courts; would tend to make the administration of the law depend upon the financial ability of the suitors to compensate witnesses in order to have the benefits of facts in their knowledge, and to bring such testimony into discredit as having been purchased, and to attach scandals and grave suspicions to expert witnesses and expert testimony.

Nor does the rule requiring experts to testify for legal fees deprive the witness of his property for public use.

Knowledge gained by study, observation, and experience is not property within the meaning of the word as used in section 13, article 2, of the Constitution, wherein it is provided that private property shall not be taken or damaged for public use without just compensation.

It was contended by the doctor that his professional opinion was his private property, for which he had the right to make any charge that he saw fit, and that the courts had no jurisdiction over it.

While this may be true, in dealing privately with individuals, no such rights can be recognized when he is called into court to aid in the administration of public justice. It must be apparent that if the industrial commission, or any other court, were required to trade with doctors and other persons who claim to be experts in their

particular line as to the price to be paid for their expert opinions, the administration of justice would be hampered and outlawed, and degenerated to a money consideration. Under such conditions what would happen to the claimant who was without funds and unable to pay the doctor's price in a contest with a corporation or insurance carrier who had unlimited funds?

I believe that such a position can not be defended, and we do not feel that the great and honorable medical profession of this State and country will give its approval to any such uncharitable and revolutionary position.

In conclusion, I would recommend that a commission or board which would compel testimony should first learn where it stands in the realm of jurisprudence, and if its standing as a court is questionable, it should have its laws so amended as to remove all doubt.

These cases will not often arise, and if you have the right to compel testimony it is not likely that your power will be challenged.

DISCUSSION

Chairman ARMSTRONG. We have listened to the very interesting paper of Major Allen, and the discussion will be led now by Mr. McShane, of the Industrial Commission of Utah.

Mr. McSHANE. I have been very much interested in the paper that has just been read. It certainly raises in my mind a very serious question regarding compensation administration, one that I did not expect to arise.

When I was requested to lead this discussion, I made some examination of the respective statutes of the various jurisdictions dealing with this subject.

A review of the statutory provisions of a large number of States respecting the attendance of witnesses and their testimony in proceedings before the various commissions reveals a monotonous similarity. Of 38 statutes examined, 30 definitely place the power of compelling the attendance and testimony of witnesses in the hands of the courts. This includes North Carolina. I have a memorandum of the respective provisions. This is section 54 of the North Carolina statute:

(a) The commission may make rules, not inconsistent with this act, for carrying out the provisions of this act. Processes and procedure under this act shall be as summary and simple as reasonably may be. The commission or any member thereof, or any person deputized by it, shall have the power, for the purposes of this act, to subpoena witnesses, administer or cause to have administered oaths, and to examine or cause to be examined such parts of the books and records of the parties to a proceeding as relate to questions in dispute. Any party to a proceeding under this act may, upon application to the commission, which application shall set forth the materiality of the evidence to be given, cause the depositions of witnesses residing within or without the State to be taken, the costs to be taxed as other costs by commission. Such depositions shall be taken after giving the notice and in the manner prescribed by law for depositions in actions at law, except that they shall be directed to the commission, the commissioner, or the deputy commissioner before whom the proceedings may be pending.

(b) The county sheriffs and their respective deputies shall serve all subpoenas of the commission or its deputies, and shall receive the same fees as are now provided by law for like services; each witness who appears in obedience

to such subpoena of the commission shall receive for attendance the fees and mileage for witnesses in civil cases in courts of the county where the hearing is held.

That is about the gist of 30 acts, but I want to read further :

(c) The superior court shall, on application of the commission or any member or deputy thereof, enforce by proper proceedings the attendance and testimony of witnesses and the production and examination of books, papers, and records.

As I said, there is a monotonous similarity of these statutory provisions in 30 States, and North Carolina is in that group of 30. The States are: Arizona, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Jersey, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and New York.

Five States (Kansas, Maine, North Dakota, Rhode Island, and Texas) are given power to subpoena witnesses and compel their attendance without that last provision telling where the power lies to enforce the powers of the commission. No provision was found providing specifically the machinery by which such powers would be enforced in these States.

I have not yet seen or read a decision or had called to my attention a decision by any court in any jurisdiction which held a commission to be a court of law. In view of the fact that commissions have only quasi-judicial power, that they can only exercise administrative and ministerial duties, that their jurisdiction is special and limited, it is inconceivable to me that the power to punish by attachment proceedings as for contempt and to commit the offender to jail, or to impose a fine, or both, is implied or conferred by implication. I hope that Major Allen is right and that he will be sustained.

It would therefore seem that these five States must also, as a last resort, appeal to the courts to enforce the attendance and testimony of witnesses; but three States—California, Montana, and Virginia—have directly conferred upon their respective commissions ample power regarding this matter. In these States the commissions are given the same powers as are given the courts respecting the enforcing of attendance of witnesses and the compelling of said witnesses to testify after making appearance.

With the present status of compensation law there is some question in my mind as to the wisdom of clothing the commission with the powers of a court in this respect. All administrators of compensation law realize that we have an unusually large number of points of irritation; in other words, I believe that an industrial commission has greater opportunity to make more people angry in a short space of time than any other organization I know of, and the conferring of court powers upon the various commissions regarding attendance and testimony of witnesses would only aggravate this condition with no certainty of improving administrative efficiency.

I have written to the three States named that have the unquestioned power to punish by attachment proceedings as for contempt, as to whether they have ever experienced any difficulty. I had replies from two. They have had no trouble. One did not answer.

I have also made other inquiries and have found no State that is experiencing any difficulty in regard to the attendance and testimony of witnesses. There may be some of which I have not been advised, and certainly Major Allen has had enough for all of us.

In so far as our own experience goes and in so far as the experience of other jurisdictions is concerned, there appears little or no need for the added power. It is true that in States of the far West, which are sparsely settled and where it would be necessary sometimes to travel 250 miles before a court could be reached, to petition that court for an order requiring a witness to come in and to respect our subpoena to appear and to be sworn, and, after being sworn, to testify, might take a week, and if such a situation arose, it would certainly be a very serious handicap. We also, as in North Carolina, conduct all our hearings in the immediate vicinity of the place where the applicant resides, and in such remote sections as I have mentioned, for instance to go from San Juan County to Boxelder County it would be necessary to travel 250 miles of none too good roads, and then the court—that is, the judge—might not be there.

However, as the greater number of courts are in almost constant session and in densely populated portions of the United States where most of the business is done, in my opinion, very little necessity exists for granting to the commission the power of a court to punish for contempt.

I do not think it would do any harm, and I think that perhaps it might have some salutary effect if the question did arise; but if a man is contemptuous and is going to be in contempt, he usually doesn't care much more for a judge than for a commissioner in the absence of a judge. He will be careful in the immediate presence of the judge; however, when he knows we have to travel 200 or 300 miles to find a judge and get an order, he is likely to stand out, but to have a change of heart in the last analysis.

Chairman ARMSTRONG. Discussion will be continued by G. Clay Baker, chairman of the Commission of Labor and Industry of Kansas.

Major ALLEN. Before Mr. Baker speaks, may I be permitted to make one statement? I want to say with reference to the clause of our act as to the superior court, that that was construed by our attorney general's department as conferring upon the superior court concurrent jurisdiction with the industrial commission, and that without that subsection the superior court would have no jurisdiction whatsoever over the parties to a claim before the industrial commission, because the jurisdiction of the superior court in these matters was taken away from it and transferred to the industrial commission by section 11 of the act.

The first clause of that section of the law gives us power to subpoena witnesses and administer oaths.

Mr. McSHANE. I assumed your county court would sustain that.

Major ALLEN. I have been sustained by the superior court.

Mr. McSHANE. Then it is in the supreme court now?

Major ALLEN. And we will also be sustained there.

Mr. McSHANE. Well, I hope that you are.

Mr. STUTSMAN (North Dakota). I just want to say in this connection that I come from one of the five States referred to by Mr. McShane, and we are no different there than the other 30 States he referred to. While there is no statutory reference to procedure, we all know what it is, and it is perhaps due somewhat to the fact that we have in North Dakota a distributing clause in our constitution. It is true that in my experience of 40 years' practice of law I have never seen an administrative body such as the workmen's compensation body or board of railroad commissioners (to which I belonged for 10 years) which was held to be a court. The powers of government are distributed among the legislative, judicial, and administrative departments in most of the States. The bureaus are part of the executive department of government and have a quasi-judicial function, but have no rights as a court; so in North Dakota we realize that all of our boards have quasi-judicial powers but always have to resort to the courts for enforcement thereof.

Chairman ARMSTRONG. Mr. Baker will continue the discussion.

Mr. BAKER. This subject has been very thoroughly and comprehensively covered by the Major and Mr. McShane.

The Major predicts the decision of the supreme court of his State with reference to this question. I only wish that we could so confidently predict the decisions of our supreme court. Every time we guess them, we get fooled. I hope that will not be his experience in this case.

We are in the same category as most of the States mentioned by the previous speaker. In the very first case that came before our supreme court, I believe, that body placed about the same branding iron upon us as has been placed upon most of the commissions. That was in words to this effect: "The functions of the commission to which is committed the carrying of the provisions of the act into effect are those of an administrative body, vested, it is true, with some powers that are quasi judicial." While our statute specifically states that we may compel the attendance of witnesses and production of documents, etc., yet we do not think we have the power. I think it is unquestioned that we could not try a person for contempt, because we are not a court.

The Major in his paper speaks from experience. If I were to speak from our own experience in Kansas, I would say that we would be unwarranted in asking that our body be placed on a plane with the court in order to compel the attendance of witnesses. We have never had any difficulty in compelling the attendance of witnesses or the production of records, with the exception of one instance in which the doctor did not care to come and testify. We talked to him on the telephone and explained that we would make application to the district court for an order, and we didn't have to wait over 30 minutes for his appearance. So, speaking from the standpoint of experience, and I believe from what seems to be the experience of most States here, we are not warranted in taking the serious step, for the mere purpose of the production of testimony, of making a move toward placing commissions on the same plane as courts. I think this is a very serious matter, and it should not be undertaken until there is some cloak of qualification placed around the appointment of members of commissions with reference to politics.

I feel that in several States there is probably too much politics mixed in with the administration of commissions to warrant their being placed on a par with courts at this time. The court, I feel, is more or less a check upon the commissions, and it seems to me that until there is a different attitude surrounding the commissions' administration, that check should be left there.

Major ALLEN. I want to say to the gentleman from North Dakota that I happen to be a member of a city planning board in Raleigh and the supreme court of our State has held that that was a court. That city planning board has great powers—too much power, I think. I do not see how an industrial commission or a compensation commission which can conduct hearings and has the power to subpoena witnesses can function if the commissioner has to run a hundred miles to get a judge to say that it is not legal for a witness to come in, brandish a law book, and refuse to testify.

North Carolina may be unlike other States, but we have in North Carolina what Blackstone called a lot of shyster lawyers, and some doctors, and if they didn't have the respect for us that they have to-day, we would have trouble every week in the year in North Carolina. These lawyers are organizing all over the State in an effort to fight this act. They are entitled to, but, since we dealt with Doctor Hayes, when they come into court we are respected, and I believe that the Industrial Commission of North Carolina is respected as much as the superior court judges are. We have not abused that power in any way, and any commissioner who would abuse it ought to be impeached and kicked out; but if we were to have to certify matters to the superior court, it would make it impossible for us to function in these hearings; we could not conduct them.

In the first eight months we conducted 876 hearings. Up to the present time, I think we have reached 1,000—that was the number the day I left Raleigh. We hear on these schedules 8 or 10 cases a day, and if we had to certify these matters to the superior court, I would not remain on the commission. I would resign if I had to conduct a hearing to say whether or not an injured man should have compensation and then have a witness walk in and say, "I will not testify; I have no respect for you." I would not be a member of such a commission and I know without having been told what our supreme court is going to do about it.

We have more jurisdiction than the superior or supreme court in North Carolina. The State and all political subdivisions are subject to this act, and this is the only tribunal through which the State can be sued. The jurisdiction was taken from the superior court and passed to us and we feel we are a court; if I didn't feel that way, I certainly would send the other commissioners out. I would not subject myself to the insults of shyster lawyers and shyster doctors.

Mr. HOAGE (Washington, D. C.). I understood you to say that as far as a question of facts is concerned the commission is the court of last tribunal.

Major ALLEN. Yes.

Mr. HOAGE. Isn't it possible that if compensation commissions should follow that recommendation every compensation law would be declared void on the ground of the right of appeal over the decision of the commissioner?

In Washington, D. C., we have not felt that we are a court. We have felt ours is an administrative function entirely. Two cases are going to the Supreme Court of the District of Columbia on the question as to whether the commission is an administrative body and the final decision rests in the supreme court. I feel that the constitutionality of the act is really protected by that.

Major ALLEN. I fail to see it that way.

Mr. HOAGE. You stated that your State has no right to appeal on a question of fact.

Major ALLEN. I understand the Supreme Court of the United States has passed on that. It is an elective act, and it is my understanding that the Supreme Court of the United States has stated that by his election the man has come under the provisions of the act.

Mr. HOAGE. I wanted to ask that question. Where it is a compulsory act I can not see that the right rests there, and the constitutional right is impaired if only one member is to pass on the case and there is no appeal.

Major ALLEN. It is elective, so we are affected by that question.

Mr. WILCOX. As to the question whether doctors and lawyers and others affront the members of the commission, I think there is a deeper reason as to why we should hope, although perhaps that is not a courteous thing to say, that Major Allen will not be so successful in the court of that State. For my part I hope he may be told that, after all, his commission ought not to have this power of punishing for contempt, because there are other and better ways of doing the thing desired. The fact is, it ought always to be the desire of those who are administering compensation that finally there shall be brought together the administration of all of the labor laws of the State, with a centralized body administering all the labor laws of that State and having the power of making administrative orders. That, after all, is a more valuable function, a more beneficial function, to our States than just the matter of administering workmen's compensation.

In Wisconsin we have the power of issuing subpoenas and compelling the attendance of witnesses, but we have never thought of such a thing as punishing for contempt. It has always been urged in our State, not only since the passage of the act but prior thereto and as an incident thereof, that this body is an administrative body to determine facts and that is the end of its power. We are still leaving with the courts the right to determine the correct and legal construction of the laws if incidentally we do have to construe laws.

We have written into the law this further provision that any person who refuses to obey the subpoena may be punished for a misdemeanor and each day he refuses will add to the offense. It is a cumulative affair. I have never had—and I have had some years of experience—but one person tell me he would not testify before me. A doctor did ask me the question at random one time as to whether he would be accorded expert witness fees (as it was put to Major Allen) and I said, "I don't know whether you are going to get them. You attended the case?"

"Yes."

“And you are here and we want to know the facts. We are not asking you to testify expertly except as you acquired certain knowledge in order to treat the man, and all we want to know is what you did as a doctor in the case and what your conclusion is from your treatment of the case.”

He waived the objection and testified, and that is the last murmur we have had in that field. I do not think North Carolina needs to worry about everybody's rising in rebellion against the administration of the law. After all, the gentlemen from Washington (D. C.) and North Dakota, and Mr. McShane and Mr. Baker have sounded the proper warning; that is, to maintain our status, pure and simple, and clear to everyone, that we are an administrative body and that that is all of our function and we are not holding ourselves up as courts.

MR. HALFORD (Ontario). I was very much impressed with the paper that the major read. I think perhaps it is one of the bright lights of this convention, and I think it has caused quite an intense feeling. This question about the doctor interests us all very much. Most of us understand the doctors very well, and those of us who have had some years of experience in dealing with them can appreciate the situation.

I was very much surprised, however, when the major said he was going to fine the doctor and put him in jail. Some of the doctors perhaps may deserve it. We have had several cases where we had to subpoena the doctors. Some of them will come, but leave their books at home. We tell them they had better go back and get the books, because if they do not it might not be well for them. They are stubborn sometimes, as the major says, but eventually they bring their books. I will cite one case in which a man was injured but which was not supposed, in the beginning, to be a compensation case. This man went to the doctor, who insisted that he be paid a fee of \$20 before he would treat the man. The patient paid him the fee; in fact, he paid him for the whole course of treatment received. The case turned out to be a compensation case, and when the doctor learned this he put in a bill to the board for twice the amount he had received from the patient. We looked into the matter and asked the claimant to give us an account of all he had paid. The claimant had the receipts, which he brought to us; then we subpoenaed the doctor, who claimed that he had gone to the claimant's house some 8 or 10 miles out of the city and was entitled to the fee he had put in. We finally took the evidence of both of them, and the fact turned out to be that the doctor had never gone outside of his office to treat the claimant, the claimant having gone to the doctor's office, where he received all the treatment that he needed and had paid the bill himself. As a result, that doctor does no more work for the board. When doctors do not comply with the rules and regulations as regards making reports and do not give us the information we desire to enable us to adjudicate the different claims, we cut them off, as they are no use to us.

If we had the same case to deal with that Major Allen had, we would expect the doctor to make a full report as to the condition of the claimant and to give us his opinion. If he would not do that, we would refer the case to a specialist for an opinion, after which we

would deal with the doctor who refused to report in accordance with the merits of the case. We are not restricted in any way, and it would depend a great deal upon the attitude of the doctor as to whether he would do any more work for the board. We are in a little different position than your boards are, because we pay the doctors and in that way have jurisdiction over them. Of course, we do not employ them. The claimant and employer usually agree upon the doctor, who makes a report, but we have the say whether or not that report shall be received by us. We have full jurisdiction over these matters, and if the physician does not act in accordance with the board's policy, he does no more work for the board until he is ready to meet our views. Fortunately, the great majority of doctors are conscientious and desire to assist the board in every way they can, but the few who are bad—oh, well, I guess they think the compensation board was made for the doctors instead of the workmen.

Mr. McSHANE. Mr. Martinez, of Porto Rico, has requested that I call attention to a peculiar section of the Porto Rico act. It does not refer to the contempt matters regarding testimony of witnesses, but it is a condition that is peculiar to Porto Rico alone. Regarding reports of the employer, in most of the States a fine is provided for failure to make the reports, but of course, that fine has to be assessed against the employer in a civil action brought in the courts for that purpose.

I read from section 22 of the Porto Rican act just a little excerpt: "Employers refusing or neglecting to make the report required by this section shall be punished by the industrial commission by a fine not to exceed \$500." That has a tooth in it.

Secretary STEWART. So far as the history of this association is concerned, I think this is the first time this question has ever been sprung.

It seems to me that if these commissions have the power to subpoena a witness and their power ends there, it is very much like the old gag:

"Mother may I go out to swim?"

"Oh, yes, my darling daughter,

"Hang your clothes on a hickory limb,

"But don't go near the water."

It seems to me that any intimation that we have the power to subpoena witnesses and no power to compel them to testify is a farce. I hope that Major Allen is going to win and win hard.

Chairman ARMSTRONG. Is there further discussion?

Mr. WILCOX. I should like to ask Mr. Stewart if he thinks that in a compulsory compensation State the establishment of an industrial commission or compensation department with court powers, with judicial powers, is ever going to stand up. The tendency in this country should be toward compulsory acts. We ought to get away from the elective clause by which Major Allen justifies his position. The only thing we have to sacrifice in order to obtain compulsory compensation acts in this country is the question of whether or not you can punish a man for contempt. It is a small thing and it is proved by the experience of every single compensation commission in this country. North Carolina's is the baby act. It is

the latest act to have been passed, and they had that one case and the rest of us have gone for years with none of that trouble. Why worry about a thing of that kind?

Mr. PARKS (Massachusetts). I think this is a very interesting subject. I listened with a great deal of attention to Major Allen.

I think there are two sides to this question. Our good friend, Ethelbert Stewart, has told us one, that we ought to have power. I have been helping to administer the compensation act for 18 years and only once, I think, in that entire time—and I have heard a good many thousand cases—have I felt that I should like to have had the power to send a man to jail in a contempt proceeding, but I think that probably I would have been sorry the next day if I had done it.

We are dealing particularly with compelling doctors to testify. Major Allen has told us about Doctor Hayes, who was not an expert, and it was not an expert question he was asked. That should be determined. Doctor Hayes was the attending physician and he was being asked only what he had found as the attending physician; therefore, he was not in the category of an expert witness. I should have ruled to that effect.

We have to go easy on these doctors. Almost the entire administration of the law depends upon the doctor. I told you yesterday how I felt about their learning something about industrial surgery and industrial medicine, but I have no feeling against the doctors. I have the greatest respect on earth for them—they do wonderful work. We have not a great deal of trouble with doctors testifying in Massachusetts. They give us much help. Perhaps one of them will be asked an expert question, a little out of the field of attention given, and he will say, "Am I obliged to answer that? That is an expert question. Am I obliged to answer that without an expert fee?"

I rule that that is an expert question and he is not compelled to answer it for the ordinary witness fee.

Why do I say that? I will give you an illustration. In our State we have a system where the insurance carrier is obliged to file all medical reports with our board for our file. A lawyer in a given case had recourse to the file and had picked out about six names of doctors, experts in their line, who had been consulted in a given case by the insurance company's head office or head physician in an endeavor to find out what really was the matter with the injured man. They had not treated him; they were really experts. This lawyer for the employee summoned them all before a single member. The fee is 50 cents for an ordinary witness, and he gave them the sum of 50 cents each. These men who stood high in their profession came in response to that summons. The case was not reached that day and they had to come again.

I thought that was an abuse of the summons, and I informed him that he could not do that before me; that we were going to get the attendance of doctors—busy men—and we should have some sort of cooperation with them. That is what we want to look out for, cooperation with these doctors who are treating these injured men and upon whom we depend to tell us whether the injured man is

able to work or what is the matter with him. If we do not do that, if we are going to stand over them and say, "Doctor, you come in here or I will send you to jail," it might not be good business. The doctor might come in and say, "All right, if I have to go to jail if I don't go in, I will go in, but I won't say a darned thing."

It might go hard for the employee and hurt his case. It is much better to have this spirit of cooperation and to have the doctors come in wholeheartedly, as they do in my State. We have an excellent feeling between the board and the doctors, who come in and help us out without our having to be harsh with them. I think that is the side that should be stressed.

The supreme court in Massachusetts is not like that in Major Allen's State. Our supreme court, I know, would rule that we do not have the power to send men to jail in contempt proceedings. That is a power, our court has often said, that is inherent in the courts alone.

Major ALLEN. After those proceedings the doctors passed new resolutions as to the powers in this proceeding. I have had hundreds of letters saying, "Since we have read the record, we feel that you were thoroughly justified," and many of them said, "You ought to have put him in for 30 days instead of 10."

Secretary STEWART. I want to put into the record that when we began the administration of workmen's compensation laws, the relation of doctors' bills to compensation, or to the amount that the injured workman actually got, was 5 per cent. To-day it is 35 per cent, and in temporary cases it ranges from 50 to 75 per cent of the amount that the injured man gets.

When this law was first passed in England, the workingmen of England simply raised the devil and said, "This isn't a workmen's compensation law, it is a doctor's compensation law," and the Government of England threatened to socialize the whole subject of medicine—put doctors on the Government pay roll at a salary. If that be treason, make the most of it.

[Meeting adjourned.]

TUESDAY, SEPTEMBER 23—AFTERNOON SESSION

Chairman, Wellington T. Leonard, of the Industrial Commission of Ohio

Chairman LEONARD. Our first paper is a very interesting one and one in which we are all concerned, *The Rights and Liabilities of the Employee and Employer, Respectively, in Third-Party Cases*, by Mr. Abel Klaw, counsel for E. I. du Pont de Nemours & Co. (Inc.), of Wilmington.

**Rights and Liabilities of the Employee and Employer,
Respectively, in Third-Party Cases**

By ABEL KLAU, of counsel E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Del.

The subject of this paper brings up for discussion one of the most perplexing problems associated with the administration of workmen's compensation laws. This is especially true in so far as the employee and employer are concerned.

Legislation affecting the subject has not been uniform, and the variances which exist in the provisions of the statutes of the several States are such that in some States the injured employee is afforded remedies which are closed to him in others.

In one State compensation is the exclusive remedy unless the employer has failed to secure compensation as required by law, while in another State the employee is left solely to his common-law remedy against the third party.

In three States there is no provision governing third-party cases.

Four of the States seem to give the employee the right to proceed both against the employer and the third party, with provision for reducing the amount of compensation by the sum recovered.

Three of the States provide different remedies where both the injured employee and the third party are under the act and where the injured employee is under the act but the third party is not.

The employer's right to subrogation is generally provided for and the amount of his liability is usually limited to any deficiency which might exist between the amount recovered by the employee against the third party and the amount of compensation which would have been payable. Where subrogation is provided for most of the statutes require the employer to pay to the employee any recovery in excess of compensation.

The employee must, with few exceptions, elect which remedy he expects to follow, and in some of the States such election is final and limits his right to pursue another remedy.

Thus it is apparent that there is a lack of uniformity, although a first reading of several of the statutes gives one the impression of a similarity of provision.

Let us now examine the laws of the several States and the decisions thereunder in an effort to appreciate more fully the variances which exist.

In Arizona, California, Colorado, Kansas, New York, Oklahoma, Oregon, Washington, and the District of Columbia, and under the United States longshoremen's and harbor workers' act, the workmen's compensation law provides in effect that where a right of action exists against a third party not in the same employ, the employee may elect to take compensation or to sue the third party for damages. The same rule holds with modifications in the States of Delaware, Idaho, Maine, Maryland, North Carolina, North Dakota, Pennsylvania, South Dakota, Tennessee, Texas, Vermont, Virginia, Kentucky, Michigan, New Mexico, Rhode Island, Wisconsin, and Massachusetts. Acceptance of compensation in about 10 States operates as an assignment to the employer of the employee's claim for damages. If the other alternative be elected, the employer need pay only the deficiency, if any, between the amount recovered and the total compensation. Any recovery by the employer against the third party in excess of compensation and expenses of suit must be paid to the employee. In practically every State, the law provides that the employee may not compromise the suit against the third party at less than the amount of compensation without the consent of the commission and/or the employer.

There are many important exceptions to the above general rules and the following cases illustrate some of the limitations which have been placed upon these general provisions by the courts.

In Colorado the election must be in writing. Under the Kansas law, the election must be made within 90 days, failure to elect being construed as acceptance of compensation. In a New York case (*O'Brien v. Lodi*, 157 N. E. 925) it was held that an employee who settles his claim for damages with the third party, without the approval of the insurer, loses his right to a deficiency payment. The New York courts have held also that when a claimant elects to sue a third party and later abandons the action, which results in depriving the insurance carrier of his right to subrogation because of the running of the statute of limitations, the claimant is estopped from claiming compensation. (*McKee v. White*, 218 N. Y. Supp. 215.) On the other hand, where an employee in New York does not recover as much in a common-law action against the third party as he would have received as compensation, it is not such an election as discharges the employer. (171 App. Div. 736.)

California has held that the insurance carrier and an employee may sue jointly the third party without a formal award of compensation. (186 Pac. 800.)

Kansas courts have held that the claimant may maintain a proceeding against the third party and also may file a claim for compensation but that he can recover against one only. (176 Pac. 143.) In the same case, the court held there is nothing in the Kansas statute which says or implies that the claimant need choose between the damages and the compensation until he knows definitely which is the more to his advantage. In this respect, the Kansas law differs from some other State laws. In the case of *Stamps v. Missouri-Pacific Railway Co.* (218 Pac. (Kansas) 1115) it was held that the acceptance

of compensation by an employee does not estop him from prosecuting an action against the third party.

Under the United States longshoremen's and harbor workers' compensation act it has been held that a stevedore who accepts compensation for injuries is not entitled to sue the third party for damages upon the employer's refusal to bring suit (*Hunt v. Bank Line*, 35 Fed. (2d) 136); and that where compensation and medical bills were paid by the insurer, the injured longshoreman had accepted compensation and thereby lost his right to sue the third party. (39 Fed. (2d) 210.)

In about a dozen States, if the employer pays compensation, he is subrogated to the employee's right against the third party to the extent of compensation paid or payable, but any excess recovery must be paid over to the employee. It has been held in Texas that an assignment of such portion of the right of action as will indemnify the employer, does not bar the right of action against the negligent third person (217 S. W. 765); that the insurance carrier has no right of subrogation against the third person (204 S. W. 1181); and that where the employee had recovered compensation the claim against the third person was barred by his election to accept compensation (196 S. W. 647). As originally adopted, the Texas law did not provide for subrogation but this feature was changed by amendment in 1917.

In the case of *Southern Railway Co. v. United States Casualty Co.* (118 S. R. 266) the Supreme Court of Appeals of Virginia held that upon the making of a lawful claim for compensation by the employee against his employer, the employer by operation of law becomes the assignee of any right to recover damages which the injured employee might have against the third party, and the employer may enforce this right in his own name or in the name of the employee.

The Supreme Court of Pennsylvania held in *Zimmer v. Casey* (146 Atl. 130) that the compensation act recognizes the right in the injured person of a common-law action against the third-party wrongdoer.

In a few States it is the law that the commencement of an action or adjustment of a claim by the employee against the third party operates as a waiver of any claim for compensation.

In Wisconsin, however, the law provides that if the action against the third party is dismissed without prejudice before trial the employee is not chargeable with having waived his claim for compensation, but if the employee elects to take compensation, the employer immediately becomes owner of the right of action against the third person and may enforce such right in his own name; and it is held that the employer may assign this right of action. (146 N. W. 895.)

Under the Kentucky act an employee may, after receiving compensation, join his employer in a suit to recover against the third party, in which case the employer receives the amount paid as compensation out of the recovery. (197 S. W. 449.)

The Michigan courts have held that an employee who instituted compensation proceedings against his employer could not, after an adverse decision therein, sue a third party for damages. (225 N. W. 607.)

In Massachusetts if the employer pays compensation he is subrogated to the right of the employee against the third party, but he must pay to the employee four-fifths of any excess recovered. The law here also provides that upon discontinuance, with notice to the employer, the right to compensation is restored. Likewise the Wisconsin law provides for payment to the employee of any amount recovered from the third party in excess of compensation paid or payable, and in any event not less than one-third of the amount recovered, with adjustment of cost of collection in each instance.

In a Massachusetts case it was held that where an employee accepts compensation, he is precluded from bringing an action against the third person, because the employer is subrogated to the right to proceed against such third person. (113 N. E. (Mass.) 644.) This rule has also been followed in New York and Texas. (182 N. Y. Supp. 620; 196 S. W. (Texas) 647.)

In the States of Alabama, Illinois, and Minnesota two separate provisions of the law are in effect, viz: (a) Where both parties are under the act the employee may proceed against either the employer or the third party with the employer subrogated to the right if compensation should be accepted. However, neither the employee nor the employer can recover from the third party more than the amount of compensation payable. (b) Where the third party is not under the act, the employee may proceed against the third party for damages and the employer for compensation, but, if compensation is claimed or accepted, the employer is subrogated to the employee's right of action against the third party; and if the employer or employee collects from the third party, credit for the amount of recovery, plus or minus the cost of collection, must be given against the amount of compensation paid or payable.

In Illinois and Minnesota when the third party is not under the act, the employee may prosecute a claim for compensation at the same time that he is suing the third party at common law. (118 N. E. (Ill.) 429; 203 N. W. (Minn.) 622.) Under the Minnesota decisions, where the third party is under the act but the injury did not arise in the course of employment, an action will lie and the amount of recovery is not limited to the compensation rate.

In a very recent case, decided on July 19, 1930, by the Appellate Court of the Second District of Illinois (*Cipperly v. Carmack*), wherein the plaintiff brought suit against the defendant to recover for injuries sustained in an automobile collision, the defendant pleaded that the plaintiff was in the employ of Tolmie Bros.; that the plaintiff was injured while engaged in the duties of his employment; that Tolmie Bros. had elected to be bound by the provisions of the workmen's compensation act, and that the plaintiff had received and accepted from his employer payment on account of compensation for such alleged injuries, and averred that the plaintiff had no right to bring this action, and that the right of action belonged to his employer at the time under the rules of subrogation. The court held that it did not understand the rule to be that an employer under such circumstances could escape liability for his personal negligent act, because the business which he was operating was such as would bring him and his employees under the compensation act. The court stated that the protection of the act is not available to a negligent third

party merely because he happens to be an employer of labor and because his employees are within the statute. The accident must arise "out of" and "in the course of" the employment.

In the States of Connecticut and Louisiana the employee may claim compensation without losing his right to sue the third party. The employer, however, has the right, where compensation is claimed, to sue the third party for the amount of compensation paid. But the balance of such recovery goes to the employee.

In the State of Louisiana it has been held that the right of action against the third person is assignable. (74 So. (La.) 559.) This rule seems to have been followed in other States under similar laws. (174 App. Div. (N. Y.) 825.) The Connecticut Board of Compensation Commissioners has held that where an employee executes a release to the third person for consideration he is barred from presenting a claim for compensation. (1 Conn. Compensation Decisions 277.)

In Georgia, Indiana, Iowa, and Nevada the employee may proceed against both the employer and the third party, but the amount of compensation due is reduced by the amount of recovery, and the employer is subrogated to the rights of the employee.

In Iowa it has been held that where an employee has first recovered from the third party and afterwards receives compensation from the employer, the employer has no right of action or subrogation against the third party. (174 N. W. 329.) However, it has been held in the State of Connecticut that the amount paid by the third party in release of the employee's claim should be applied to the obligation of the employer to pay compensation. (103 Atl. 120.) The California act vests the right of subrogation in the employer, and in *Papineau v. Industrial Accident Commission* (187 Pac. 108) the court held that the employer's right to subrogation and his interest in the cause of action against the third party could not be impaired or destroyed by any act of the injured employee in which the employer had not concurred. This holding in California is contrary to the Iowa case referred to above.

The Indiana courts have held that a judgment against the third party for death, not paid, did not bar the right to compensation from the deceased's employer. (157 N. E. 366.)

In Michigan, if a dependent accepts compensation from the employer, this does not relieve the negligent third person from legal responsibility to others who might be entitled to damages on account of the death of the employee. (168 N. W. 1019.)

It has been held in the State of Massachusetts that where the driver of a truck was injured by coming into collision with a street car and died several days later, but before his death made a settlement with and gave a release to the street-car company, this did not preclude the driver's widow from claiming compensation for his death from the employer, as the right of the dependents to compensation was independent of his rights to disability benefits before death. (104 N. E. 565.)

The Missouri law provides that where a third party is liable for the injury, the employer is subrogated to the rights of the employee against the third party, without limit as to amount, but any recovery in excess of compensation must be paid to the employee.

Under the Nebraska law the employer is subrogated to the rights of the employee against the third party, but any recovery in excess of compensation paid and expenses must be paid to the employee to be credited on the compensation payable. Special provision is made for making the employer a party to any action by the employee against the third party.

In Nebraska the fact that an employer was insured against loss for compensation does not bar the employer's right of subrogation (240 Fed. 376); and an employer might assign his right to the employee and enable the employee to sue the third party. (172 N. W. 53.)

In New Jersey the employee may proceed against both the employer and the third party, but the employer is given credit for the amount of compensation due. No provision is made in the law for subrogation.

It has been held under this law that the mere fact that a common-law liability exists does not deprive the employee of his right to compensation. (86 Atl. 458.) It has also been held in the State of New Jersey that the employer's foreman may be sued as a third party. (102 Atl. 657.)

In the State of Utah compensation is the exclusive remedy unless the employer has failed to secure compensation as required by law. It is also provided that before compensation is paid the cause of action against the third party must first be assigned to the employer.

The Wyoming workmen's compensation law provides that where a right of action exists against the third party and there is no legal liability on the part of the employer, the employee is left to his common-law remedy against the third party, and no compensation is payable.

In the States of New Hampshire, Ohio, and West Virginia there is no provision in the law covering third-party cases.

However, it has been held in the State of West Virginia that an employee who receives compensation for an injury is not thereby estopped to sue a third person, not his employer, whose negligence caused his injury. (92 S. E. 112.)

Likewise the Ohio courts have recognized the right of an employee to sue the third party, as is evidenced by the case of *McDowell v. Rocky* (167 N. E. 589), wherein the court held that an allowance of compensation can not be set off against a claim for damages in the employee's action against the third party causing the injury.

Similarly the New Hampshire Supreme Court in the case of *Holland v. Morley Button Co.* (145 Atl. 142) held that the right to compensation under the workmen's compensation act for death of an employee, and the persons and proportions in which they shall respectively share, are so different from the right to recover from the third party that payment in discharge of the liability on account of the wrongful death can not be treated as a discharge of any of the employer's liability to pay compensation.

What constitutes an election to take compensation is a question of fact. In a Michigan case (167 N. W. 1024) it was held that the widow who had accepted some compensation from her husband's employer, and who had not made a claim for compensation and who did not have an agreement approved by the board, had not made an election and that she could maintain an action against the third

party. Mere negotiations with a third party have been held not to constitute an election which would preclude the injured party from claiming compensation. (180 N. W. (Wis.) 842.)

The Supreme Court of Rhode Island has held that where the employer and employee made an agreement that the money paid as compensation should be returned in the event of a recovery against the third party, the action against the third party was not precluded by the receipt of compensation, since the employee was bound to return it in the event of a recovery and hence could only recover against one of the parties. (103 Atl. 965.)

In third-party cases it is quite frequently necessary to determine whether or not the person responsible for the injury is really a third party, such as was intended by the legislature in granting to the injured employee the right to bring a common-law action in third-party cases.

It has been held under the Minnesota law that a fireman injured by his chief could sue his chief at common law, inasmuch as the injured fireman's chief is regarded as a third party. (212 N. W. 461.)

Similarly the Supreme Court of Pennsylvania has held that an employee injured through the negligence of a coemployee was not precluded from bringing an action at common law against the coemployee merely because they had both received compensation. In the Wisconsin case of *Cermak v. Milwaukee Air Power Pump Co.* (211 N. W. 354), the plaintiff workman, an employee of X, a contractor who had undertaken to construct a building for the defendant, was injured by the negligence of one acting for the defendant. The plaintiff recovered compensation from his immediate employer X, who was thereby subrogated to whatever right of action the plaintiff had against a third party causing the injury. X reassigned this right of action to the plaintiff, who then brought this common-law action in tort for personal injuries against the defendant.

The Wisconsin act provides that an employer subject to the act shall be liable for compensation to an employee of a contractor or subcontractor under him, who has not complied with certain provisions requiring compensation insurance to be carried, where such employer would have been liable if the employee in question had been employed by him directly. In the principal case, if X had not complied with the provisions of the act, it seems clear that under this provision the defendant would have been liable for compensation and, as the remedy under the workmen's compensation act is exclusive, would not have been liable in this tort action for damages. The court held, with three judges dissenting, that as the defendant was not actually liable to pay compensation here, due to the fact that the contractor had complied with the act, he was a "third party" and not an employer within the meaning of the act and therefore was liable to pay damages to the plaintiff in this tort action.

In the Ohio case of *Trumbull Cliffs Furnace Co. v. Shachovsky* (146 N. E. 306), an independent contractor was performing work for a corporation upon the premises of the said corporation. Both the owner of the premises and the independent contractor had complied with the workmen's compensation act. An employee of the independent contractor, having been injured in the course of his employment by the alleged negligence of the owner of the premises, applied for

and accepted compensation under the workmen's compensation act and later brought a personal-injury action against the owner of the premises. The owner of the premises pleaded as a complete defense the compliance with the compensation act by itself and the independent contractor, and the acceptance of compensation by the employee. *Held*, that the owner of the premises is not the employer of the said employee.

In the case of *Artificial Ice & Cold Storage Co. v. Waltz* (146 N. E. 826) it was held by the Appellate Court of Indiana that where one contracts for performance of work by a contractor, he is, as to such contractor's employee, "some person other than employer" within the workmen's compensation act, which provides that where an injury is sustained under circumstances creating liability in some other person than the employer the injured employee may proceed at law against such other person.

From the foregoing it can readily be seen that great variances exist in the provisions of the workmen's compensation laws in the various States and that very little attempt has been made to standardize this particular section of the law which, in practically every State of the Union, has been continued in effect as originally enacted, although many amendments have been made to other sections. A uniform provision for this section of the law would be desirable. But the diversity in the statutes is evidence of the difficulties to be found in formulating a provision that fully serves the interests of one party without doing injustice to the other.

Before concluding, I would like to refer to a recent case decided by the Supreme Court of the United States, where it was held that under certain circumstances both the employee and the employer might have redress against the third-party wrongdoer. In the case of *Staten Island Rapid Transit Railway Co. v. Phoenix Indemnity Co.* (75 Law Ed. 348) a workman in the course of his employment had been killed by the negligence of a railway company, from which his widow recovered damages in excess of compensation and thereupon the employer's insurance carrier became liable to and paid to the State treasurer of New York \$1,000 for certain "special funds" under the provisions of the New York law requiring payment into "special funds" where no compensation is due the dependents of the deceased from the employer. The Supreme Court held constitutional the provision of the New York law allowing recovery of such payment from the third-party wrongdoer.

The Wisconsin law specifically provides for such recovery, and the foregoing decision is authority for the constitutionality of the Wisconsin law.

DISCUSSION

Mr. McSHANE (Utah). You quoted the Utah statute. That is what the Utah Legislature intended because I was on the committee at the time it was passed, but we have a little piece of court-made legislation which reads into that law now that compensation shall be the exclusive remedy in case of third-party injuries; it reads in that phrase, "as against his employer."

Chairman LEONARD. I am sure we are all very much interested in Mr. Klaw's excellent paper. It is true in my State that third-party suits are brought, but I venture to state that all commissioners here to-day have the same problem we have in Ohio, and that is getting the man who is hurt in a third-party accident back to work. We find that when a man is waiting for a suit to be decided, he is in pretty bad shape until it is adjudicated in court.

I should like to hear some discussion on this but our program is pretty long, so I think we had better go ahead.

The next paper will be by Mr. W. W. Warwick, chief counsel for the United States Employees' Compensation Commission, on Newer Problems of the United States Employees' Compensation Commission. He is from Ohio, also.

Newer Problems of the United States Employees' Compensation Commission

By WALTER W. WARWICK, *chief counsel of the United States Employees' Compensation Commission*

I am indebted to the program committee for the privilege of appearing at this convention to discuss, or rather to state and thus to present to you the opportunity to discuss, some of the newer problems of the United States Employees' Compensation Commission. It is doubtful if similar problems have arisen under State laws. I appreciate the opportunity to meet with officials from many States who devote their time to the important public service rendered in the successful administration of workmen's compensation laws.

The Government of the United States recognized more than 20 years ago its obligation to pay compensation to its injured employees. Its law of 1908, if now in effect, would not be called a compensation law, for its benefits consisted only of medical attention and full pay for not exceeding a year to a limited class of injured employees and one year's pay to beneficiaries in case of death. Dissatisfaction with this provision, and the progress made by the States in enacting more satisfactory compensation laws, brought about the Federal law of 1916. This includes all civil employees of the Government injured in the performance of duty and since 1924 specifically includes disease proximately caused by the employment. This Government relief is based upon loss of wage-earning capacity, without schedule awards, and with practically no commutation of future installments of compensation. While it might legally do so the Federal Government can not as a practical proposition terminate its liability to an injured employee, and therefore there is no limit to the amount of his compensation. A widow's allowance is for life unless she remarries. A limit of eight years is placed upon compensation to dependent parents. It may be fairly estimated that the law of 1916 eventually will present some cases of total disability, each one involving more than \$50,000 in compensation (at the maximum of \$1,400 a year) besides the cost of medical care.

After about 10 years' experience in the administration of this compensation law the commission created by it was confronted with the administration of the longshoremen's and harbor workers' com-

compensation act, effective July 1, 1927, and one year later with the administration of what is commonly known as the District of Columbia workmen's compensation act, relating to all employees in private employment at the seat of Government. The relief furnished to Government employees is on an entirely different basis than that of the two newer laws. The cost and benefits of the law of 1916 come solely from the Treasury of the United States. It is the provision made by the Government for its own employees and only the two parties are concerned. In handling a claim for injury to a Government employee the commission is required to make a finding of facts thereon and an award for or against the payment of compensation. In the absence of fraud or mistake in mathematical calculation the finding of facts in, and the decision of the commission upon the merits of, any claim if supported by competent evidence is not subject to review by any other administrative or accounting officer, employee, or agent of the United States. We thus have a compensation law in the nature of a welfare provision, with the action of the commission subject to review by itself at any time but not subject to review elsewhere. There is no right to sue the United States for a personal injury.

Upon taking up the administration of the longshoremen's act the commission was confronted with entirely different problems from those involved in the 1916 act. Through its deputy commissioners in 14 compensation districts, covering the United States and the Territories of Hawaii and Alaska, the commission is charged with the determination of the rights as between employers having employees in maritime employment upon the navigable waters and the injured employees of such employers. The benefits to be furnished by the employer, or insurance carrier, are limited to \$7,500 as compensation, with no limit on the medical expense. The commission faced, in 1927, a problem similar to that of a board or commission administering a State workmen's compensation law, except that the employees covered by the Federal law frequently are only a small percentage, sometimes less than 1 per cent, of the employees of an employer, his other employees being compensated, if at all, under State laws.

A problem new in compensation work was presented. The longshoremen's act provides for the issuance by deputy commissioners of compensation orders awarding compensation or rejecting claims, which orders, if not in accordance with law, may be reviewed in a United States district court on application within 30 days by a party in interest. There is no provision for a review by the commission sitting at the seat of Government. In view of the large territory covered by the longshoremen's act it may be assumed that such a review by the commission was omitted in order to expedite the settlement of cases, and possibly to avoid a review merely upon the record. This situation of one official being in effect the sole arbiter as to the facts of a case is not common to other compensation laws. This feature becomes more noticeable in practical operation when, in accordance with Federal precedents, the United States circuit courts of appeals have held that the finding of facts made by a deputy commissioner, if there was competent evidence before him, and in the absence of arbitrary or capricious action

on his part, will not be reviewed by the court but such finding will be conclusive.

The problem presented is that of uniform action in 14 compensation districts by deputy commissioners authorized to decide upon their own judgment solely, and without review. When a final decision is made on the facts it is not often that the law applicable thereto is questioned. How to obtain from a number of deputy commissioners the same measure of judgment as to what facts are established by the evidence, what percentage of loss of use an employee has suffered by an injury to a member of the body, and generally how to have men of similar minds and attitude toward important questions, are problems both new and difficult.

These new laws brought to the commission a problem new to it but to some extent familiar to those administering State compensation laws. The problem is that of participation in litigation in view of the questions involved under its statutory procedure in handling claims. When a party in interest seeks to have reviewed a compensation order issued by a deputy commissioner the latter (and not the commission) is the only necessary party defendant. Another party in interest—that is, the one wishing the order to stand—frequently intervenes and is made a defendant. While the longshoremen's act did not provide for any attorney or counsel, Congress by an amendment of May 4, 1928, made it the duty of United States attorneys in the several judicial districts to appear for the commission or deputy commissioner and to represent them in any court. These attorneys are under the general supervision of the Attorney General of the United States, and a policy has been adopted under which, when no constitutional question or important question of interpretation of the law is involved, the conduct of the litigation is left to the parties financially interested, the claimant and the carrier.

The law has not been in effect long enough to make available many precedents by court decision, nor is the procedure in handling such cases on behalf of the commission finally settled. While under State compensation laws the board or commission may be authorized actively to participate in all court cases with the purpose of defending its decision, the same procedure can not be applied in the case of the Federal commission because it does not make the decisions. The problem has been presented of the defense in different districts of compensation orders issued by deputy commissioners based upon different interpretations of the law, wherefore all of such orders can not be sustained. This problem is similar, in the difficulties encountered, to that of the best method of securing uniformity of interpretation and action in the first instance by deputy commissioners in the several compensation districts.

Many provisions of the longshoremen's act are identical with those of the New York workmen's compensation law. Where the wording is exactly the same there is presented the question in interpreting this Federal law as to the weight to be given to the decisions of the New York courts. One United States court has held that a provision in identical language must be construed as indicated by New York court decisions, and has stated the rule to be that Congress in inserting sections from the New York law accepted the existing court interpre-

tation and that the commission therefore was required to interpret and enforce the provision in the longshoremen's act in accordance therewith. Other United States courts, including a circuit court of appeals, have since held that the rule does not go beyond any other rule of interpretation and that the State decisions, while entitled to consideration, are in no sense conclusive in the interpretation of a Federal law. In applying the statute this latest view of the courts should be considered in connection with the fact that every year the Legislature of New York passes amendments to the law which are referred to by New York authorities as annulling certain court decisions.

Another problem the commission faced when the longshoremen's act took effect was its relation to the authorities administering workmen's compensation laws of the States. Due to the efforts of Congress, by its laws of 1917 and 1922, to confer jurisdiction upon the States to care for injuries to the classes of men known as longshoremen and harbor workers, and to the decisions for 10 years by the United States Supreme Court announcing its views of the exclusive jurisdiction of Congress in admiralty and maritime matters, and to the holdings by the court that the laws of 1917 and 1922 were unconstitutional, this commission could not but anticipate some difficulty in a conflict of jurisdiction in close cases between Federal and State authority. This difficulty did not materialize because of the spirit of cooperation shown by the State authorities and of their belief, which the United States Employees' Compensation Commission shared, that an injured employee ought to be compensated under either State or Federal law and a situation in which an injured workman would not receive the benefits of either law should be avoided. This was an example of an anticipated serious trouble that never happened.

The compensation law for longshoremen and harbor workers recognized by special and adequate provision the extent of the applicability of State workmen's compensation laws. That compensation under the Federal law should be payable only if the disability or death resulted from an injury occurring upon the navigable waters of the United States (including any dry dock), and if recovery through workmen's compensation proceedings "may not validly be provided" by State law, we believe meant that the longshoremen's act shall not be construed to infringe on the authority of the States. This purpose is accomplished by requiring that the longshoremen's act shall extend only to cases which, under past or future decisions of the United States Supreme Court, can not be validly, that is constitutionally, cared for by State laws. The words "may not validly be provided by State law" have the same application and hold the same meaning to a State having no compensation law as to one that has, so that in construing this clause it is unnecessary and inappropriate to examine the language of any State compensation law or the decisions rendered thereunder, but it is proper to consider only the constitutional dividing line between Federal and State authority as it is marked at any time by the highest court.

There have been less than 100 court opinions disposing of cases taken to United States district courts for review of compensation orders issued by deputy commissioners. Helpful opinions have been announced in the few appeals taken to the United States circuit

courts of appeals. The decisions on important points are that the finding of facts by a deputy commissioner, when there is competent evidence before him, will not be reviewed by the courts; that as the deputy commissioner sees and hears the witnesses, and examines the injury suffered, he is the one to decide the percentage of disability and he is not bound to follow the weight of medical opinion; that a compensation law at best can only approximate exact justice, and holding, in effect, that the award of the deputy commissioner is to be assumed to be the best that can be done, emphasizing the usual holding in compensation cases that the law is to be construed liberally in favor of the workman. The courts point out particularly the freedom of the deputy commissioner from common-law or statutory rules of evidence or technical or formal rules of procedure except those stated in this law, and his duty to make such investigation or inquiry or conduct such hearing in such manner as best to ascertain the rights of the parties.

There was doubt expressed by insurance companies and employers concerning the constitutionality of the longshoremen's act. This presented a new and apparently a serious problem, but the first employee who sued his employer was met with the defense that the employer had secured the payment of compensation by qualifying as a self-insurer under the longshoremen's act and that the remedy given the employee under that law was exclusive. This view was concurred in by the State court in New York City in which the action was brought and by the Court of Appeals of New York, without opinion in either court. An application for a writ of certiorari was denied by the United States Supreme Court. While such a denial is not an affirmance of the lower court, it satisfied most of the interested parties that the highest court saw nothing substantial in the arguments submitted to it regarding the unconstitutionality of the law. In an opinion of April 14, 1930, Mr. Chief Justice Hughes, when discussing the longshoremen's act, refers to its "clear and constitutional requirements." As the law was passed by Congress upon the suggestion of the Supreme Court that Congress could provide a compensation law for these maritime workers and as it is in many particulars similar to the New York workmen's compensation law which theretofore had been held constitutional, it may be assumed that the court did not wish again to discuss the principle underlying workmen's compensation laws and their avoidance of constitutional inhibitions.

Having stated some problems which appeared only to disappear quickly, it is proper to mention the fact that on the part of insurance companies, and self-insurers as well, there was little disposition to stand on technicalities, but on the contrary a willingness to accept the law as written and, after production and discussion of the evidence and the making of a finding of fact, to accept the award made without contest. Based upon my official experience in interpreting the language used in many Federal statutes, it is my judgment that this law, which I first saw after its enactment, is remarkable in the degree of success the draftsmen attained in avoiding doubtful and ambiguous language.

Probably there is no workmen's compensation law with a better record than that of the longshoremen's act for quick settlement of cases and prompt payment of compensation. It is estimated that in

more than 95 per cent of the cases of injury no claim is filed, but in accordance with the statute payments begin within the 14 days after the employer has knowledge of the injury and are made periodically and promptly without an award. Hearings are held upon the application of either party when a claim is filed, are stenographically reported, and the deputy commissioner required to issue a compensation order within 20 days after the hearing. Thus even in contested cases the compensation is not unduly delayed. It is believed that a hearing is held in not more than 1 per cent of the cases. Many of these hearings are in death cases where it is advisable thus to establish who are the beneficiaries, the dates of birth of minors, etc. General satisfaction has been expressed with the procedure established by regulations and with the general administration of the law under the direction of the commission.

There still remains the problem of carrying out the specific requirements of the law and thus ascertaining the extent to which good can be accomplished thereby. It may be in accordance with experience to question whether the prompt payment of compensation without an award, and the avoidance of troublesome or expensive procedure in adjusting the rights of an injured employee, is a feature of the administration of the longshoremen's act entirely free from future difficulty. Simplification when carried too far sometimes produces for the future problems not thought of when one is contemplating the exceptionally good results flowing from informality. The law prescribes a definite procedure when a claim for compensation is filed, and this procedure necessarily leads to the issuing of a compensation order rejecting the claim or awarding compensation. This order becomes final at the expiration of the thirtieth day after it is filed in the deputy commissioner's office unless theretofore a proceeding to review the order in court is started.

However, when compensation without an award is paid regularly for some time, say, one year, and then is discontinued on the ground that the disability has ended, the man's right to file a claim and have the benefit of the prescribed procedure is still unused and continues for a year after the last payment of compensation. Notwithstanding the payments that have been made, the filing of the claim puts in motion the prescribed procedure and for the first time the nature and extent of the disability are given consideration and decision and the proper order issued. This subject, like that of informal agreements not specifically authorized by law, raises the problem of the number of cases really unsettled so far as termination of rights is concerned. Many cases may come up that might have been more satisfactorily adjusted if more formal action had been taken at the beginning.

In this connection is also the problem involved in applying the principle of decisions rendered by the United States circuit courts of appeals when they announce a rule of interpretation more favorable to the workman—as, for instance, upon the method of calculating the average weekly wage—than was followed in the payment without award of compensation to a large number of injured employees when the cases of the latter are still open, not having been terminated by a compensation order. This problem as it raises its head may affect materially the idea that prompt and periodical pay-

ments without an award is a procedure without faults and an unmixed blessing.

In State compensation laws it is not unusual to authorize the settlement of a case by the parties with the approval of the State's board or commission. The language of our law in its prohibition of assignments, releases, or commutation of compensation or benefits, indicates a different purpose, especially in the absence of any provision authorizing settlements or compromises or providing for the approval thereof. The problem thus presented to the commission is one of some difficulty because it is recognized there are exceptional cases where opinions as to the nature and extent of disability are at variance or are uncertain. To what extent, if any, can the commission authorize the approval of any settlement in the nature of an adjustment of differences between the parties? Considering the terms of the law, what effect would such approval have upon the rights of the claimant to further compensation?

I have referred to the compensation law for the District of Columbia as one of the newer problems of the commission. After discussion before the committees in Congress extending over many years the question of a suitable compensation law for the District was settled by making applicable by reference the benefits and procedure of the longshoremen's act to private employment in the District of Columbia. The law applies to practically every employer (other than the Government) carrying on any employment in the District of Columbia and thus includes an employer with only one employee used in his business and even if this employee works only a few hours during the year. There is no reference to hazardous employment. No exemption is made of office work, so that a professional man with one clerk is an employer within the law. As an all-inclusive law I believe it has no competitor, and therein arose some problems. The benefits of the District's workmen's compensation law are larger than those of any State except one. There is no State fund in the District. Compensation must be secured by an insurance policy unless the employer can qualify as a self-insurer and wishes to do so.

Although I have not made an exhaustive investigation, it seems that the District of Columbia is the only place in the country where a workmen's compensation law operates without any form of official control of the rates charged by insurance companies. This presented a problem which up to the present time has not caused great difficulties, although it can not be said that the problem is solved. While many employers believe the situation in the District of Columbia requires special treatment as to premium rates, on the ground that conditions of private employment there differ from conditions in the States, there has been no effort to question, except as to the amount of minimum premium, the rates established by insurance companies. There is no evidence of a general demand at this time for the creation of a public authority to make or to control rates.

In a statement of the newer problems confronting the United States Employees' Compensation Commission it is necessary in some detail to refer to its definite duty and responsibility for administering these laws. In addition to specific authority granted in the longshore-

men's act for the commission to prescribe procedure and the forms to be used, there is the usual general authority to make all such rules and regulations as may be necessary in the administration of the law. The commission has sole control over the authorization of insurance companies to write insurance under the new laws and the sole authority to authorize employers to act as self-insurers. It also has full authority over the special fund for rehabilitation and the granting of the additional compensation necessary for maintenance of certain injured employees, and the furnishing of prosthetic appliances or other apparatus to disabled employees. The special fund is made up of sums of \$1,000 paid by a carrier in each death case, if it is determined that there is no person entitled to compensation.

One problem in connection with the authority to make rules and regulations relates to what extent, if at all, the commission is authorized or required to supervise and direct the actions of its deputy commissioners in individual cases. This problem appears because of certain statutory authority vested in deputy commissioners, without a review of a compensation order issued by such deputy being specifically authorized by the commission but only by the court. The law gives a deputy commissioner full power and authority to hear and determine all questions in respect of a claim, with definite provision for court review.

From the nature of the employment, and the appointment by the commission, it has been contended that a deputy commissioner is a deputy of the commission, acting for and in its name, and therefore the commission is responsible for his every action. Upon the general principle that responsibility presupposes authority, it may be that the commission is solely responsible if it permits a construction of the law, or a conclusion from the facts in any case, if the construction or conclusion in its opinion is not in accordance with law.

Under the usual Federal procedure the department or establishment, at the seat of Government, charged with the appointment and removal of deputies or other employees in the field is expected to secure uniformity of decision as well as of procedure by rules and regulations, and by instructions in specific matters. This accepted principle of administration is not so clearly applicable when a deputy commissioner, who, the courts hold, is essentially an administrative officer and in no sense a judicial one, is called upon at the moment of deciding a case, as is true of many executive officers, to exercise a quasi-judicial function after having seen and heard the witnesses, examined the injured man, and weighed the medical and other evidence.

It may be impossible in practice for a commission sitting at Washington properly to direct the decision in such matters and in such circumstances. If the problem, as I have heretofore stated it, is to be solved, can it be that the approximation to uniformity of decision by the many deputy commissioners will be found through a supplementing by regulations of the rather definite procedure prescribed in the law itself, and in the interpretation only by the commission in the first instance of doubtful provisions of the law with a change in the interpretation, when required, by final decision of the courts?

A problem met in administering any Federal regulatory law is that of the best method of securing uniformity throughout the

country without throwing upon the courts the burden of deciding questions that should be handled by administrative authority. It is also most desirable to avoid cases getting into the courts that ought not to be there. The advantage in the public interest of avoiding throwing upon the courts problems that are clearly those of administration, and thus leaving the courts free to assume only their own large responsibility for the final interpretation of the language used by Congress, is obvious.

Having stated some of the newer problems of the commission, and I can not take more of your time, I shall welcome in discussion now, or otherwise, your ideas concerning the solution of any of these problems. I have confidence that the experience of those at this convention will be a real help to our commission.

Chairman LEONARD. The State funds have problems. I see that you have them, too, Mr. Warwick, but you have more leverage than we have in the administration of your program.

The next paper is, *How Shall We Treat Willful Misconduct Cases and Where is the Border Line?* I understand Mrs. Roblin could not be here to-day, but her paper has been prepared.

[A motion was made, seconded, and carried to include Mrs. Roblin's paper in its proper place in the proceedings.]

How Shall We Treat Willful Misconduct, and Where is the Border Line?

By MRS. F. L. ROBLIN, *commissioner State Industrial Commission of Oklahoma*

[Submitted but not read]

It appears to be one of what I may term the cardinal provisions of most every compensation act that the willful infliction of injuries in the course of employment excludes the claimant from either all or partial benefits of compensation.

In discussing "How shall we treat willful misconduct cases, and where is the border line?" an understanding of the legal meaning of the term "willful misconduct" seems essential. What have the courts said on that subject? A few of the large volume of authorities on this given point will suffice. In my State of Oklahoma, in the case of *Wick v. Gunn* (169 Pac. 1087)—which has been quoted approvingly by other States—the supreme court said: "The mere intentional and voluntary failure on the part of a workman to use a proper safety appliance does not necessarily make the act willful as contemplated by the exception under consideration. The willfulness contemplated amounts to more than a mere act of the will and carries with it the idea of premeditation, obstinacy, and intentional wrongdoing." The facts in this case were that claimant had been working for this employer only a few days, and prior to his employment there he had been operating a machine without a safety guard. When he went to work, the safety guard, which was not automatic, was hanging below the machine and out of place. On the day claimant began work the respondent directed him to use the guard whenever possible and showed claimant how to adjust the guard in order to make it work more easily. At the time of the injury claimant was making a door out of flooring lumber and desired

to cut the tongue off of one piece of the flooring, and in order to save time for his employer and inconvenience to himself he ran this piece of lumber through the machine without attaching or using the guard. It did not appear that the claimant had any thought of violating the law or other wrongdoing but used the machine in the manner in which he had been accustomed at other places where he had worked, and in so acting he carelessly received the injury. But, as the court said, there was no idea on the part of the injured workman of premeditation, obstinacy, and intentional wrongdoing.

In the case of *Gigman v. Studebaker Corporation* (186 Mich. 574), where an employee undertook to cross in front of a standing train without looking to see whether it was about to start, the court said: "While it is quite clear that the claimant's injury was brought about by his own gross negligence, we are of the opinion that it can not be said as a matter of law that he was guilty of such intentional and willful misconduct as would defeat his recovery."

In another case where an employee was engaged to do whitewashing and was told not to work around machinery until the noon hour when it was stopped, but he started to work there just before it was stopped, and was injured, the court said: "His decision to do some whitewashing during this very interval seems more like a sudden thought than a willful act." The fact that the injury was occasioned by the employee's disobedience to an order is not decisive against him; to have the effect, the disobedience must have been willful, deliberate, not merely a thoughtless act on the spur of the moment."

Several of the States, California for one, provides that where injury is caused by willful misconduct of the injured employee the compensation recoverable shall be reduced one-half, with certain exceptions where the accident results in death or permanent total or permanent partial disability. Wisconsin has a provision for reduction of 15 per cent where willful misconduct is established. Some compensation acts also provide that where an employee is guilty of willful misconduct the compensation shall be decreased.

In attempting to fix the boundary line let us compare the rights of an employee at common law with his rights under the compensation act. In so doing it may be said that whereas the common law denied recovery where it appeared that the employee acted with a degree of knowledge of danger of injury, described as "negligence" or "assumption of risk," the compensation act proceeds upon the theory that where injuries resulted from conduct accompanied by such a degree of knowledge of danger or risks inherent in the employment, the consequent expense thereof should be borne by the industry. As said before, serious and willful misconduct certainly means something more than negligence. There must have been a premeditated design or intention on the part of the claimant to cause his injury. As has been amply said, there must be something more even than gross negligence. It involves conduct of a quasi-criminal nature. Under a number of compensation acts, including that of my own State of Oklahoma, willful misconduct of an injured employee bars recovery, and therefore the question whether or not the behavior of the employee at the time of his injury amounted to willful misconduct within the meaning of the act goes to the jurisdiction of the commis-

sion to make an award. The question is not jurisdictional in the sense that absence of willful misconduct must be affirmatively established by the claimant; the burden of proof is upon the employer to establish willful misconduct as an affirmative defense.

It has been held that willful negligence on the part of a workman constitutes no defense to a compensation claim. That misconduct of itself is not sufficient to bar a claim, *willfulness* being the essential element that must be established. It has been held that an employee who impulsively and without reflection attempts to clear sand off a moving belt, without stopping it, is not guilty of willful misconduct; that serious and willful misconduct is much more than mere negligence—that the mere doing of a thing in a careless manner or in a wrong way without intention to violate a necessary rule of safety or to do injury “is not willful misconduct.” Each case seems to be considered with reference to its own facts. In the case of *Harvey v. O’Neil* (5 Calif. Ind. Acc. Com. Dec. 28), where a taxicab driver at the request of a customer procured a female companion for the latter to take to a road house and drank intoxicating liquor with them, the testimony showing that the applicant was expected by his employer to be as accommodating as possible to his customers, it was held that where an employee acts in the scope of his employment and in accordance with directions, the mere fact that his conduct is reprehensible morally does not make him guilty of willful misconduct. When is a violation of law considered an act of willful misconduct? A deliberate violation of a speed law by an employee, causing injury, is serious and willful misconduct and may in certain instances take the injured without the scope of his employment, so as to bar the right to recover. The act of a messenger boy riding a motor cycle along a crowded thoroughfare in a large city, at a rate estimated between 40 and 45 miles per hour, without extreme necessity therefor, constitutes such a flagrant disregard for the rider’s own life and limb and bodily safety as to amount to willful misconduct. However, it has been held that the riding of an unlighted bicycle during the hours of darkness, contrary to the provisions of law, constitutes negligence rather than a circumstance taking the employee outside of his course of employment.

When is violation of safety rules of the employee willful misconduct? It is quite generally the rule that a workman violating a reasonable rule made for his own protection from serious bodily injury or death is guilty of misconduct. But he is not guilty of willful misconduct unless he deliberately violates the rule with full knowledge of its intent and the accompanying dangers. Where an employee intentionally and deliberately removes a safety device furnished to prevent just such injuries as he sustains, its purpose being well known to the employee, this surely constitutes willful misconduct. In such cases the nature of the act is one which involves deliberation and willful disobedience of a salutary rule, but a different situation is presented when an employee acts from sudden impulse. Tendencies to recover something falling, to reach for a hat blown off the head, and to perform many other acts, commonly denominated impulsive, give too little time for determination as to whether or not the movement should be made, and if the impulse to act is obeyed, even if the act is contrary to expressed directions

and results disastrously, it does not necessarily follow that it amounts to willful misconduct. A person in such a situation should not be judged by the same standards as one who breaks a rule under circumstances involving time for reflection and excluding the possibility of sudden impulse. A miner was killed while riding in a tub, a practice engaged in for the amusement of the employees. The appellate court held—and this was a compensation case—that since the practice had been going on despite the prohibition the injured should be allowed to show that the employer knew and winked at the practice, and compensation was allowed. The decision in this case in my mind seems to go pretty far, both as to it not being willful misconduct (realizing, of course, the effect of practice) and as to the accident arising out of the employment. Nevertheless, this very case perhaps best illustrates my personal opinion that the proper time for enforcing safety rules is not after an accident has occurred, by the reduction of compensation benefits.

Some acts provide an increase of compensation where the injury is received through the serious and willful misconduct of the employer. Frankly, if the law provides a reduction of compensation where the accident occurs through the willful misconduct of employees, it should provide for an increase in compensation where the accident occurs through the willful misconduct of the employer. What constitutes willful misconduct on the part of the employer? Quoting from California Jurisprudence, 27: "Willful misconduct involves knowledge on the part of the employer that he is doing wrong," but in order to prove the requisite act "it is not necessary that the evidence show positively that the employer was notified of the unsafe conditions of his premises. It is sufficient if it appears that the circumstances surrounding the act of commission or omission are such as evince a reckless disregard for the safety of others, and a willingness to inflict the injury complained of."

When our good friend, Mr. Stewart, requested me to discuss this subject it occurred to me that possibly he desired to direct attention to the weakness of those statutes, Oklahoma included, which made no provision for reduction or increase of compensation by reason of willful misconduct on the part of the employee or employer. After considerable research and investigation of the subject I have been driven to the conclusion it is at variance with those modification provisions; in brief, that one of the essentials and the basis for all compensation acts is that the injury must be *accidental*. If an act is not accidental, it is not compensable. It is accidental when it has an unexpected, untoward, uncalculated event. If, on the other hand, an injury results from a premeditated design or intention to bring it on, it can not possibly be accidental. It would therefore seem to me not to come within the pale and purpose of the compensation act. If an injury results from an accident, it should be compensated. If it results from obstinate and strong-headed purposes to self-inflict, compensation should be denied, and there in my opinion is the border line. Those provisions for reduction and increase of compensation by reason of willful misconduct open up a broad field for increased litigation. Perhaps my inexperience in dealing with cases where the law provides this decreased and increased compensation narrows my vision. This may not be pertinent to my subject, but it seems a

poor time to wait until after an accident occurs to enforce or impress safety rules upon the workman. It seems more like an avenue of escape for all or a portion of the compensation benefits.

Summing it all up, if the act of the workman which results in an injury is not done to produce the hurt, to get the pay, it may be considered misconduct or gross negligence, but not willful misconduct which would preclude recovery.

DISCUSSION

Chairman LEONARD. Mrs. Roblin sums up her paper with this: "Summing it all up, if the act of the workman which results in an injury is not done to produce the hurt, to get the pay, it may be considered misconduct or gross negligence, but not willful misconduct which would preclude recovery."

That made me think of a case which came before the Ohio commission last year, that of a motorman on a street car, who was in the vestibule thereof. In front of him was a man who had a truck loaded with cabbage, and who motioned to the motorman to take a couple, which he did. The man motioned to him to take a couple more. The motorman reached out and fell between the truck and the street car. We held that was not in the course of his employment, that it was not willful misconduct, but that he had just departed from his employment.

I should like to hear from Mr. Worstell, chairman of the Industrial Accident Board of Idaho, and have his discussion on this very important subject.

MR. WORSTELL (Idaho). In reading Mrs. Roblin's paper and looking over the various court decisions and the provisions with respect to willful misconduct, I found that apparently the border line changes, and moves about from place to place, depending on what State you are in when you consider the matter.

I did note this, however, that these cases seem to be divided into three general classes—those cases in which there is a violation of a statute, those in which there is violation of a statute and the rules of the employer, and those in which there is violation of the rules of the employer.

The English courts have laid down the rule that willful violation of a statute constitutes willful misconduct.

I noted the case of a miner who in the course of his employment fired a shot by means of a fuse and detonator, and retired to a place of safety. The shot missed fire. In contravention of the "explosives in coal mines order" he returned to the place of the shot in less than an hour, when the shot blew off in his face and permanently disabled him.

In another case a miner who was working with another in a certain level was sent by his colleague to get brattice nails. He went to a disused part of the mine, which was fenced off by a railing containing the words "No road," and was killed by poison gas. Brattice nails were procurable in an easily accessible part of the mine. The general regulations, made under the coal mines act, provided that no workman should go into any part of the mine other

than that in which he worked, and that no person should without authority pass beyond any fence or danger signal.

In both of these cases the English courts denied compensation.

In Illinois I find that a man employed to dump cars at the top of a mine tippie, who can not climb the stairs as fast as the car is hoisted, and who, with the implied knowledge of his employer, has been in the habit of riding the cage with the car, is within the scope of his employment in so doing, so that compensation must be paid under the workmen's compensation act if he is caught between the car and framework and killed, although it is a statutory offense to ride on a cage containing a car.

In Michigan a miner who crosses the bottom of a shaft instead of passing around the travel way, which act by statute is made a misdemeanor, is guilty of intentional and willful misconduct within the meaning of the workmen's compensation act, and no recovery can be had for his death by the fall of coal down the shaft as he is passing. Such reckless disregard of the statute and invitation of the very consequences the statute was enacted to avoid, being a voluntary act on the part of the deceased, involving plan and effort and calculation, and not being in furtherance of any of his duties or under the direction of his superior, constitutes intentional and willful misconduct on his part, and bars compensation to his dependents.

In this connection there is a very interesting case in the State of Georgia, where an employee driving an automobile failed either to stop at the railroad crossing or to get his car under control. The evidence seemed to show that he crossed the railroad crossing at a speed of about 50 miles an hour and was struck and killed. The lower court awarded compensation, but the supreme court of the State reversed it and said that the failure to observe the plain terms of the statute constituted willful misconduct on the part of the employee and denied benefits.

There are a number of cases where it is a mixed problem of willful misconduct when rules and statutes both are violated. The courts generally seem to hold that the mere thoughtless violation of an ordinance of the city—for instance, failing to stop at a stop signal—is not willful misconduct on the part of an employee such as would bar compensation.

The only difference between cases in which the act of the employee is violative of a public statute or ordinance, and those in which it is merely violative of a rule or instruction of the employer, is that where the rule transgressed is a statutory regulation the employee is bound by it even though he was unacquainted with it. He is presumed to know the law, but not the rules of his employer if they have not been stated to him.

It follows that the fact that the injury was received while violating some rule or instruction or statutory prohibition, or even in consequence of such violation, will not necessarily prevent it from being considered as arising out of and in the course of the employment.

New Hampshire, I understand, has no provision against willful misconduct. It decides on the question as to whether it arises out of or in the course of employment.

Mere violation of rules, when not willful or intentional, is not willful misconduct, within the meaning of the laws upon the subject

of workmen's compensation. There must be something more than thoughtlessness, heedlessness, or inadvertence in violating a rule of the employer, to constitute willful misconduct. There must be a willful breach of the rule or order.

We had a case in Idaho recently which was decided by our court against a mining company. This company was doing some excavating on the side of a very steep mountain. It had men and teams and a small tractor up there. Stewart was employed to drive the tractor. He was told by the foreman not to attempt to go up on the mountain side where the men and teams were at work until they had done some more work up there. In violation of that order, he started the tractor and drove it up the side of the mountain; it tipped over on him and he received injuries from which he died. When asked by the foreman why he did it, his only remark was, "I was trying so hard to do something." The supreme court decided it did not constitute willful misconduct.

The workman's case is strengthened where it appears that the rule is habitually disregarded, or its violation winked at by those whose duty it is to enforce it. Disobedience of a rule is not willful misconduct where the rule is habitually disregarded with the knowledge and acquiescence of the employer.

Ordinarily, however, the breach of an express rule or order will be held to be serious or willful misconduct as a matter of fact, particularly if such rule or order was made especially for the safety of the employee. I understand this to be the law in California, Michigan, England, Scotland, and Australia.

The violation of a rule against riding will not preclude the recovery of compensation where it appears that such rule is not enforced. That refers to riding on cars and also to a great number of the elevator cases where there were signs up, "For freight use only," and "Employees keep off," and things of that kind, where it is shown that the employees in spite of the orders have been riding the cars or using the elevators. It is not considered willful misconduct, at least in most jurisdictions.

It is not serious and willful misconduct if the rule was unknown to the worker; if the workman's ignorance of a rule is due to mere negligence on his part, then his violation thereof can not be considered "serious and willful misconduct."

In an English case the circumstances were that the workman was employed at a machine and it was part of his duty to clean the machine when necessary. Workmen were expressly forbidden to clean machines when in motion, and respondent was aware of this rule. He did clean the machine while it was in motion and was seriously injured in consequence. It was held that he was acting within the scope of his employment, although disobediently, and that he was entitled to compensation under the workmen's compensation act.

By the express terms of most of the American statutes, as in the case of the English statutes, no compensation is recoverable for injuries caused "by the serious and willful misconduct of the employee," except (in some jurisdictions) where the injury is permanent or fatal.

Mere violation of a rule does not always constitute willful misconduct. To have that effect the disobedience must have been deliberate, not merely a thoughtless act on the spur of the moment.

We had a case in our State which did not go up to the court, but was decided by the commission, which was unanimous in its decision. A lumber company doing some work on one of the rivers in northern Idaho was moving its equipment from a point up the river to one lower down, in which operation a number of boats were used. The workmen took the boats down the river where the current was very easily negotiated until they came to a place near some falls, where they went ashore and took all of their equipment out of the boats, as they were going to let the boats drift over the falls.

One workman, after the boats had all been unloaded, got in one of the boats and pushed off and said, "I will show you fellows how to ride over the falls." The foreman told him to come back, and said, "You will be drowned." They all implored him to come back, but he said, "No; I will show you how to ride the falls." In spite of the entreaties of his foreman and the warnings of his fellow workmen, he deliberately pushed off and went down over the falls, and neither the workman nor the boat was ever found.

The dependents filed a claim for compensation, but our board held that that was willful misconduct and the matter, as I say, has never been reviewed.

Misconduct is improper or wrong conduct. When improper conduct is intentionally and deliberately done, it becomes willful misconduct. It is true that willful misconduct means something different from, and more than, negligence. Willful misconduct by an employee, preventing recovery of compensation, involves an intentional, deliberate action, with a reckless disregard of consequences, either to himself or another—something less than self-infliction of injury, but greater than gross negligence or wanton carelessness. Willful misconduct is much more than mere negligence or even gross negligence. It involves conduct of a quasi-criminal nature, the intentional doing of something either with the knowledge that it is likely to result in serious injury or with a wanton and reckless disregard of its probable consequences.

That is taken from the opinion of *Aetna Life Ins. Co. v. Carroll* (Supreme Court of Georgia, 150 S. E. 208), which was the case of a man who was killed while crossing a railroad crossing where, under the statute, he must either stop or slow down to 10 miles an hour so that the car would be under control.

Willful misconduct includes all conscious or intentional violations of definite law or rules of conduct, obedience to which is not discretionary, as distinguished from inadvertent, unconscious, or involuntary violations. The conscious and intentional violation of a penal statute, which constitutes willful misconduct of the employee, is the conscious or intentional doing of an act which violates the statute, even though he be not thinking of breaking it. It has been said to involve conduct to which moral blame attaches, conduct of quasi-criminal nature, the intentional doing of something, either with the knowledge that it is likely to result in serious injury or with a wanton and reckless disregard of its probable consequences.

That seems to be one statement that most all the courts agree upon, that where a workman does something with an utter disregard of the consequences—for instance, this workman who was determined to ride the boat over the falls, while he might not have had in mind the idea that he was going to take his own life and probably did not intend to commit suicide, did do something in a reckless manner and with an utter disregard of all consequences—it must be labeled willful misconduct.

Mr. DUXBURY (Minnesota). I was much interested in this paper. Unfortunately I am inclined to find fault with some provisions of the Minnesota compensation law—probably you have noticed that—but this has convinced me that in this particular the Minnesota law is better than the laws generally seem to be. We have the idea that negligence of any kind should not enter into the question of compensation. It seems to me willful misconduct is nothing but willful negligence. It is a type of negligence, and provisions of that kind violate the salutary principle that negligence shall not be a defense for the right of compensation.

In Minnesota we have a different expression. In place of willful negligence, the expression is that compensation can not be recovered for injury intentionally self-inflicted, which covers suicide. There probably may be rare instances where the injury would be intentionally self-inflicted, but if the injury is not intentionally self-inflicted, it seems to me that compensation should be paid just as much as in any other case; you can not split up negligence into degrees and say that willful negligence, or any other expression which means a degree of negligence, should bar compensation.

We have had several cases where there is a violation of orders, and it is sometimes difficult to determine just when that sort of case should be compensable and when not. Ordinary violation of orders is simply doing the work in a manner a little different from that in which it was directed to be done, and nobody follows such directions exactly. Many times this is necessary under the circumstances, and a mere violation of orders which relates to the manner of doing the work ought not to defeat compensation; but there is such a thing as an order which defines the scope of the employment, and when the man violates such an order, then the injury which occurs arises outside of the employment. That is a distinction which we find no great difficulty in making. When there is violation of an order simply with regard to the manner of doing the work, I see no fundamental reason why compensation should not be paid. When an order which defines the scope of employment is violated, that is different.

If the messenger boy assumes to go down and run the power engine because he thinks it ought to be run, he is outside the scope of his employment and violates that order; but any injury which arises within the scope of his employment, unless it is intentionally self-inflicted, is compensable with us, without regard to the degree of his negligence.

Chairman LEONARD. What do you do in cases of horseplay?

Mr. DUXBURY. Horseplay on the part of both parties? They are not hired for horseplay and an injury arising out of horseplay does

not arise out of employment. They were not hired for that any more than that fellow of yours was hired to steal cabbage.

Chairman LEONARD. How about the innocent victim?

Mr. DUXBURY. If he is not indulging therein, that is a hazard of employment.

Mr. WORSTELL. Do you have any provision whereby you reduce the compensation of a workman who violates the rules?

Mr. DUXBURY. None whatever.

Mr. HALFORD (Ontario). What would you do in a case where a railway engineer was given a specific order to stay at a railway station, and he doesn't do it and an accident ensues?

Mr. DUXBURY. I should be under the painful necessity of refusing compensation.

Mr. HALFORD. We had that specific case not two months ago. A boy who went out of the office to do something wanted to see if the machinery would run, and he attempted to put the belt off the idle pulley and got his arm caught and cut off.

Chairman LEONARD. Don't you have to be a little more considerate of the immature boy? Boys will be boys.

Mr. HALFORD. He was 18 or 19. We thought he was old enough to understand he should not monkey with a piece of machinery he knew nothing about and from which he had specific orders to keep away.

Mr. DUXBURY. He was doing something he was not hired to do.

Chairman LEONARD. I think we could devote some time to questions arising out of this very thing, but we must get along.

The next paper will be by Mr. R. J. Hoage, deputy commissioner United States Employees' Compensation Commission, on How the Workmen's Compensation Law is Working in the District of Columbia.

How the Workmen's Compensation Law is Working in the District of Columbia

By R. J. HOAGE, *deputy commissioner United States Employees' Compensation Commission*

The District of Columbia was one of the last of the Commonwealths in the United States to be vested with authority to establish a workmen's compensation law. Forty-three of the States had preceded the District of Columbia in passing such legislation.

For several years the type of a compensation law for the District of Columbia was the subject of much controversy. Labor demanded a compensation law which in its opinion would curtail or eliminate the cost of civil suits in contested cases and give greater benefits to the claimants, and recommended a compensation law which would provide the establishment of a fund. The employers in the District of Columbia were not favorable to a fund for various reasons, but advocated an insurance law providing for the securing of payment of compensation by insurance companies and allowing the privilege of self-insurance. These and other questions were argued by the

employers and employees for some seven or eight years and in the end they were in no closer agreement than before.

Finally the longshoremen's and harbor workers' compensation act, approved March 4, 1927, which had been drafted to cover the class of employees named in the title of the act, was selected to answer the purpose of a workmen's compensation act for the District of Columbia. This act was adopted by Congress and approved May 17, 1928, to be effective July 1, 1928. Thus without changing the text of the law, with the exception of making it applicable to industrial wage earners not already covered by the Federal compensation act or by the longshoremen's and harbor workers' compensation act, it was passed for the District of Columbia.

Inasmuch as this law was not drafted particularly for the District of Columbia, some of the features have been difficult to apply, but on the whole it has been working very satisfactorily. The difficulties have been ironed out as they have arisen, and through the courtesy and cooperation of the insurance companies many of them are fading into insignificance. The law has been fairly well established in the courts because it is the law of New York with a few changes, and the rulings of New York State have been of great assistance in the administration of the law. Had it not been for these decisions and the establishment of procedure under the longshoremen's and harbor workers' act, many more difficulties would have been encountered.

Administration of the Act

The administration of the act is placed in the hands of the United States Employees' Compensation Commission, which in turn is authorized by the law to appoint from the register of the Civil Service Commission, a deputy commissioner, whose duties are set forth in the act and who under the general supervision of the Employees' Compensation Commission administers the compensation law. The commission is required by the act to provide all necessary help, quarters, supplies, and equipment, and to prepare necessary regulations and procedure; it is also custodian of the fund under section 44. All compensation cases are passed upon by the deputy commissioner, whose order is final on questions of fact, but where any party of interest is dissatisfied and believes the decision is not in accordance with law or the evidence adduced, he may appeal from the decision to the District of Columbia Supreme Court within 30 days from the date of the order.

Coverage and Injuries Reported

During the first year of the administration of the law in the District of Columbia it was found that some 15,000 employers were subject to the provisions of the law, and the injuries reported for the first year numbered 14,295, of which 59 were deaths. During the second year there were 19,412 injuries reported, 56 of which were deaths. The large number of injuries reported has been especially surprising because the District of Columbia was not generally regarded as an industrial commonwealth.

The reports at the present time show that the Sanitary Grocery Co. has submitted the largest number of reports, the Washington

Gas Light Co., the Potomac Electric Power Co., and the Chesapeake & Potomac Telephone Co. following in their respective order. Much the greater portion of these reports represents minor injuries.

In settling of cases during 24 months formal hearings were held in 211 cases, or approximately seven-tenths of 1 per cent of all cases reported went to hearing. Out of the 211 hearings here there have been 12 appeals. Eight of these were dismissed by the court, four are still pending, and three of these pending cases are now filed in the court of appeals. The courts have demonstrated a comprehensive understanding of workmen's compensation in their handling of these appealed cases, and have been very careful in their decisions thus far.

Payment of Compensation

Provision is made for payment of compensation on the fourteenth day from the date the employer has knowledge of the injury, and the basis for this compensation is $66\frac{2}{3}$ per cent of the average weekly wage, with a maximum of \$25 and a minimum of \$8 per week. The maximum amount of compensation in any one case is \$7,500, which includes burial expenses. The law also provides penalties as follows: A penalty of 10 per cent where compensation is not paid within 14 days after it becomes due; 20 per cent if not paid within 10 days when by the terms of an award compensation becomes due; and a fine of \$100 when the employer fails to furnish notification of final payment within 10 days.

Third-Party Liability

In third-party cases in most compensation laws, the acceptance of compensation operates as an election, and all rights of the claimant are subrogated to the employer. Under the District of Columbia act the largest number of third-party cases reported are from minors working as newsboys and messenger boys for telephone and telegraph companies, etc. Owing to the lack of knowledge of this provision of the act and the vagueness of its construction, there has been considerable difficulty in the handling of these cases. Many times the claimant, thinking he has the right to make settlement, has done so and the amount has not been adequate. The act gives the deputy commissioner considerable authority in filing the election for a minor. This authority is rarely exercised, however, except with the consent of the parents. If there is no parent and the case demands immediate action, such election has been filed in order to protect the rights of the claimant.

Special Fund

Under section 44 of the act a special fund is provided which is built up from the \$1,000 payments required of insurance carriers in those death cases in which there are no beneficiaries. Also certain penalties are placed in this fund. Up to the present time there have been 11 death cases where there are apparently no beneficiaries. In five of these cases \$1,000 has been paid into the fund, making a total of \$5,000 from such source. There are six more to be paid when the limit of one year for filing claim expires.

Unless the evidence is definite and clear that there are no beneficiaries, the insurance companies prefer to take one year from the date of injury, which is the statutory limit for filing a claim, in order to protect their rights, before making payment of \$1,000; but where the evidence is substantial, the insurance companies have not availed themselves of this privilege but have made their payments at once.

This fund is established for the purpose of providing rehabilitation, compensation for increased disability, and for prosthetic appliances. The law provides, in cases of rehabilitation, payment not to exceed \$10 per week to assist the claimant in his expenses while securing training. It also provides for the purchase of prosthetic appliances where the same are approved by the commission. In case of a second injury causing permanent total disability, the employer is liable only for the actual amount provided under the act for the injury itself, and the excess amount for the increased disability is paid out of said fund.

Some of the Difficulties Encountered

Some of the greatest difficulties encountered in the administration of the law are through failure to make proper reports of cases. An employer who has secured the coverage because he has been compelled to, and who perhaps employs only a part-time laborer, usually is not versed in the provisions of the compensation act. He has had no forms and in almost every instance has not even read the provisions of the compensation act. Therefore, when an injury arises he does not know just what to do and it is impossible to carry on a campaign to the extent of informing everybody who might employ any help in the District of Columbia. The definition of an employer is held to mean every person carrying on any employment in the District of Columbia and the term "employee" is held to mean every employee engaged by such employer and the exclusions are those employees engaged in agriculture, domestic service, or any employment that is casual and not in the usual course of the trade, business, occupation, or profession of the employer. This large scope of coverage makes it very difficult to secure the proper reporting of cases on part-time employees and brings up many complicating questions on account of the close relation of part-time employees in many of the occupations and casual laborers. This also makes it necessary, in the case of part-time employees, for a number of employers to carry coverage on the same employee. Coverage is not on an individual employee, but is to secure the payment of compensation under the provisions of the act, and when two or three law firms employ the same stenographer it makes it necessary for each one of them to pay a minimum premium. This difficulty has been somewhat obviated by one firm being recognized as the employing agency and contract for stenographic service being made between the original employer and the other affiliated firms. There are benefit societies in the District of Columbia who charge 5 cents a week for their benefits and all the treasurer or secretary receives is his own dues, and it is a very perplexing situation when the organization is compelled to pay a minimum premium for such service. There has been some difficulty encountered over insurance companies attempting to avoid certain risks. One particular instance is where an employer would

have had to pay a premium double the amount of his contract price to have secured a policy of coverage, and he claimed to have been engaged in his occupation for some 30 years without having had a serious injury. There are other industries, such as window cleaning, where the rate has been almost prohibitive, and many employers have been compelled to take their employees into partnership so that they would not be compelled to carry an insurance policy. There have also been some of the small delivery trucks where the earnings were very low and the minimum premium was so high they were unable to carry insurance, and in numerous instances truck drivers have taken their employees into partnership and under a signed agreement filed in the office of the commission proceeded with their work without employing any help.

It is also sometimes very difficult to determine when a person might be a domestic servant or an employee under the meaning of the act. For instance, where a party keeps roomers in his home and hires servants, it is some question whether the employee, while engaged in the quarters of the employer, is a domestic servant or an employee within the meaning of the act. There are also many problems arising with reference to the question of jurisdiction when people living in the adjacent territory, namely, Virginia and Maryland, and doing some work in the District of Columbia and some on the outside, are employers within the meaning of the act. These questions as they have come up have been very agreeably settled through the courtesy of the commissions of the States of Maryland and Virginia, and there have been the most pleasant relations between the two States and the District of Columbia.

I should like to state here that perhaps we have a unique situation because we are a small territory. A great many of the employees and employers who live in the adjacent territory come into the city of Washington day after day to carry on their employment. These same employers use these employees in and out of the District, so it is difficult to tell whether they are employees of the District of Columbia, or of Maryland or Virginia.

Another embarrassing situation which has probably come to all compensation law administrators to a large extent is the subrogated right in a third-party case. Many times the claimant in the case will not decide for days, weeks, or months what action he desires to take. The insurance companies, not knowing whether they have a subrogated right, because the claimant has not made an election have been embarrassed for several reasons. First of all, the question of medical attendance and the securing of proper medical treatment is involved, and the claimant may secure medical services which are incompetent and which unnecessarily prolong the duration of disability and many times increase the permanent partial disability. Second, in all cases where a third party is involved, the sooner an investigation can be made the easier it is to establish the liability, and because of the fact that the claimant fails to elect, the insurance companies many times are embarrassed. Third, where a minor is involved, the question of election presents a new series of problems which involves guardianship, election, and complications in subrogated rights.

It is not believed that the District of Columbia compensation act from an administrative standpoint presents many more complications than naturally arise under the administration of any new act. The cooperation of the insurance companies has been very marked and where the inconsistencies of the law have been realized they have held a generous attitude and have been willing to meet the administration on an even footing. There is no large number of amendments being requested at this time so far as the administration is concerned. Questions of the type of a compensation law is being left entirely to interested parties and only such questions as affect the administration of the law will be suggested by this commission.

Medical Treatment

The question of medical attention under all compensation laws raises many problems. It is to the insurance company's best interests to provide the best medical attention that can be secured because it is cheaper and more satisfactory in the end. The law places the responsibility of medical treatment upon the employer and his selection of a physician is authorized and the burden is placed upon the insurance company until it dismisses such physician and brings its own facilities into use. The larger employers in the District of Columbia make adequate provision for medical treatment and there is very little trouble encountered in cases coming from these sources. However, there have been numerous disputes in which a family physician begins the case and is asked to release it in favor of some other physician who represents the employer or an insurance carrier. When the medical report in the case seems to be inadequate the law makes provision for a special examination by an independent physician and this has in a large measure produced good results. The approval of medical fees has been somewhat difficult because there is no definite fee schedule established in the District of Columbia; the law provides for a fee in accordance with the standard of living of the injured employee and the standards of living vary so it destroys to a large extent the possibility of a definite fee schedule. However, it is believed that in the average case of an employee in the District of Columbia the minimum fee should be applicable and the physicians have largely accepted the approval of such fee by the deputy commissioner. While there have been some bills which seem to be extremely high, they have mostly been settled after a careful investigation has been made and a reasonable fee has been approved. Doctors who have been enthusiastic to make a good showing for the companies by whom they have been employed, and have rendered medical reports minimizing the degree of disability, have found themselves in an embarrassing position when a special report has been called for from an outside physician of high standing and the estimate of the disability found to be incorrect. In such instances we have assessed the cost of the special report and examination to the insurance carrier or employer, and usually under such circumstances the next report that is rendered has been correct.

I might say in addition to this that the method of asking for special reports has produced a rather salutary effect. Whenever the

deputy commissioner is not satisfied with the medical report, it has always been his plan and purpose to call for a special examination. This in itself has a tendency to hold medical men in line on rendering reports.

In one particular instance I had a case where a doctor said there would be no permanent disability of the hand. It was obvious even from a layman's standpoint that it was a permanent disability case. I immediately sent the man to a specialist in the city for examination and requested the specialist not to mail me the report but to appear in person and give his testimony at a hearing. His report was quite at variance with the insurance company's report. Doctors reported on each side, so to satisfy myself I sent for another specialist to appear at the hearing, and I approved the fees in the matter of \$50 each for examination. It rather cured the insurance companies of bringing in inadequate reports.

That is the principal way we have of handling medical reports. I gave you only an exceptional case because usually when it has been understood that this is the way of handling cases, the reports have come in all right.

Another advantage I have that most of you do not, is to be called upon to speak before the medical society. I have had before me two or three hundred doctors in the District of Columbia and have advised them what action is to be taken and how to handle the work, and they are cooperating beautifully with us in the administration. Many problems are easier for us because of the close proximity of both legal and medical advice. We can step to the telephone and call anybody we want in just a moment, and that makes it much easier than with you gentlemen who have to travel over a State a couple of thousand miles to get into conference with the other people.

Chairman LEONARD. I want to thank Mr. Hoage for his complete picture of the operation of the law in the District of Columbia. I think a number of the commissioners here rather envy him his position for I do not think he has quite so many troubles as the rest of us.

The next subject is one which is very important to every man, every commissioner, and every insurance company in the United States—Classifications and Accident Reports as a Means to Reasonable Compensation Insurance Rates, by Mr. Gregory C. Kelly, general manager of the Delaware-Pennsylvania Compensation Rating and Inspection Bureaus.

Classifications and Accident Reports as a Means to Reasonable Compensation Insurance Rates

By GREGORY C. KELLY, *general manager Delaware-Pennsylvania Compensation Rating and Inspection Bureaus*

The reasonableness of compensation insurance rates is measured by the extent to which they accord with the cost of work accidents. In order to test this agreement between rates and cost the experience of an entire State (or the area governed by any single compensation act) must be assembled by premiums and accidents. The premiums thus assembled represent the aggregate of the premiums of indi-

vidual risks just as is the case with the work accidents. To tabulate these premiums and accidents so that the proper rate deductions may be made therefrom requires some system of risk classification.

Industry classifications for workmen's compensation insurance are an outgrowth of former liability times, and perhaps from that very fact have the sanction of usage rather than logic for a basis. The only improvement from time to time has been the discontinuance of individual classifications which proved to be discriminatory or too insignificant to retain rate-making identity. Speaking of Pennsylvania and Delaware, since they are the States of which I have first-hand knowledge, there are now a few less than 200 classifications with separate premium rates. These 200 classes have developed over 14 years—back in 1916, when the Pennsylvania compensation act became effective, there were more than 1,000 classes. It would seem that the 200 classifications are producing dependable rates, since the aggregate loss ratio for Pennsylvania and Delaware during the whole period, 1918 to the end of 1928, has been 61 per cent. Since the rates were pitched at a 60 per cent loss ratio the result of 61 per cent appears to substantiate the rate-making procedure.

To continue with the discussion of classifications, these 200 Pennsylvania and Delaware classes are product and industry classes. Cement manufacture, brick manufacture, and hosiery and knit-goods manufacture are examples of what we mean by product classifications. Electric utilities operations; coal, fuel, and material dealers; and hotels and restaurants are examples of industry classifications. In each of these classifications the same rate applies to the whole operative pay roll; the office force and outside salesmen alone are separated at different and lower premium rates. Antidiscrimination is the purpose of such a classification system. No member of an industry has or should have an advantage over his competitors because of compensation for work accidents, save as his own experience or the condition of his manufacturing equipment warrants deviation from the industry rate. This uniform industry rate rests on the fact that work accidents pertain to the industry in which they occur, so that the immediate employer is merely the agency through which compensation is paid, while the cost of accidents, like the other costs of the industry, is in fact borne by the consumer. With this view of the distribution of compensation cost it is fair to group industries of similar character and to give them a common rate in order to secure a sufficient volume of experience. This volume of experience is sufficient if the rates produced by it exactly meet the accident cost without wide fluctuations from year to year. Industry can progress confidently under such a system—the approximate cost of accidents may be anticipated over a long period, the premiums are not wasteful, and all who are engaged in a like business have a like amount to include with the other costs of enterprise.

It must be borne in mind that any classification system must of course follow the industries of the administrative area in which the compensation act is applied, since the same industry differs materially by location. Industries are commonly concentrated in small areas, and in these concentrated areas they are organized efficiently as compared with the sporadic operation of the same industry in

scattered localities. Pennsylvania, for example, has some half of the stone quarries of the country. Together with Massachusetts, Pennsylvania and Delaware divide a large part of the leather industry. The coal, oil, steel, cement, and fire-brick industries of Pennsylvania have shaped the course of these industries in the United States. Similar concentrations occur in the glove industry of New York, the pottery manufacturing of New Jersey and Ohio, and the furniture and automobile manufacturing of Michigan. Dependable rates can easily be made for these concentrated industries—in fact, the preponderance of workers and work accidents enforces a premium rate commensurate with the cost, providing always, of course, that such rates are made for the whole industry and not for divisions of the industry.

Illustrative of the matter of revisions, a plant engaged in shipbuilding had divisions of pay roll for the foundry and machine shop. The result of those divisions had no effect on the premium of the risk because it was rated from its own experience. The shipbuilding was the major classification. As you read the accident reports, they sound like shipbuilding. The result of the division was the addition of two or three million dollars of pay roll to the foundry classifications and the machine-shop classifications, with no corresponding accidents, because the accidents had all been assigned to shipbuilding, which was obviously no benefit to the particular employer but rather a decrease in the rates for machine shops and foundries throughout the State of Pennsylvania, a decrease which they themselves had not earned.

Given a classification system developed from inspection and study of individual risks with rates revised annually on a statistical basis, the application of the classes is the next step. The classes must be applied in the same way that the rates were developed. If, for example, the classification—and therefore the rate—for bakeries includes the stores, it is essential that no pay-roll division be permitted for stores in connection with the insurance of bakeries. To insure uniform application, classifications as well as rates must be published for individual risks and the insurance policies written must be checked against the published classes for each employer. It has proved necessary also to check the audits at the end of each policy period, particularly since these audits provide the pay-roll basis for each succeeding classification and rate revision.

The other side of the rate-making procedure is the question of compensation cost, which is arrived at by means of accident reports. It is obvious that any audit of accident cost necessitates individual reports of accidents by nature of injury, reports which will show the part of body and the extent of injury as well as the payments of compensation and medical costs. The fact that the accident reports show in detail the cause of the accident, the location of its occurrence, and the occupation of the injured person permits a complete check of both the classification of the risk and the accident assignment. Secondary only to their value in checking industry classifications is the value of accident reports in estimating the cost of compensation-act amendments. The individual cases can be revalued as though they had occurred under the benefits of an amendment in such precise

detail that a very close estimate may be had in advance of legislation as to the cost of a proposed measure. Also, the revaluation is invaluable in forecasting the insurance rates necessary to cover the cost of a new or amended compensation act.

An amendment to the Pennsylvania compensation act, effective January 1, 1928, increased the nominal rate of compensation from 60 per cent to 65 per cent of wages. It increased the minimum weekly compensation from \$6 to \$7 and the maximum from \$12 to \$15. The waiting period was decreased from 10 to 7 days. Funeral benefits were increased. To evaluate this change some 15,000 accidents were individually recomputed in accordance with the new benefits—3,500 cases of death or permanent total disability, 5,000 cases of major permanent disability, and 6,000 cases of minor permanent disability. Wages and duration of disability were tabulated for nearly 200,000 cases of temporary disability. These were the accidents of 1922, 1923, 1924, 1925, and 1926, policy years used for 1928 rates. The increase in cases of permanent disability was calculated to be 21 per cent. Checked a year later against the 1928 accidents the computation was substantiated, as 20.4 per cent was the actual increase. A 36 per cent increase was calculated for compensation of temporary disability accidents. Later tabulation of the 1928 cases indicated the actual ratio to be 1.35. The other compensation act amendments—those of 1920 and of 1923—occasioned similar calculations, and in view of these several amendments it seems reasonable to believe that the long period loss ratio mentioned earlier in this paper points to the dependability of amendment valuations computed from individual reports of accidents.

The essentials of rate making for compensation insurance, as this problem has been worked out in Pennsylvania and Delaware, comprise the classification system, the individual reports of pay roll and premium, and the individual reports of accidents. A logical industry classification system is primary in its importance, since no amount of accuracy or effort can produce reasonable rates for unreasonable classifications. Given such a system and the needed detail in pay-roll and accident reports, rate making is simplified. The processes and the rates themselves may be explained so that insurers and supervising officials alike can depend with confidence upon the resultant premiums.

DISCUSSION

Secretary STEWART. As to this matter of premium rate making I want to ask some questions. If Mr. Kelly or anybody else can answer them, I should like to have them answered.

I have had compiled the premium rates on occupations in the building trades. The compilation covers some dozen or more particular occupations, but for the sake of brevity I have selected the occupation of structural-steel workers. I think we will all agree that the hazards of structural-steel workers are practically the same everywhere. If a fellow falls off a 16-story building in Salt Lake City, he hits the ground just as hard as if he had fallen off a 16-story building in New York.

Relativity of compensation premium rates and of wage rates for structural-steel workers, June 30, 1930

UNITED STATES

State	Premium rates		City	Wage rates		Comparative benefit costs (based on New York costs) ¹
	Per \$100 of pay roll	Per cent of New York rates		Per full-time week	Per cent of New York rates	
Alabama.....	\$11.75	50.1	Birmingham.....	\$55.00	71.4	57.1
Alaska.....	13.83	59.0	Tucson.....	55.00	71.4	62.6
Arizona.....	33.67	143.6	San Francisco.....	55.00	71.4	103.1
California.....	20.01	85.3	Denver.....	55.00	71.4	78.2
Colorado.....	12.17	51.9	New Haven.....	66.00	85.7	56.9
Connecticut.....	17.49	74.6	Wilmington.....	66.00	85.7	77.1
Delaware.....	6.50	27.7	Washington.....	66.00	85.7	58.5
District of Columbia.....	19.26	82.1	Atlanta.....	55.00	71.4	96.1
Georgia.....	15.54	66.3	Boise.....	49.50	64.3	60.9
Idaho.....	20.06	85.5	Chicago.....	71.50	82.9	68.7
Illinois.....	14.58	62.2	Indianapolis.....	68.80	82.9	76.3
Indiana.....	14.15	60.3	Des Moines.....	55.00	71.4	72.2
Iowa.....	11.31	48.2	Kansas City.....	52.50	68.2	60.3
Kansas.....	12.35	52.7	Louisville.....	55.00	71.4	74.6
Kentucky.....	12.01	51.2	New Orleans.....	55.00	71.4	64.2
Louisiana.....	14.58	62.2	Portland.....	55.00	71.4	74.1
Maine.....	12.67	54.0	Baltimore.....	66.00	85.7	82.2
Maryland.....	15.01	64.0	Boston.....	60.50	78.6	83.0
Massachusetts.....	14.93	63.7	Detroit.....	66.00	85.7	71.4
Michigan.....	14.74	62.9	Minneapolis.....	55.00	71.4	78.7
Minnesota.....	22.26	94.9	St. Louis.....	70.00	90.9	90.5
Missouri.....	17.33	73.9	Butte.....	55.00	71.4	90.1
Montana.....	16.07	68.5	Omaha.....	49.50	64.3	60.8
Nebraska.....	22.54	96.1	Reno.....	55.00	71.4	79.2
Nevada.....	12.07	51.5	Manchester.....	55.00	71.4	88.3
New Hampshire.....	13.60	58.0	Newark.....	75.00	97.4	57.1
New Jersey.....	10.99	46.9	Albuquerque.....	55.00	71.4	85.0
New Mexico.....	23.45	100.0	New York.....	77.00	100.0	48.4
New York.....	16.27	69.4	Winston-Salem.....	55.00	71.4	100.0
North Carolina.....	11.00	46.9	Fargo.....	55.00	71.4	95.7
North Dakota.....	10.00	42.6	Cincinnati.....	61.60	80.0	81.6
Ohio.....	16.08	68.8	Oklahoma City.....	55.00	71.4	77.1
Oklahoma.....	15.90	67.8	Portland.....	60.50	78.6	76.5
Oregon.....	6.50	27.7	Philadelphia.....	66.00	85.7	61.3
Pennsylvania.....	13.33	56.8	Providence.....	55.00	71.4	71.5
Rhode Island.....	16.64	71.0	Aberdeen.....	55.00	71.4	73.6
South Dakota.....	12.65	53.9	Memphis.....	55.00	71.4	59.9
Tennessee.....	19.97	85.2	Dallas.....	55.00	71.4	76.5
Texas.....	15.00	64.0	Salt Lake City.....	49.50	64.3	75.2
Utah.....	10.23	43.6	Burlington.....	60.50	78.6	54.8
Vermont.....	9.13	38.9	Richmond.....	60.50	78.6	60.9
Virginia.....	15.25	65.0	Seattle.....	55.00	71.4	73.6
Washington.....	8.40	35.8	Wheeling.....	60.50	78.6	82.8
West Virginia.....	14.38- 18.09	61.2-77.1	Milwaukee.....	52.80	68.6	95.8
Wisconsin.....	21.73					60.9
Wyoming.....						

CANADA

Province	Premium rates		Wage rates	
	Per \$100 of pay roll	Per cent of New York rates	Per full-time week	Per cent of New York rates
New Brunswick.....	\$3.00	12.8	\$35.00	45.4
Nova Scotia.....	6.00	25.6	48.00	62.3
Ontario.....	7.00	29.8	44.00	57.0

¹ Compiled as of Jan. 1, 1929, by National Council on Compensation Insurance. See U. S. Bureau of Labor Statistics, Bul. No. 511: Proceedings of sixteenth annual meeting of International Association of Industrial Accident Boards and Commissions.

² Plus service charge based on size of premium.

Taking this specific occupation of structural-steel workers we find that New York has a premium rate of \$23.45 per hundred dollars of pay roll, which at the present union rate of wages in New York City means \$3.60 a day per man. For the same occupation we find all sorts of rates, the lowest premium rate being for Pennsylvania where the premium is \$6.50 per hundred dollars of pay roll, or only 27.7 per cent of the New York rate. However, the wages of structural-steel workers in Philadelphia are 85.7 per cent of the wages for the same occupation in New York City.

What is there in the law that spells such a striking difference in the premium rate for compensation insurance upon an identical occupation?

In New York the percentage of wages paid for permanent total disability is $66\frac{2}{3}$ as a maximum, with a limit of \$25 a week; in Pennsylvania it is 65, with a limit of 500 weeks and a weekly maximum of \$15 and a total maximum of \$6,500.

In New York for permanent partial disability we have $66\frac{2}{3}$ per cent of the wages as against 65 in Pennsylvania and we have 312 weeks as the maximum as against 300 in Pennsylvania.

For temporary total disability we have $66\frac{2}{3}$ per cent of the wages in New York with a weekly maximum of \$25 and a maximum amount of \$5,000; in Pennsylvania we have 65 per cent with a limit of 500 weeks, and a weekly maximum of \$15 with a limit of \$6,500, or \$1,500 more than in New York.

I am simply comparing the highest State premium rate with the lowest State premium rate on a definite occupation, and I should like to ask what is there in the situation which requires nearly four times the premium rate in New York that is required in Philadelphia, nearly twice the premium rate in New York that there is in Portland, Me., why Baltimore has a premium rate of 64 per cent of the New York rate, whereas the wages are 85.7 per cent, why in Tucson, Ariz., the premium rate is 143.6 per cent of the New York rate or \$33.67 per hundred dollars, whereas the wage rate is 71.4 per cent of the New York wage rate.

If we reduce the matter to hours actually engaged in the occupation, the New York employer pays 45.22 cents per hour in compensation insurance premium for each hour that a structural-steel worker is actually employed; in Philadelphia he pays 9.75 cents per hour. That is to say, the combination of higher wages, shorter hours, and difference in insurance premium rates combines to make an insurance cost on an identical occupation practically five times as much in New York City as it is in Philadelphia.

I do not wish to be misunderstood. These questions are asked not in a spirit of criticism, but if possible to bring out in a way that can be understood by the layman the reason for the wide discrepancies in premium rates.

Chairman LEONARD. I think Mr. Stanley has a discussion on this paper.

Mr. STANLEY (Georgia). This morning Major Allen delivered quite a good paper and there was some discussion on it which was very interesting. We have never had quite the experience in Georgia which he seems to have had with physicians, although probably the most reputable bone specialist we have, a man of

considerable reputation all over the Southland, refuses absolutely to give the commission any positive information regarding the degree of permanent disability a man may have, and of course his testimony is absolutely worthless to us. He won't do it in private practice. He won't give a patient any positive information; he says, "I don't know," and it ends right there.

As to lawyers, we had a case the other day where one of the other commissioners was insulted by an attorney. I am frank to tell you that, while I do not believe we have the authority, I would have put that man in jail, though some judges might have turned him out after he got there.

As to willful misconduct, about which something was said, we had three cases in Georgia. The gentleman referred to one, that of a man who was injured by a train. The train did not run over him, but he ran into the train. He went right on and ran into the train and hit it like that [indicating]. The commission thought that man was not entitled to compensation. If he had not been traveling so rapidly, he could have stopped long before he got to the train.

In another case a janitor, having nothing whatsoever to do with the job except in connection with the building, picked up a live wire that had fallen on a fence, after being warned not to touch it. We denied his widow compensation because we did not think that that arose out of and in the course of this man's employment.

In another case an employee rode on the fender of an automobile, after having been instructed by his immediate superior, who was the driver of the truck, not to do so, but the driver allowed the man to stay and ran on, and the man was thrown off and killed. We said that that was not willful misconduct. You can not make a rule and permit it to be violated and then claim enforcement of the rule.

Up to last year the comptroller general of the State of Georgia, who is ex officio insurance commissioner, was given no machinery with which to carry out his duties with reference to rate making. Last year, however, the legislature passed an act permitting the industrial commission to give the use of its machinery to the insurance commissioner if he requested it. He asked the commission to furnish him with the machinery and we did so gladly.

He notified all the insurance companies to report to the commission on each case, showing every bit of compensation paid, all hospital bills paid, and everything so that he could take each individual case and analyze it and fix a rate.

The insurance commissioner is only theoretically an expert on insurance matters because his work is that of comptroller general, but he appointed a very efficient, capable, and fair-minded man as deputy commissioner. That is the situation we have in Georgia at the moment. Our relations are very pleasant. We do the work for him just as he wishes it done, and when it comes to making rates, he will have everything right in front of him, and will not have to guess or to accept the figures furnished without an analysis.

As soon as that law passed, rates in Georgia were reduced 21½ per cent by the insurance authorities. I do not charge they did that because of the passage of the law. I think it would have come around

in the natural course of events, but the fact is the rates were decreased immediately on the passage of the law. In the spring we will begin to get the information the insurance commissioner will need for rate making, and we will furnish him with everything he wishes.

Mr. KELLY (Pennsylvania). If I may reply to Commissioner Stewart's inquiry as to a difference in rates, I can speak with authority only for our Pennsylvania rates. In Pennsylvania we use a five years' average. We audit the pay-roll reports for structural-iron workers. We examine the individual accident reports as they come in, and we are confident that the reports assigned to iron erection are accidents to ironworkers. The rates which result from that can be defended, but I should hesitate very much, not knowing the underwriting methods in detail used in New York or other States, to say that their rates could be compared with ours, because the underwriting principle is a somewhat different one. Pennsylvania classifications are intended to cover the whole business of the employer. The structural-iron classification, for example, would include trucking of that material from the station to the point where it was to be erected, if that was done by the structural-iron contractor. A broad classification of the rates is very difficult without an analysis of the underwriting methods under which the rates were derived, if they were derived from experience, and I believe they were.

Secretary STEWART. What we are interested in is what we have to pay for the man who gets hurt. If by differences in underwriting methods you make it cost five times as much to insure a workman in New York City as it costs in Philadelphia on precisely the same kind of job, then you are dealing, not with the hazard of the man on the job, but with underwriter insurance company methods.

For another instance, take the risks that the insurance companies refuse to accept at all—the window cleaners, for instance. Where there are State funds, even if they be competitive State funds, the State fund is obliged to take such risks—there is no way out of it; and because the funds felt that they did not have access to genuine pay rolls in the case, they set an arbitrary amount of a dollar a day per window cleaner, and the rate for window cleaners is the same in Chicago that it is in New York.

The mutual insurance companies began to take in the window cleaners, and wherever a window cleaner is insured at all, a dollar a day is paid for him. I think that is practically universal throughout the United States where there is any coverage at all.

That risk is not carried by the stock-insurance companies, of course. The occupations of structural-iron workers and window cleaners are not very dissimilar, so far as hazard is concerned. On examination of the records of the State of New York and other places where we made an investigation of the hazards of window cleaning, we found that the hazard was not very great. It is not such a terribly dangerous occupation, so far as the record goes. The idea that a window cleaner is liable to fall and be killed is all nonsense. The death rate is not so great among window cleaners as it is among a lot of other occupations which the insurance companies do cover.

Now, if it is simply a guess—you pay a dollar a day for window cleaners and yet are making money out of it—it may be all right, and Mr. Kelly thinks it is, but I believe it is up to the insurance com-

panies to show us what sort of data they use in constructing a rate of \$23.45 on structural-iron workers in New York and a rate of \$19.26 in Washington, D. C. Is there any justification for such rates, and if there is justification, what is it?

Mr. DUXBURY. I always hesitate even to question the conclusions of Mr. Stewart, because anyone who does generally gets the worst of it, but I have been chairman of the compensation insurance board in the State of Minnesota, which is the board having to do with the approval and establishment of compensation insurance rates which may be charged in the State of Minnesota, long enough to convince me that I do not know very much about them. There are a few things, however, which might possibly explain some of these things which on the surface seem to be absolutely unexplainable. For instance, you might consider first what is the maximum rate of compensation in the State of Pennsylvania.

Secretary STEWART. \$15.

Mr. DUXBURY. What is it in New York?

Secretary STEWART. \$25.

Mr. DUXBURY. What is the relative difference between those two things? Is it much different from the relative difference between the rates?

Then, also, it depends upon the kind of things that go into the classification. If you limit the classification to the very limited hazard of a particular thing, experience is what you have to use, and that is coming to indicate a higher rate, but if you make a different definition of the classification, by which you put in a little sweetening, you get a sweetened experience which will indicate a lower rate.

Anyone who knows anything about this subject might be able to tell a lot of other things which might possibly explain it. I understand there is governmental regulation of insurance rates in the State of New York, and I am inclined to believe that the companies could not put over any hocus-pocus on those people and make them approve a rate not justified by the experience.

Secretary STEWART. These rates include the trucking and handling of material. I insist it is Code No. 5040 of the National Council. Your wage rate, Mr. Duxbury, for structural-steel workers is 71.4 per cent of the New York rate; in other words, the structural-steel workers in Minneapolis get \$55 a week and your rate there is \$22.26, which is almost as high as the New York rate—94.9 per cent of the New York rate.

Mr. DUXBURY. And our maximum is \$20 and theirs is \$25.

Secretary STEWART. Yes.

Mr. DUXBURY. When compared with the New York law, our law will fall down a long ways in its benefits.

Secretary STEWART. Yes.

Mr. DUXBURY. And you simply can not pay the increased benefits unless you correspondingly increase the rates.

Secretary STEWART. But your rate is almost as high as theirs. You are paying over \$3 a day premium rate to-day for structural-steel work in Minneapolis; almost as much as they are paying in New

York, but with a compensation law that does not begin to compare with the New York law.

Mr. DUXBURY. I presume probably you know that it would measure up to 90 per cent of the benefits of the New York law. There should be room for improvement there, other things being equal, but I can not remember all those eight or nine hundred rates and of what they are composed. It is possible we have some sweetening in our experience and maybe New York has some in its. It may be that the methods by which it determines those things differ enough to account for the apparent discrepancies.

Mr. McSHANE. The matter of rates is a very perplexing problem. The Utah board finds itself charged with the same responsibilities with which the Minnesota board is charged. While not men of technical experience, we are required to make rates from an actuary's standpoint. We have, as I think the Minnesota board has, secured the services of the National Council on Compensation Insurance.

We keep our accident costs very carefully, but because we are a small State industrially there are very few classifications that are self-rating and very few classifications where the experience is sufficient so that we can with any certainty predicate a rate from our own experience; therefore, the National Council, at our request, makes a national survey of the respective classifications, and having secured that national experience, finds what it costs, on the basis of the national experience, to carry a particular class—for instance, let us say steel workers; then it takes that and by a factor projects it to the New York act, which Mr. Stewart says is 100 per cent, and in my judgment it is pretty near 100.

When it has done that, it takes our laws and finds the ratio of our law to the New York law, which on the basis of the New York experience—that is, taking New York as 100—is 75. That is for all classes of accidents. Just to take the maximum weekly benefit doesn't mean anything. You have to have the benefit for death, and permanent total, permanent partial, and temporary disability, and medical benefits and the other factors that go into it. Taking the total, the entire thing, we pay but 75 where New York pays 100. We pay almost as much in medical aid as New York, but not nearly as much in some of the other factors entering into the total. In our State the rate is \$15 and some cents.

Secretary STEWART. \$15.

Mr. McSHANE. For structural-iron workers?

Secretary STEWART. Sixty-four per cent of the New York rate.

Mr. McSHANE. That is the recommendation of the National Council, because our experience is not sufficient to justify us in predicating a rate other than that adjusted by the National Council; so our rate is 64 per cent of the New York rate and our benefits are 75 per cent of the New York benefits. I hope that the time will come when every State claiming membership in this association will be able to give us the cost of their accidents, that they will not rely on the insurance carriers to get those costs, but, having statistical departments in their own offices and using case records, will have the actual cost. I believe that then some of the difficulties now being experienced in rate making will be clarified.

Mr. PATTON (New York). I do not want unduly to prolong the meeting, but for a year I have been wrestling with a subcommittee of this body on a classification of industries, and I am thoroughly convinced in my mind, as a result of that consideration, that the whole problem of classification of industries still remains in an extremely chaotic state; that none of us know very much about it; and that no State, not excepting New York, is classifying its industries on such a basis as to answer the questions which may fairly be asked.

For example, take the Du Pont Co. One of its products is gunpowder, a generic name for explosives. It is used in war time to blow legs off and to fracture skulls. Many of you drove to this meeting in an automobile, the top of which was covered and painted with a product made by the Du Pont Co.—Duco. From the standpoint of the classification of industry you have to decide whether you will classify the products of the Du Pont Co. as one thing or the other.

Take the International Paper Co. I presume the bulk of its income is derived from the sale of electric power. The bulk of its employee hazards arises from the fact that it is engaged in the manufacture of paper. You have immediately to decide whether you will classify its accidents as occurring in paper manufacturing or in the manufacture and sale of electric power.

In general, most of our State classifications of industries seem to run along on the basis of a classification according to raw materials. There was a time when that was fairly good. It is still true that you can take a large number of accidents, a hundred or a thousand, as they come in and classify them on the basis of the nature of raw materials and get some results, but you are going to be very, very far from accuracy if you do that. You may use raw materials as the basis, or product as the basis, or process as the basis. Or you may take a specific thing like corn and classify the manufacturers who use corn—the basis of raw material. Then take the manufacturer of cornstarch—the purpose to which the material is put. It is a foodstuff, and you may have justifiably another classification on the basis of process; for example, chemical processes; and you can further subdivide that as to, we will say, tanning.

You may say this is a plea of confession and avoidance. The report of the committee was to have been given yesterday and now it has been held over another day, but it is my opinion that you will not get a classification of industries by any committee appointed from this organization. Those of us who have a full-time job, and are supposed to work, have not the time and energy and, possibly, the confidence necessary to pursue this thing to the end.

I have on file now the industry classifications used in every State in the United States and a large number from foreign countries, and there is not one person in this room—I do not care what State or country he may come from—who can in the light of those justify every classification used in his own State, because I can show him different classifications for the same thing used in other States or other Provinces or countries which, if he is fair-minded, he will have to admit are better. I do believe the lack of proper industry classification is part of the problem at which Mr. Stewart is getting. It is one of the chief reasons why, as Mr. McShane wants to know, we can not in each individual State state precisely what our accidents

cost. Furthermore, the chief point I want to make is that it is such a big job that a mere revision of Bulletin 276 will not do the job.

Take, for example, a company which at first operates steam railroads and then both steam railroads and trolley lines, and then establishes bus lines, and afterwards begins the sale of electric light and takes over the operation of water works. Obviously you can not classify the accidents of that one concern under one heading. Furthermore, the growth of mergers in business, the tremendous growth of chemical processes in industry, the whole swirling, surging tide of modern industry, have become so complex that no single, simple industrial classification will do the trick. My point is that this organization would do well to have a permanent paid individual or staff, to work on the problem.

Secretary STEWART. Doctor Patton, structural-steel workers are classified the same way in every State in the Union. That is Code No. 5040. It gets us nowhere to talk about mergers in chemistry. I am talking about structural-steel workers. Three-fourths of these rates are made by the bureau Mr. McShane was talking about, which gives him a \$15 rate and gives you a \$23.45 rate, while in Philadelphia a \$6.50 rate is worked out by the State of Pennsylvania.

Mr. PATTON. As I said at the beginning, I can not answer your question, but Mr. Kelly pointed out, and it is true, that it does make a great difference in calculating the structural-steel rate whether you include the delivering of the steel. It clearly costs less to deliver a head of cabbage in the Mississippi Valley than to deliver it in New York City. I have nothing to do with the National Council on Compensation Insurance, and I do not pretend to justify what it does or to go as far as your possible imputation that they charge all the traffic will bear. I do not say they do or they do not. My only contribution to the problem was meant to be the suggestion that the classification of industry is a question, the complexity of which requires a much deeper, fuller consideration than this body has ever given to it or ever will have given to it on the basis of purely voluntary committee appointments.

Mr. MAGNUSON (Washington, D. C.). I think Mr. Stewart has done a splendid thing in calling attention to this discrepancy. Compensation insurance is a private business in the United States and under a private-business system you have to pay what the traffic will bear, and the company has to charge what the traffic will bear or it will go out of business. That is perfectly obvious, it seems to me. There are certain reasons for the different States having varied rates. In the State of New York structural-steel operations bear a certain relation to the total industry, to the productive effort of the State, and that has to bear the cost of compensation; by guess, or calculation, or consultation, that cost is based upon the productive effort of the State of New York in varying proportions according to what the different industries should bear.

Mr. Stewart has picked upon a distinctly good industry to show the difference in competitive rates in the different States, because structural-steel construction is done exactly at the point needed and is not an interstate commercial competitive thing; therefore, it will

bear a greater proportion to an industry in one State than in another, and the rate will be fixed accordingly.

The double reason, then, of jurisdictional lines—the States controlling compensation—and the fixed character of steel construction which prevents it from being an interstate competitive proposition, accounts from an economic point of view for the differences in State rates. While I do not know why the situation is as Mr. Stewart states, it seems to me that that is a kind of general economic explanation for the differences.

I think Mr. Stewart will find that the difference in rates will be less in industries like the textile industries where the competition is interstate, as it is nothing more nor less than the price of a commodity which under a competitive system is found to differ in the various places according to the demand of the market and the price the market will pay.

Mr. McCOLL (Minnesota). I know nothing about rate-making procedure, but from the figures quoted by Mr. Stewart, as I figure it out, in New York with a benefit of \$25 a week the insurance carrier collects \$21.60 a week for each steel worker. In Minnesota employers would pay about \$12 a week for a steel worker who, if injured, would get a \$20 benefit. It appears to me, figuring it that way, that something must be wrong if the insurance carrier collects \$12 for \$20 a week in Minnesota and \$21.60 for \$25 in New York.

Secretary STEWART. Minnesota has a higher rate than that. The wages in Minneapolis are \$55 a week, but your premium rate is \$22.26 per hundred.

Mr. McCOLL. The man can earn only \$55, so the carrier gets about \$12 per week.

Secretary STEWART. That is right.

Mr. McCOLL. And in New York State the carrier gets \$21.60 per week premium. The man earns \$80 per week and \$3.60 is the premium rate per day—I am figuring six days a week.

Secretary STEWART. Five days a week.

Mr. McCOLL. I am figuring six days in both instances. I realize that in New York State the benefits are better in many ways for the working man; the law is more liberal.

Secretary STEWART. Your Minnesota benefits, averaged up, are 90½ per cent of the New York benefits.

Mr. WILCOX (Wisconsin). I hate to discuss any subject without having the facts in hand. Had I known this matter was up for discussion, I would know why the rate in Wisconsin is what it is. There are two schools of thought with regard to this rate making. One of them is that of reducing the number of classifications to the very lowest limit, and if I am any judge of what is going on, I think the Pennsylvania plan is to get the number of classifications down to the lowest possible. That was Downey's theory, developed many years ago. Other States are having many classifications, dividing them up and trying to get the experience into those particular classifications.

I remember very well that Mr. Downey's reason for the reduction of the number of classifications was to do away with this attitude of mind of insurance companies, or this permission of conduct on the

part of employers, to allocate to the low-premium classification the things which ought to go into the high-premium classification. Pennsylvania has, by the reduction of the number of classifications, included the experience which develops a rate which it may call for structural-iron workers, but it includes a lot of pay roll that is in the less hazardous type of occupation.

Mr. Kelly shakes his head, but that has to be in there or you can not get the rate you are getting, because the benefits in the State of Pennsylvania are such that the rates can not come down to one-sixth, or one-fifth, or whatever it may be, of New York, unless something of that kind is happening. I am convinced that you will find that New York has a very large number of classifications—I do not know whether Doctor Patton agrees with me or not—and that it is holding within that structural-steel work classification only those men who work up high, and not the trucker down below and the man handling the materials, and a thousand and one other occupations that are less hazardous.

So it means that you have a high rate in New York for structural-steel workers and a low rate in something which you read as the same classification in some other State. It ought to be twice as much in New York as it is in Pennsylvania, because, after all, the structural-steel workers' injuries there will fall into the serious injuries classification, and the benefits for serious injuries in Pennsylvania will be only approximately half what they are in New York, so you will have that to contend with.

One of the things that happens when you try to divide up the classifications in many States is this permission to employers to allocate their pay roll to the lower classifications, instead of putting it where it belongs; but when the industrial commission in your various States assigns the particular injury that an employee has suffered, it will put it in the right classification, so the charge is there under steel construction work, and the pay roll will be in some other classification. Just as much as you permit that to be done, just so does the rate go skyward.

Secretary STEWART. New York has the same bureau of classification you have. It is done by the same people.

Mr. WILCOX. I will say this, Mr. Stewart: I resent this association going on record as assuming that the insurance companies of this country are putting it over on the States. I am serving in a capacity which makes it necessary for me to know something about how these rates are made. I hold no brief for insurance companies, but I know that, in so far as we can in our State, we are making our rates on our own experience and not on Pennsylvania's experience or New York's experience. I know that we are putting into the proper classifications the losses which are occurring in our State, but we have many difficulties, and the worst of all is this very thing I have mentioned, that of the auditing of the pay roll in a classification where it does not belong, and that is hard to handle.

Secretary STEWART. There are five rates, ranging from \$14 to \$18, the lowest being for the mutual companies and the highest for the stock companies.

Mr. WILCOX. The mutual rate is 10 per cent less than the stock rate.

Secretary STEWART. It is more than that.

Mr. WILCOX. I am talking about the Employers' Mutual, which writes half of our business or thereabouts, whereas three other mutuals are writing stock rates. I will guarantee to furnish you with information as to how the rate was made, the number of serious and nonserious injuries, the cost of each, the cost of temporary injuries, and the cost of medical aid for the structural-steel job, and if we have had enough pay roll in Wisconsin on which to predicate a stable rate that will be the rate we are charging in our State, and we will be charging it because that was the experience in the industry.

We have a rate maker here, Mr. Evans, of Ohio, and if this association is going to leave the impression in the record and otherwise that all of our States are being done—and I don't like this statement of Mr. Magnusson that these rates are being fixed according to what the traffic will bear—

Mr. MAGNUSSON (interrupting). On a competitive basis, I said.

Mr. WILCOX. Oh, well, if we fix the rates on their experience, then it is competitive. They are competitive in their overhead, but not otherwise.

Mr. MAGNUSSON. On a private competitive basis.

Mr. WILCOX. If we have to approve their rates, they are not in that field.

Mr. MAGNUSSON. The Interstate Commerce Commission has stated that railroad business is competitive business.

Mr. WILCOX. That may be competitive in one sense of the word.

Mr. MAGNUSSON. Ohio states that it is.

Mr. WILCOX. So far as the rates that are charged for structural-steel workers are concerned, they are not competitive in Wisconsin.

Mr. MAGNUSSON. I neither condemned nor praised them.

Mr. WILCOX. A rate is a rate.

Mr. MAGNUSSON. I see that I was misunderstood.

Chairman LEONARD. In view of the fact that Mr. Patton spent a year on the rates, structural-iron rates especially, I do not think we can settle it during the rest of the afternoon.

Mr. WILCOX. May I ask one question of Mr. Patton? This industry classification you are working on is a classification of the injury rather than an insurance classification, and that might be a very different thing. Am I right about that?

Mr. PATTON. Primarily I presume this association is interested in an injury classification for the prevention of accidents.

Mr. WILCOX. That might be different.

Mr. PATTON. I admit that it would be a good thing if the same classification could be used for all purposes.

Secretary STEWART. Bulletin No. 276 does not contemplate premium rates at all.

Mr. WILCOX. Mr. Patton, let me remind this group that punch presses are important as a classification for accident-prevention pur-

poses. I start with that statement. As punch presses may be in a hundred and one different kinds of institutions, you might have a punch-press classification, but from the standpoint of insurance rate making we will never make a rate on punch-press accidents. We will make rates on the various types of industries as we know them, as a patternmaking shop, or Simmons Co., or whatever it may be.

Mr. PATTON. Mr. Wilcox, here is a further objection to what you have just said, or, rather, more light on it. Take the different industries, for example; take the paper-box industry. There are countless instances of individual concerns which would never be thought of as paper-box manufacturers, yet which make their own paper boxes.

One of the problems in classification by industry is this: If you take the paper-box industry as an industry, then when you take the other concerns which make paper boxes incidentally and put them in the paper-box industry as a whole, or include them with this specific plant, whichever you do, you have confusion.

Mr. WILCOX. You spoke of the E. I. du Pont de Nemours Co. as the manufacturer of gunpowder and also as the manufacturer of Duco and the finish we use on the tops of our cars. They are two different industries, and there are two classifications for the rating of both of those, and it makes no difference whether they are done by one company or by two companies.

Chairman LEONARD. This has been a very profitable discussion. The Ohio rates have been made \$10 and I will have a conference with Mr. Evans to find out all about it.

The last paper is by Senator Duxbury, member of the Industrial Commission of Minnesota, on the Purpose, Nature, and Character of Compensation Laws.

Purpose, Nature, and Character of Compensation Laws

By F. A. DUXBURY, *member Industrial Commission of Minnesota*

It has been my privilege to attend 10 consecutive conventions of this association. It is quite impossible for me to express what I feel I owe to these conventions. While I am conscious that I have not been able properly to understand or retain even a substantial portion of the learning and wisdom of those who have taken part in the programs and debates, yet I feel that what little I have been able to comprehend has been fully supplemented by the inspiration incident to contact with men and women of the character of those who have attended these meetings and taken part in the proceedings.

Conscious as I am of my own limitations, it is with some diffidence that I undertake to discuss what seems to me so important a subject as that indicated by the title of this paper. However, during the course of these conventions I have formed some rather immature, indefinite, and possibly unsound conclusions with reference to what I believe to be the purpose, character, and nature of compensation laws generally. It seems to me that if the fundamental purpose and object of such laws were properly understood, it would be helpful in the interpretation and application of the laws as well as assist in the improvement thereof by amendment.

It is not my purpose to reflect on any existing compensation law. I have heard that some Irishman, I think it was, is reported to have said that "Whisky is all good, but of course some whisky is better than other whisky." Without approving his conclusions on that subject I feel like applying the suggestion to compensation laws. I believe that compensation laws are all good, but some are better than others. None of them, however, are perfect, and all of them need revision and amendment so as better to accomplish the fundamental purpose and objects of this class of laws. In order to do this successfully, we need to realize and fully appreciate what is the fundamental purpose and object of such laws in order not further to impair them by amendment or judicial construction.

I realize that there are many people, some of whom may be listening to me now, who will take issue with me when I state that in my judgment common-law theories of indemnity and damage have no place in determining what should be the provisions of compensation laws. I have no doubt that some will not agree with me in concluding that there are many provisions of existing compensation laws that are based on or controlled by common-law theories or existing statutory rules to the serious impairment of what ought to be the object of such laws. I also think that judicial construction and application of compensation laws have often perverted the fundamental purposes and objects of such laws, because not infrequently judges who are learned in the theories of the so-called common law have failed to comprehend the radical change in the character and purpose of compensation laws. I am also inclined to the opinion that there are many engaged in the administration of these laws and whose ability, learning, and experience in that field make them conspicuous in our deliberations, who have been, unconsciously perhaps, led into an attitude on some questions that is fundamentally in conflict with the spirit and purpose of compensation laws.

In reviewing the proceedings of some previous conventions in relation to certain subjects where it seems to me the fundamental objects and purposes of the law were involved, I have been impressed with the somewhat violent difference of opinion among those who have discussed the subject, which difference of opinion seems to me to have been founded upon different conceptions of the purposes and objects of compensation laws. I am therefore approaching this subject with apprehension that there are likely to be many here who will take violent issue with some of my conclusions, and especially with particular applications that I may make. I shall be glad if they do so in discussing this paper. I like people who do not agree with me and who have the frankness to say so, giving their reasons and the arguments for their contentions. I learn from such people, and it is by such means that the truth is developed.

I do not wish it to be understood that I am one of those who seem to think that the rules and theories of the so-called common law are in conflict with reason or justice or that judges and courts that have largely developed and announced these rules and theories were either vicious or ignorant. The common law of the relation of master and servant, as it grew up and developed in England and in the American States, was, in my judgment, founded upon the essence of wisdom and justice as applied to the conditions which existed at the time. Indeed it is even now recognized in probably every existing

compensation law that the common law is the proper rule of liability in employment conditions similar to those which existed when the common law was developed. This is done by excluding from the application of the compensation law certain classes of employment, such as domestic service, farm laborers, and other classes, as well as by excluding small employers who employ three or possibly a smaller number in some States to 10 or more in other States. The only possible reason for such exclusion is because in the wisdom of the legislatures the rules of the common law, as these may be modified by statutory provisions, apply to such employment conditions better than any other system of laws. It therefore ill becomes those who are engaged in the administration of compensation laws to reflect upon the wisdom or justice of a system of law that has been established through the experience and wisdom of ages to govern the rights of parties under proper conditions. There may be room for difference of opinion in relation to the wisdom of certain provisions of limitation of the application of the compensation law, such as the number of employees, ranging from a small to a much larger number, but that does not imply a condemnation of the system where it is properly applicable.

It is probably not important nor even necessary to recite the reasons why the common-law system of liability became unsuited to certain employment conditions. These reasons have been given so frequently and so well that they do not require extensive reiteration. It is sufficient to say that there existed a situation where Lowell's maxim was applicable, that "new occasions teach new duties; time makes ancient good uncouth."

In order, however, to assist in determining what is the fundamental purpose and object of compensation laws, it may be well to consider briefly some of the reasons for the enactment of such laws.

Among the things that seemed to require a change in the system of liability for employment disabilities was the radical change in a large number of employment conditions, such as increase in the number of employees of a single employer in which the personal contact and employment opportunity were radically modified; also the increased use of machinery and organized factory or other employment conditions causing increased hazards from such changed conditions, including the increase in the number and character of fellow servants, not possible for the employee to appreciate or control, and rendering the assumption of risk and fellow-servant rules inequitable and fairly intolerable in such employment conditions. This, together with the vagaries of juries in determining the amount of indemnity, resulting in excessive verdicts in some cases and radically inadequate verdicts in others, together with the pernicious activities of so-called ambulance-chasing lawyers, and the equally or even more vicious activities and unscrupulous methods of special adjustment agents for large employers, who did not have to chase the ambulance, but usually had a seat thereon as well as the password to the hospital, and who took advantage of the laudable desire of the victim not to offend his employer, and the high regard he had of the value of his job which induced the victim to agree to an unjust settlement, were strong considerations in bringing about a change in the provisions of law and the methods of administration.

Weighty as the foregoing matters were in requiring a change in the rules of liability, it is apparent that the fact that indemnity or damages, as determined by settlement or court adjudication, was so frequently not wisely applied to promote the economic welfare or readjustment of the claimant and his dependents, but was in many instances almost worse than wasted, thus increasing the burdens of society to care for the human wreckage incident to industrial employment, had a weighty influence in bringing about a change in the rules of liability.

It became increasingly apparent that economic readjustment or rehabilitation of the victims of employment injuries and their dependents was more important, not only to such victims and their dependents but to society, than was the payment of money indemnity or damage in cases where the fault of the employer had caused the damage, with no remedy whatever available to the victim or to society when the fault was his own or that of a fellow servant, or where the condition resulted without human fault. The natural and obvious remedy was to substitute the right to economic readjustment in every case of employment disability or death for the existing right to an intangible and uncertain amount of money indemnity in a portion of the cases, with no remedy whatever in a large number, if not most, of them.

It is not necessary to discuss whether the substituted remedy is better than the old. The fact that this remedy has been so generally adopted in the leading countries of the world seems sufficient answer, if any be required. I am concerned only with the nature and object of the changed system and not with the relative merits of the two systems.

The character of the economic readjustment that should be the object of compensation laws is, it seems to me, such readjustment as will enable the beneficiary to become an independent self-supporting member of society in any capacity he may be able to qualify, without regard to whether it be the same as that in which he was disabled or some other capacity, and that any money benefits paid to him after such result is accomplished are in the nature of indemnity or damage and not strictly in accord with what should be the object or purpose of the compensation law.

While in many cases of temporary disability the employee will be returned to the same job at the same remuneration, and in some cases of even more severe injuries to a different occupation at even a better income, yet it would be absurd and contrary to what should be the object of such laws to expect that full and absolute economic readjustment of the same standard as that existing before the disability should result from the provisions of the compensation law. That would involve the principles of indemnity or damage to the individual for results which may have been produced by his own fault or without human fault. To do this would frequently violate every principle on which the right to indemnity or damage should be based and is outside of and in conflict with what I think should be the purpose and object of this class of laws.

Among the essential provisions of compensation laws to accomplish economic readjustment, probably the most important is that which requires the employer to provide and furnish everything that medical

science and skill can accomplish to rehabilitate physically the beneficiary. Physical rehabilitation is a vital necessity of economic readjustment. The expense involved should not be reduced to a schedule or other form of limitation of the amount to be expended. The only limitation should be that involved in medical science and professional skill and experience. I am not convinced, however, that so-called unlimited medical requirements ought to include hospitalization and personal attention sometimes incident to the existence of one for whom there is no hope of relief from medical science and where there is no chance of any degree of recovery necessary to economic readjustment.

Another necessary thing to accomplish economic readjustment is the payment of money to provide for the necessities of existence during the period of economic reconstruction and adjustment, commonly designated as "compensation." The problem of what ought to be the specific provision relating to this feature of such laws is one that has not been very satisfactorily determined. It can not be properly denied that what might be claimed to be the best existing provisions with reference to this feature are quite crude and unscientific. The problem is one that is too complicated to warrant me in attempting any conclusions. However, I am convinced that any plan of determining the rate of periodic payment, or the number of such payments, or the total amount to be paid, that assumes to determine as the basis of such plan the economic loss that the beneficiary has suffered by reason of the accidental injury is unsound and unscientific and not in accord with what should be the purpose and policy of compensation laws. The most liberal schedule found in any compensation law would generally be wholly inadequate to indemnify for the pecuniary loss resulting from the injury, while in some particular cases a law with the lowest monetary provision might exceed the pecuniary loss or damage resulting from the injury in a particular case.

It is probably true that, unscientific as these schedules are, they generally bear some reasonable relation to what ought to be the money payments necessary to accomplish the purpose of the law. It is nevertheless true that what may be called the best of them have been fixed and determined either upon a purely arbitrary basis or upon a theory that was not sound. These provisions are generally regarded with a certain degree of sanctity not deserved, seemingly resulting from the fact that it is assumed that somebody must have had some reason for their determination, and having been enacted into law they have the peculiar sanctity incident to legal enactments that is frequently wholly undeserved.

It was said by the late Carl Hookstadt, in discussing a report of a committee on "Permanent partial disability schedules," found in the report of the Baltimore convention, published in Bulletin No. 333 of the United States Bureau of Labor Statistics: "The first flat schedule to be enacted into law (New Jersey) was probably based upon a scale of values in use by personal-accident insurance companies and awards for damages in personal-injury suits. The New Jersey schedule seems to have served as a model for the other States." What possible relation the scale of values in use by personal-accident insurance companies or awards for damages in personal-injury suits

might have to the money payments necessary to accomplish economic readjustment in compensation cases is quite beyond my comprehension. Indeed, I have the temerity to assert that there was no necessary relation whatever between the two.

It is quite apparent that the amount of the separate payments, as well as the number and total amount necessary to accomplish economic rehabilitation, will vary in each particular case. It probably is impractical to attempt to determine that upon the requirements of each particular case, and it is no doubt a practical advantage for administrative purposes, and possibly for purposes incident to the vital objects of the law, to have provisions for definite determination of the amount of money payments. I am quite convinced that a provision for the full payment of the money benefits during the period of physical rehabilitation and for a reasonable time thereafter accomplishes the purposes of the law better than any life-pension system or other long-drawn-out method of money payments. It is undoubtedly true that in some instances these payments will be in excess of what is vitally necessary to accomplish the purposes of the law, while in other instances such limit of payments will be inadequate.

The peculiar character of the subject matter is well illustrated by the report of the committee on statistics on "Standard permanent disability schedule," published on page 72 of the bulletin above referred to, together with the debate thereon covering about 75 pages of that report. I might be pardoned for an apparent digression to state that this report was the result of lengthy deliberations of the standing committee on statistics and compensation insurance costs, and was not finally disposed of until the meeting in 1923 at St. Paul. At the Baltimore convention, after a lengthy debate in which there was a violent difference of opinion in relation to the principles that ought to be involved in the schedule or method of money payments in compensation laws, the matter was re-referred to the committee, but finally, after further deliberation, was approved at the St. Paul convention.

At the Baltimore convention a delegate from Massachusetts, in criticizing the report of the committee, stated: "It seems to me that the schedule is fundamentally unsound from beginning to end. * * * I may be wrong about it, but I do not think so. If we want a damage law, if we want to turn over to the compensation boards the assessment of damages for those people who are hurt in industry instead of giving it to juries, why not go at it like a jury would. * * * If this convention and the industrial accident boards of this country want to change this act into a damage act, if they want to pay a man because he has lost something, just as the jury gives it to him when he loses a leg on the railroad or elsewhere, well and good, but do not let us fool ourselves into thinking that we are dispensing just compensation."

Whether these criticisms were deserved or not, the fact remains that, so far as I am aware, no State, except possibly Wisconsin, has modified its schedule of money payments to conform with the principles involved in this report. At the time the report was adopted in St. Paul, having as president of this association had the privilege of meeting with the committee, I was not convinced that the committee had used a proper basis for their conclusions. I am now

fairly convinced that the criticisms of the Massachusetts member were quite justified and that it is fortunate that the conclusions of the committee have not to any great extent at least been embodied in compensation laws represented in this association.

I have referred to this report and the results that have followed it for the purpose of indicating what I feel has had a considerable part in defining my impression with reference to the subject matter of this paper. I think that the chief reason why the work of this committee has proved to be practically vain is because the committee proceeded upon wrong theories, with the result that their conclusions were not sound. I say this with hesitation because I recognize that the committee was composed of probably the best equipped and most outstanding members of this association, for all of whom I had and still have the most profound respect.

Another circumstance in the proceedings of this association which I think had an important influence in defining my conclusions with reference to the subject matter of this paper is what has been familiarly called the "Wenzel resolution." This resolution was introduced at the meeting at Salt Lake City in August, 1925, in connection with Mr. Wenzel's paper on "Preexisting diseases," reported in the proceedings of that meeting in Bulletin No. 406 of the United States Bureau of Labor Statistics, commencing at page 99. Among other matters it is recited "That in case of aggravation of any disease existing prior to such injury the compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributable to the injury," and it was "*Resolved*, That the various industrial accident boards and commissions of the Provinces of Canada and the States of the United States be, and they hereby are, urged to accept, adopt, and adapt the foregoing basis in the handling of preexisting disease cases."

This resolution was referred to the committee on resolutions, which committee reported that the resolution and paper offered by Mr. Wenzel be referred to a special committee of five members to be appointed by the president, which committee should report at the next convention of the association to be held at Hartford, Conn. In Mr. Wenzel's paper is a review of a large number of cases decided by the courts of various States of the character referred to in his resolution. Without attempting to review these several cases, it is sufficient to state that they are of the type suggested in the preamble to the resolution; that is, cases where an accidental injury aggravated a preexisting chronic condition and resulted in an unusual length and degree of disability, a large portion of which was undoubtedly incident to preexisting conditions and not to the injury resulting from the accident, one of these cases being that of a fractured forearm which would ordinarily result in medical and compensation expense not exceeding \$300, but which did result in an expense of about \$3,600. After detailing the facts of the particular case, Mr. Wenzel suggested the question, "Is it fair to charge all of this to the industry and to the individual employer concerned?"

The committee appointed to consider this resolution and Mr. Wenzel's paper, consisting of Mr. Kingston of Ontario, chairman, Mr. Armstrong of Nova Scotia, Mr. Wilcox of Wisconsin, Doctor Donohue of Connecticut, and the writer of this paper, were unable

to meet before the time of the Hartford convention. Mr. Kingston, being unable to attend that convention, submitted a paper on the subject which will be found commencing at page 52 of the report of the proceedings of that meeting, in Bulletin No. 432 of the United States Bureau of Labor Statistics, in which he reviewed a large number of cases of the character referred to in Mr. Wenzel's resolution, including a provision of the California law to the effect that—

The term "injury" as used in this act shall include any injury or disease arising out of the employment. In case of aggravation of any disease existing prior to such injury, the compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributable to the injury.

He also referred to the fact that an amendment to the Ontario law practically to the same effect was introduced at the last session, but because of opposition the bill was withdrawn. He stated further that the Province of New Brunswick has a provision in its compensation law as follows:

In any case of aggravation of a disease existing prior to such injury compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributed to the injury sustained.

Mr. Kingston closed his paper with the statement that "It is felt that there is much to be said in favor of the idea which Mr. Wenzel evidently had in mind in presenting his resolution at the Salt Lake City convention."

The committee at the Hartford convention disposed of this entire matter in the closing hours of the convention, recommending that the Wenzel resolution be not adopted. There was no debate on the subject, and the report of the committee was approved.

As chairman of the resolution committee at Salt Lake City, where the resolution and the paper were introduced, and as a member of the special committee, I was much interested in the subject matter of this resolution and the papers of Mr. Wenzel and Mr. Kingston. Like nearly every other member of this association, so far as they expressed themselves informally, I felt that the resolution did not harmonize with the objects and purpose of the compensation law. I was anxious that the matter be considered in debate so as to develop the reasons, if there were any, for my attitude in reference thereto. The interest that various members took in this resolution and the contact which I had with it have caused me to give it considerable thought, and I have become thoroughly satisfied that such a provision in compensation laws would be in direct conflict with the purpose and object of such laws.

Among the reasons for this conclusion, briefly stated, may be mentioned the fact that it is probably seldom that a normally physically perfect person suffers an accidental injury. A very large portion of them have some physical defect. Some have greater powers of recuperation than others. Some will carry on under serious disability while others differently constituted will yield to trifling inconveniences. The purpose of the compensation law is to restore each of these various persons to a degree of efficiency sufficient to enable them to become independent and self-sustaining members of society. Society very justly requires that employers bear the rea-

sonable expense to accomplish this result. Society is just as interested in the economic rehabilitation of a man who may have some quite serious chronic disabilities which are aggravated, or which otherwise enter into a disability resulting from work injuries, as in the economic readjustment of a perfectly sound individual. More than that, the vital principle of the resolution and the provisions of the compensation law referred to are really based upon the idea of proportionate damage or indemnity resulting from the accident and lose sight entirely of the real object and purpose of compensation laws.

It is a well understood and necessary principle that the employer takes the man with his physical limitations or disabilities, and that he assumes the chance that a somewhat minor injury may result in more than a normal period or severity of disability in case of a work accident. Any other rules would produce a state of uncertainty as to the extent of liability and would defeat in many instances the real purpose of compensation laws—i. e., the economic rehabilitation of the injured employee. It is no answer to say that such aggravated disabilities and increased expenses incident thereto are an unjust burden on industry. It is rather a just and proper burden and one which every principle and theory of the compensation law fully warrants.

It would be quite impossible and outside of the reasonable limits of this paper to attempt to enumerate existing provisions of compensation laws that I think violate the fundamental objects and purposes of such laws. It is even more impossible to review decisions of cases that seem to be based on a failure to appreciate these objects and purposes, possibly caused in some degree at least by the fact that members of the bench are unconsciously influenced by their learning and respect for the principles and theory of the entirely different system of laws formerly governing the rights and liabilities for employment injuries. It is also probably true that legislatures in framing compensation laws have been unconsciously influenced by the same things that have influenced courts in construing and applying these laws.

At the risk, however, of unduly prolonging this paper, I may be pardoned for stating that among several such instances in the Minnesota law is the provision to the effect that the surviving wife and children under 16 years of age shall be conclusively presumed to be wholly dependent and entitled to compensation (which ought to be for economic readjustment, of course) and to the limit hereinafter stated. While in the vast majority of cases this presumption is probably true in fact, yet there are cases where such wife and children are possessed of ample independent means, and payment of compensation has no basis whatever except that of damage or indemnity for the death of the husband. So also the Minnesota law provides a limitation for dependency compensation of \$7,500, more liberal in a sense than is usual in such laws.

I am unable to conceive what reasons or theories led to the adoption of this particular amount, or in fact of any definite amount as a limitation of money payments in dependency cases. It seems, however, quite probable that the fact that this is the limit of damages fixed by Minnesota statutes for death by wrongful act suggested

this as the proper limit for compensation payments, the purpose of which should be the economic readjustment of wife and children under 16 years of age, or other dependents. If this be the reason, I am unable to see the analogy except a mistaken conception that compensation liability is in the nature of indemnity or damage which should have a definite and fixed limit as in death by wrongful act.

Admitting that some limitation of money payments is necessary in dependency cases, it seems to me that it should be a time limit, such as 16 years of age for children, and not to exceed a definite period for other classes of dependents. The absurdity of a limit of amount is well illustrated by the results in particular cases.

For instance, a case is not unusual, in fact it is quite frequent, where the only dependent is the wife, who may be in the prime of life and even actually employed at remunerative wages at the time of the death of her husband, so that there is in fact no real necessity for economic readjustment. Being without "chick or child" and amply able to provide for her own necessities, yet she can claim compensation to the limit of \$7,500 if she remains single, and if she remarries and in legal theory is no longer a dependent she is still entitled to two years' additional compensation without interest deduction. The only possible basis for such results is that of damage or indemnity and not economic rehabilitation.

Contrast this with the case of a woman of similar age who is the mother of several children of tender age. Even though she be physically able to earn as soon as she is able to find employment, she already has a job that makes it practically impossible for her to become even self-sustaining, without regard to providing for the necessities of her helpless children. Economic adjustment of her and her children requires a longer period of time and more money payments than the case of the woman without any employment handicaps. Yet under the limits of amount to be paid she and her children, while they get a larger amount of weekly compensation, are required to accomplish economic readjustment in a shorter period of time than is provided for the childless widow, in spite of the handicaps to economic readjustment which exist in such cases.

This provision in the Minnesota law is no worse than that in many other States, and in fact is better than in many. My point is that it is wrong in principle and needs revision to accomplish the real purpose and object of such law.

As an instance of what seems to me a failure of the court to comprehend the object and purpose of the compensation law, the number of which instances are numerous, is a case in which the facts were substantially these:

The father of a family consisting of wife and five children had been employed for many years at a salary that had enabled him to support himself and family, and by frugality and thrift he had become the owner of his home. He had kept his children in school, providing for their necessities of existence and schooling out of such earnings. The oldest boy appears to have been a very diligent and credible lad and at times during the past few years had earned small sums of money during school vacation periods. These sums were used by the father for the boy's and the family's necessities, but it was admitted that the expense incident to the boy's maintenance and

schooling far exceeded these earnings and the value of services performed in the nature of home duties. The result was that on the whole the son was a dependent of the father, and not the father a dependent of the son. Having finished the extent of schooling that it seemed to have been the purpose to give the boy, he was employed at a wage of \$12 a week. He worked for a few weeks, during which time he had been paid only a portion of his wages, which were used for his own purpose, when he was killed by an accident arising out of and in the course of his employment, and the father and mother claimed compensation as his dependents. Neither the father nor the mother had received any portion of his wages prior to his death except as they were relieved from furnishing him certain necessities that he bought for himself out of the portion of wages that had been paid.

The Minnesota compensation law provides that a father or mother who regularly derives part of his or her support from the wages of the deceased workman at the time of his death and for a reasonable period of time immediately prior thereto shall be considered as partial dependents. In this case, neither the father nor the mother had received any part of the wages of the deceased, either at the time of his death or at all.

After the boy's death, the father collected the amount of money due for his wages, amounting to \$90.50, which of course he had a right to. The boy was a minor and his wages belonged to the father. Such payment after the death was not at the time of the death nor for a reasonable time prior thereto. The court, in determining that the parents were entitled to compensation, states that "It is conceded that the parents suffered a substantial financial loss by the death of this minor son." This seems to indicate that the court had in mind the damage for loss of services which were to be rendered by this boy before he reached his majority, and not the question of whether or not there was an impairment of the economic status of the family as it had existed and did exist at the time of the death of this son. So far as the economic condition of this family was concerned, which is the thing that compensation should consider, it was better than it had been up to that time, because the son had become practically self-supporting, and the unimpaired income of the family was available for the benefit of the remaining members. There was no economic readjustment indicated, and nothing was required for that purpose, so that the payment of dependency compensation was in lieu of damages for loss of services of a minor. The right to recover for loss of service would of course depend upon negligence of the employer, which, so far as the facts disclosed are concerned, did not exist. In other words, there would have been no remedy for damages under common law or statutory liability. Yet the court directed compensation in lieu of damages for which there was no liability under former rules of law.

The reason given indicates quite plainly that the court failed to appreciate that compensation in no case is in lieu of damage or indemnity, but is based upon entirely different purposes and objects which did not exist in this case and do not exist in very many cases where courts and commissions have granted compensation because of an apparent undisputed loss which would affect future economic

conditions. Compensation should be based upon economic conditions existing at the time of the death or injury and not upon indemnity for probable or even positive loss of income in the future.

A clear conception, it seems to me, of the fundamental objects and purpose of the compensation law is also frequently useful in determining the rights of the parties in cases where there is a request for commutation of compensation due in the future. Everyone understands that the provision for periodic payments is a wise provision to promote economic readjustment, because it enables the claimant gradually to readjust the economic conditions of his existence and is more likely to be effective than is the payment of a considerable sum at one time. However, there are instances where all the circumstances of the case indicate with reasonable certainty that a considerable sum, or even all the compensation due, will be used in financing an existing business in which the applicant is engaged and is in every way likely to be successful. There are such cases where there is no room to doubt that the payment of a considerable sum, or even all the compensation remaining unpaid, will be more likely to promote the economic readjustment of the claimant than would periodic payments as provided in the law. I have no hesitancy in that class of cases in directing the payment of the same for a purpose of that character whenever I am satisfied that what I regard as the fundamental purpose and object of the law will be better accomplished in that way.

As heretofore indicated, it is quite outside the limits and purpose of this paper to make an extended recital of specific instances where the right conception of the objects and purposes of the law would indicate what determination should be made. My only regret is that this subject might not have been assigned to someone whose experience and ability would enable him to treat the subject much more skillfully and effectively than I have been able to do. I hope that what I have said, whether my conclusions be right or wrong, may result in the subject getting the consideration by others that I feel its importance deserves.

I trust also that no one will infer that I desire or hope to lessen the so-called burden on industry incident to compensation liability. On the contrary, I am firmly convinced that the reasonable purpose of the law can not be attained without increasing such so-called burden. I believe that existing compensation laws should be amended to raise both minimum and maximum payments, to provide unlimited medical expense, to extend the limit in the period of payment, especially in certain types of dependency cases, and in other particulars. The chance of accomplishing these objects would be materially increased if the laws were framed and construed by the courts in harmony with the real nature and purpose thereof. If we save that now required for purposes not logically within the province of compensation laws, we promote the probability of more perfectly accomplishing the real object and purpose of this system of laws.

DISCUSSION

Mr. WILLOUGHBY (Illinois). I have listened with interest to the paper by Commissioner Duxbury on the Purpose, Nature, and Character of Compensation Laws. During my years of practice as a

lawyer I had some contact with matters involving compensation law, but it was not until I became a member of the Illinois commission that I had any realization of the practical and technical problems that confront those who have to do with the administration of compensation laws. By administration I mean not only the doing of the routine things of office, but endeavoring to form some concept of the purpose of the law and to work for the attainment of that purpose.

I have not formed any opinion as to the merits or demerits of such propositions as the extending of the scope of compensation laws, the adoption of a variable rate of compensation, or the modification of present compensation laws so as more scientifically and equitably to meet the problems of employer and employee. These are matters for expert opinion, and expert opinion on any subject is the result of many years of training and experience. I shall, therefore, confine my remarks to the particular compensation act with which I have to do and with the working out of one of the purposes of the act, as I conceive that purpose. I will say, however, that I am a believer in compensation law. Whatever its faults and inadequacies may be, I think it is a great improvement over the old common-law system. There are many and varying theories as to the scope and purpose of compensation laws, but as a practical proposition I believe the compensation law is of incalculable benefit to the injured workman in that it furnishes him income when often he needs it most. Now, the particular point upon which I wish to touch is what the Illinois commission is doing to see that the workman secures the benefit of the law as it now stands on the statute books.

For one thing Director Barney Cohen, of the department of labor, and C. S. Piggott, chairman of the industrial commission, have recently established a new plan of cooperation between the industrial commission and the factory inspection division of the department of labor which is intended to increase the efficiency of operation of the industrial commission.

The deputy inspectors of the factory inspection division make regular inspections of practically every industrial establishment in the State, in order to insure proper compliance with the various factory laws coming under the jurisdiction of the department. The majority of these industrial establishments also come under the provisions of the workmen's compensation act.

Under the new cooperative plan the factory inspectors when making an inspection will present to a responsible official of the establishment being inspected a questionnaire to be filled out with the following information: Name and address of establishment, business engaged in, mechanical equipment used, and number of employees. The questionnaire also asks whether the establishment has secured workmen's compensation insurance, and if so, the name of the insurance company. If the establishment has not secured such insurance, the official is asked to state the reasons for not doing so. The questionnaire, when complete, is to be returned to the industrial commission. By this system the industrial commission will be able to check, at frequent intervals, the compliance of Illinois industrial establishments with the provisions of the compensation act. The questionnaire is designed mainly to show whether establishments

have provided workmen's compensation insurance or some other adequate and acceptable method of carrying their compensation risks. The commission will take prompt action, in case of establishments coming under the act which have not made adequate provision for such risks, to see that the law is fully complied with. Under this new plan the industrial commission hopes to deal more adequately with the problem of noninsurance by small employers coming under the act and with the problem of employers who, while attempting to make provision for compensation risks, have failed to comply fully with the provisions of the law. The commission believes that this plan will have great educative value, and that the supplying of full information on the scope and meaning of the act will go far to decrease these serious problems which confront the commission, and will make it unnecessary to resort to the penal provisions of the act. This plan is intended to secure for the workman full protection in his right to compensation and to protect him from being victimized by the insolvency of an employer who for one reason or another has failed to comply with the provisions of the act. Incidentally, I might mention at this point that the commission has from time to time published articles, written in plain, simple English, for the workman. These articles give a short, simple résumé of the act, with suggestions to the workman on how to secure all the benefits of the act. For instance, with regard to the subject which we are discussing, they suggest the advisability of learning if their employers have insurance coverage under the compensation act. I believe that all of these methods will be helpful in procuring compensation for injured workmen who are legally entitled to such compensation.

The commission has also gone into the question of securing the financial responsibility of the employer to pay compensation to his injured employees. To that end the commission has interpreted the act to mean that the employer must put up securities in escrow, provide proper and acceptable bond, or provide compensation insurance, all of which must be approved by the commission. I have with me a copy of the bond approved by the commission, which I shall not read into the record at this time, as it is rather lengthy, but which I shall be glad to discuss.

The commission hopes by the methods heretofore outlined to protect and safeguard the rights of the workingman to compensation in situations where he can not protect himself, and to see that he at least gets the benefit of the law as it now stands on the statute books.

Mr. **ALTMAYER** (Wisconsin). I was a member in 1920 of the committee which formulated the standard table for permanent disability, and we thought we were exactly in accord with your principle of economic rehabilitation when we developed that table, which provides that you shall pay a varying amount per week for the same number of weeks, the amount varying according to the extent of the permanent disability, rather than pay the same amount for a varying length of time, as is done by all other States with the exception of Wisconsin and California.

We felt that a man aged 30 years should receive the same amount per week as a man aged 50, but that he should receive it for a greater number of weeks because his working-life expectancy is greater.

In most States they pay no regard to age at all and they do not vary the amount of compensation per week according to the extent of the permanent disability of the man; in other words, if you have your right arm cut off you get the same amount per week as if you have your little finger cut off, but you get it for a greater number of weeks.

Our committee felt it was absolutely right and perfectly in accord with this principle of economic rehabilitation, because a man receives the full weekly benefit for a certain number of weeks and then you cut him off at the end of a few weeks—at the most, in a major permanent disability, in five or six years—and for the rest of his life he does not get a cent of compensation for the permanent disability which he carries throughout life.

We felt that this principle meant that you should supplement his income through life with this compensation, which is intended to replace to some extent the economic loss which he has sustained, rather than to drop that supplementary income at the end of a few years. Bear this in mind, when you pay the full weekly compensation, if the man does return to industry, you add that to his wages and perhaps that results in a higher total income for that man than he had before he was injured. He adjusts his living scale to this higher income, and at the end of five or six years, at the most, he has to go back to the lower income, and the social consequences are not at all what they should be. We felt that the social consequences would be better if the man's economic loss was compensated over the entire period it extended.

So, to that extent I would disagree with Senator Duxbury. I subscribe to his fundamental principle of economic rehabilitation, but I urge that our standard table for compensating permanent disability is in closer accord with that principle than with the principle of damages, and I say that the ordinary way of compensating for permanent partial disabilities is closer akin to the principle of damages than our proposed table is. I should hate to have the members throw overboard that work of 10 years ago. I should like to have them review it once in awhile and see if it doesn't look pretty good.

Mr. DUXBURY. I want to say, in response to that, that I tried to convey the impression that I consider myself neither competent nor able to define or express any opinion upon what the particular mode ought to be—just how the money payments should be made, whether they should be paid as I indicated, possibly during the period of physical rehabilitation and for a reasonable period afterwards, or by the method suggested by the gentleman from Wisconsin—but I have this objection to the provision which his State has—his very discussion of it, if you noticed, indicated that he was going to reimburse the man for what he had lost—his economic loss. I do not know just exactly how much money his commission would pay the young man 30 years of age who had lost an arm, for instance.

Mr. WILCOX. \$9.75 a week for 1,000 weeks.

Mr. DUXBURY. For the loss of an arm? That is quite a substantial payment. It is more than most States give.

Mr. HALFORD. We give 70 per cent of the compensation for total disability for as long as he lives.

Mr. DUXBURY. But how do you know what his loss is? I undertake to say that if any of you men were sitting to determine the economic loss of that particular man, age 30, with his capabilities, and you were trying to indemnify him for his economic loss, there would be human judgment on all the factors, which would include his age and many other elements which would have to be taken into consideration; but what I want to convey is this thought, that the idea of attempting to give him something bearing some relation to his economic loss is not the purpose of the money payments at all, and it ought not to be, because if he is to be indemnified for his economic loss, you would have to get some reasonable basis for doing that.

Society is not interested in making him as well as he was before, in restoring to him everything he has lost, by way of money damages. That would break down any system. Some of you who have trouble with advancing rates would fall over backwards to accomplish something approximating what you say is the basis of your payments, but really has no relation to that. If you think about it, you will realize that. The economic loss involved in the industrial accident is something stupendous compared with what is actually paid in compensation.

Mr. ALTMAYER. I want to make this clear, that this committee was not attempting to measure the full economic loss to this man except in so far as the economic loss meant that he was no longer a self-sustaining unit of society.

The surest way to accomplish the economic rehabilitation of the individual and to keep him a self-sustaining unit is to pay him for his economic loss over the period of time that economic loss will extend. To that extent you can call it damages if you will, but the idea was to consider this man as a unit of society, not as an individual sufficient to himself alone, and how else can you do it unless you compensate him for the economic loss over the period of time that it will extend.

Mr. DUXBURY. What do you do with a minor injury such as the loss of a finger and things of that kind?

Mr. ALTMAYER. Those can be compensated in a lump sum, because we know from experience that they will not make the man a charge upon society; they do not seriously interfere with his wage-earning capacity so that he is likely to become a public charge.

Mr. DUXBURY. Why give him anything except for temporary disability, then?

Mr. ALTMAYER. If you will refer to the committee report, you will see we did not give him anything for the minor disability. The only reason we do it in Wisconsin is to tide him over the temporary period of rehabilitation, and I agree with you, he needs it when he is getting readjusted to the minor handicap more than he will need it later on.

Mr. DUXBURY. But through it he is made a permanent partial disability case for individual finger injuries.

Mr. ALTMAYER. No, they have to become full-time finger injuries, and then it is only one or two per cent.

Mr. DUXBURY. How do you get at that one or two per cent? Where is the social wisdom which determines that conclusion?

Mr. ALTMAYER. When you get right back to it, we have to use a lot of judgment. We did not have the statistics available to determine what was the economic loss, and no one on earth can tell you to any degree of certainty what it is, but now you are getting back to the proposition of whether we should have schedules or compensate according to the necessary wage loss.

Mr. DUXBURY. I am passing that up to somebody who knows more than I do. I want to see if he can define the principles that ought to guide in that. I know I can not do it; it is beyond me.

Chairman LEONARD. Doesn't a great deal of this depend on the person himself, the individual?

Mr. ALTMAYER. Of course it does, and that is what I said. All of the schedules are more or less arbitrary and many times they will not measure the economic loss in individual cases, but for economy of administration we have adopted the principle of schedules. We have not done it, I believe—at least in this model table of ours—because we want to indemnify the individual for the arm he had taken off; we did it because we wanted to supplement his future income to the extent that he would not become a public charge. That is what I understand by economic rehabilitation, but we conceive of it as extending over the whole working life of the man rather than the temporary period following the accident.

Chairman LEONARD. You mean during the rehabilitation period?

Mr. ALTMAYER. We conceive of what Senator Duxbury calls economic rehabilitation as extending over the whole life of the man; we are not paying him as an individual for the loss, because of damages, but because we want to make his income sufficient so that he will still remain a functioning social unit.

Chairman LEONARD. Isn't it the big thing to get him back in industry and in an earning capacity?

Mr. ALTMAYER. That is another point in favor of the model table, because as soon as you pay the man full weekly compensation instead of a reduced amount depending on the type of disability, the longer you keep him from getting back into a wage-earning capacity. If you pay a man in New York \$25 a week for minor disability, the compensation extending over a short period of time, the tendency will be for that man to stay away from the job until his \$25 a week ceases, whereas under the model table he would get only a couple of dollars a week, maybe not enough to live on, but over a long period of time, and the tendency would be for him to hunt up a job to live.

Mr. DUXBURY. How will he exist during the period when he is positively not able to work?

Mr. ALTMAYER. Under our table he is paid for temporary disability at the full weekly compensation rate.

Chairman LEONARD. On a temporary total basis?

Mr. DUXBURY. On a weekly wage that is adequate? Why does he want to let go of it and go on the \$2 a week?

Mr. **ALTMAYER**. He must when the doctor says he is as physically fit as he ever will be and any disability he has then is permanent. Temporary disability then ceases and he has to go on the permanent disability rate. That is a matter of medical opinion.

Chairman **LEONARD**. I know of a young Hungarian in Ohio who had both hands badly mangled, just stumps left. We refer a great many of our cases to the rehabilitation service. He was given a course in drafting. To-day he is making \$60 a week, owns his own home, and has two children. That is what can be done with an injured worker if given the right kind of training.

Mr. **WILCOX**. You paid him something for permanent disability, didn't you? Why?

Chairman **LEONARD**. Because he suffered a loss, but we fitted him to go back into industry and put him on temporary total disability until the training period was over; we have a limit of \$3,750 for temporary total disability. When we get a young man or an older man who will cooperate with the rehabilitation service, we go along with him. When he does not cooperate, we lose interest in him. I think as to training that it is a question of each individual person. We have to have something to shoot at.

Mr. **DUXBURY**. The rehabilitation training is worth a good deal more to him than the money you gave him in the nature of damage for his physical injury.

Chairman **LEONARD**. You can never pay an injured worker for the loss of a member.

Mr. **DUXBURY**. Of course you can not. How can you say what proportion?

Chairman **LEONARD**. We have men who have lost both legs, and are entitled to pay as long as they live. They can hardly wait until they can get back into industry. We encourage them to go back and earn what they can, feeling it is in the interest of the public policy that it should be done.

Mr. **DUXBURY**. Of course. That is the purpose of the law.

[Meeting adjourned.]

WEDNESDAY, SEPTEMBER 24—MORNING SESSION

Chairman, R. B. Morley, general manager Industrial Accident Prevention Associations, of Ontario

Chairman MORLEY. We are all interested in the problem we have to discuss this morning, and I am inclined to think personally that the safety movement, both in this country and in Canada, and possibly elsewhere, is suffering from certain things that were done to it in the early days.

I think that as soon as we realize that accident prevention is an economic figure that must enter into every phase of industry, we are going to get results. If we put accident prevention on some high moral plane, every now and then some hard-headed business man is going to think it is just some new cult that has arisen in the land and we will not get very far with it.

I have about reached the point in my own work where, in talking to an executive of a plant, I prefer to leave out the words "accident prevention," and the word "safety," and talk efficient operation of his plant to him, because I think in the last analysis that is what our job boils down to.

There is one correction that I should like to read into the record of this meeting. Last year at Buffalo, at the afternoon session on accident prevention, I was quoted as having said that under section 114 of the workmen's compensation act of Ontario, approximately 99 plants have set up accident prevention associations. That is one of those cases where a couple of ciphers may mean a great deal, because it should have been 9,900 instead of 99.

I think a good many of you know in Ontario we have a clause in our act that authorizes the industries to establish these associations. We get our money from the workmen's compensation boards and in that way the costs are spread over the industry as a whole. It makes a very interesting proposition from many points of view. I think you have nothing of that type here in the United States. The costs are distributed fairly among the employers generally, and in that way we are able to carry on accident prevention work on a rather different scale.

We are here this morning to carry out the program laid down for us, and I am going to ask Mr. John P. Meade if he will give us his address on *The Influence of Factory Inspection on Plant Safety*. Mr. Meade, as you know, is connected with the Department of Labor and Industries of Massachusetts.

The Influence of Factory Inspection on Plant Safety

By JOHN P. MEADE, *director division of industrial safety, Department of Labor and Industries of Massachusetts*

Means to conserve the health of employees and to prevent occupational danger are now recognized as essential to successful business management. These principles are gradually pressing forward in the

progressive industrial establishments of to-day. The rapid and exacting nature of mechanical processes and the unwholesomeness of many industrial occupations have brought new risks to vitality and health. Great progress has been made in the development of factory inspection in the United States during the last 20 years. The efficient factory inspector of to-day is looked upon as the embodiment of a system of legislation which reflects the demand of an enlightened public sentiment to protect those whose work for society frequently means exposure to serious industrial hazards. His influence on plant safety is now well established, and the value of that safety to the individual, the home, and the community is recognized.

An eminent authority (in a survey which he made of industrial conditions in one of the leading manufacturing cities of the United States in 1908) gave expression to an opinion which he declared stated concisely the attitude of the industries in the United States toward workmen engaged in hazardous trades:

The Slavs from Austria-Hungary, the Latins from the Mediterranean Provinces, the Germans, or the British born who came to Pittsburgh to do the heavy work of manufacture came from a region of law and order to a region of law-made anarchy, so far as the hazards of industry are concerned, for there is scarcely a country of modern Europe but has brought its statutes abreast of industrial progress and wrought out for itself, as we have not, some adjustment between civil rights, human needs, and the ceaseless operations in which groups of men and powerful appliances join in producing what the world wants.

Since the time this statement was made the industries of the country have learned through experience the value of protecting the human side of industry. Much has been accomplished in making the work place safe and in securing control of conditions responsible for industrial accident and disease. Outstanding in the enactment of legislation in the various States are the laws which have been adopted to safeguard the health of the employee. New provisions to safeguard women and children have made their appearance. Processes in industry have been carefully scrutinized and the use of chemicals and toxic substances in the work place closely examined. Systematic inspection of industrial establishments is the general policy in all of the manufacturing States. Legislation has provided for the control of work-place dangers through the exercise of the police power. Classification is now made of accident-producing industries, and special attention is given to plants where human labor is actively associated with occupational danger. Through this means the protection afforded by statute for employees in work places is made possible.

Compliance is secured with laws and regulations for the safeguarding of dangerous machinery. Suitable lighting is furnished in work places. Exposure of employees to the dangers of inhaling irritant dusts and fumes is prevented. Sanitary requirements are enforced, including the regulations for suitable toilet and washing facilities, the adequate ventilation of industrial establishments, and providing pure drinking water, and enforcing the provisions restricting the employment of women and children, and the laws enacted for their protection. Dangers in the operation of intricate machinery and frequent changes in manufacturing processes still combine to bring occupational hazards to the work place. Preventing exposure to work dangers in the operating of machinery is one of the prominent duties

in the inspection service. This is mainly accomplished through the control of hazards at the point of operation and in providing devices to guard against the causes of accident. Regular supervision is given to power transmission equipment and emergency stopping devices; safeguarding of sprockets and in-running gears and set screws on revolving parts; belt and pulley equipment adjacent to passageways; vertical and horizontal transmission shafting, couplings and collars, and balance and flywheels are included. Protection of the eyesight and of the hands and fingers exposed at the point of operation on machinery figure prominently in this work.

Injuries of this type are usually of permanent partial character and arise largely from exposure to machinery dangers. They constitute a leading inspection problem in plants where woodworking and power punch-press machines are used. In the safeguarding of these machines close attention is given to the use of devices for the purpose of keeping the hands of the operator out of the danger zones.

In the briefest outline these facts set forth the nature of contact which has existed for many years between the industrial inspector and employers in the various trades. Out of this experience has come a new interest in the relationship of employer and workman which emphasizes the declaration that the labor of a human being is something more than an article of commerce. Slowly the conviction has grown that the human side of industry is of paramount importance in this machine age. The loss of hands and fingers or of limbs and feet; the loss of sight; and the loss of health through contact with industrial poisons are regarded as products of unscientific industrial waste. Accident-prevention work has now an integral part in the successful industries of the country. This is one of the fruits of factory inspection and manifests itself in plant safety.

Within the scope of this inspection work, building operations are included and regulations are enforced to maintain safe scaffolding and working platforms for employees in these dangerous trades. Safeguarding floor openings; furnishing adequate protection of material hoists; maintaining stairways in safe condition; providing devices to control the transmission and use of electricity of a dangerous voltage; protection from falling material; suitable types of ladders; and proper ventilation for heating apparatus used for the drying of plaster or other materials are all included in these requirements. During recent years employment hazards have multiplied in the building trades. An increase of work injuries has synchronized with the development of this industry. The use of high-speed mechanical devices, such as material hoists, power shovels, trench diggers, derricks, drills, and other machinery, and of high-powered explosives, has combined to produce this result. The dangers have multiplied with the number of man-hour exposures and have increased the number of accidents and heightened their severity degree. In this field the inspection service has accomplished much to maintain safety in the work place. Regular inspection of building operations is essential. Under this system encouraging results are obtained. Many illustrations of the truth of this statement could be given. The erection in the city of Boston of a large railroad station, with an adjoining amusement auditorium capable of seating 17,500 people,

was finished in 15 months without a single fatality and without anyone being seriously injured. At one time 1,400 men were employed on the different parts of the project, while 70,000 people passed in and out of the terminal each day. This experience demonstrated that large building enterprises may be successfully carried on without sacrifice of human life. From the beginning of its erection until the finish of the structure an inspector was assigned to cover the operations each day, giving all of his time to this project. He personally supervised every change of staging, scaffolding, and working platforms used in the erection of the building. Other inspectors worked with him at times when assistance was necessary. Contractors and employees, safety engineers, and insurance representatives joined effectively in a movement to prevent industrial accidents. To this work came efficient support from 78 subcontractors. The important achievement of the State inspector in this experience was to organize all the various groups for accident-prevention work. It was his contribution to the task of making the work place safe.

This result was duplicated in the case of another building in which daily inspections were made during a period of several months. Work accidents were slight, consisting largely of back strains, injuries from handling tools, and getting foreign bodies in the eyes. No fatal or serious accident took place. There was a maximum of 365 men employed at one time in its construction. The favorable attitude of the general contractor and the employees was made possible through the persistent efforts of the inspector. It is service of this kind that reduces accidents and makes the work place safe for the employee. The experience indicates that accidents are man made and can be man stopped.

In recent years the growing interest in the problem of consequence due to industrial accidents led to a movement for the better protection of employees working at the hazardous trades. Legislators lacking technical and expert knowledge had experienced difficulty in formulating effective measures. In some States the lawmakers did not attempt to enact provisions dealing with the point of operation of machinery, but remained content simply to declare in the statutes that work places must be made safe. As the need for more definite provisions to safeguard employees from dangerous exposure became known, legislatures passed enabling acts authorizing governmental departments to make rules and regulations to deal with intricate dangers in work places. The movement for accident prevention then reached a higher plane of efficiency. It marked a new era in conserving the human side of industry. The foundation was laid for a new system of regulation in industry to make work places safe for the employees. It rested upon the basis of expert knowledge of machinery construction and intimate acquaintance with the causation of industrial injury.

Many of the industrial States embarked upon an extensive plan in code making, while other States seemed inclined to a more moderate use of this power. The accident experience in some States had been used as a basis for activity in the development of this system. Sound judgment and experience seemed to approve this procedure.

Accident records clearly defining the danger zones in industry are now available in all of the industrial States. In some of these more than one-half the permanent disability injuries occurred in two industries, and the employee exposure to danger in this connection was restricted to a few typical machines. Efficient rules and regulations for the protection of workmen have been enacted to deal with these definite points. Enforcement of law under these circumstances is more productive of actual progress than a code with a multitude of provisions that fail to deal adequately with fertile sources of machine injuries.

Because of this experience the inspector has become a useful factor in the industrial life of the country. His intimate knowledge of work conditions and the causes of injuries to employees, and contact with manufacturing processes and diversified machinery, have made his experience of inestimable value to plant safety. His contributions in this connection are common incidents of the daily work. His plant visits bring him to work places with their attendant dangers. Machinery hazards are quickly recognized. Exhaust equipment to control dust, fumes, and gases are tested. Insanitary conditions and inadequate lighting facilities are noted and compliance with law required. Floors, stairways, and passageways are examined for obstructions over which persons may stumble and fall. Industrial poisons are discovered and methods of handling the same are scrutinized. Devices and containers are required to safeguard employees against exposure. These duties have been greatly simplified in recent years in the large industrial plants where organized accident-prevention work prevails. Safety committees have become familiar with the recognized plant conditions responsible for work injuries. In such establishments the influence of factory inspection is a potential factor in maintaining plant safety. The training and experience of the inspector make his contact an inspiration to the plant committee and stimulate its activity and interest in keeping the work place safe. This service is especially effective when accident investigations are made, and the causative factors in typical accident cases form the basis for joint discussion with the plant management. Expert knowledge in the control of plant dangers is joined with the daily experience of workmen in the pursuit of hazardous occupation, and out of this experience comes the best progress for the prevention of work injuries and the sustaining of plant safety.

Factory inspection exercises wide influence in the small plant. This type of establishment is usually without organized effort of any kind to warn the new employee of dangers lurking in the daily work. Contact with the factory inspector is the means by which interest is maintained in making the employees' environment free from accident-producing causes. When located in a tenant factory building the small establishment has special employment hazards. Elevators are found at times without regular operators and are used indiscriminately by employees of many concerns in the same building. This is a prolific source of injury to children who operate the elevators in violation of the statute. Safeguard equipment for elevators is often neglected in such places. Proper sanitary conditions are maintained only through frequent inspection. Special attention is needed in such establishments.

Under these circumstances many business ventures have had their beginning. Very little capital was invested in these places and effort is made to restrict expenses to actual production cost. Overhead charges are kept at the lowest possible minimum, and practically no allowance is made for keeping the work place clean and safe. It is in this environment that factory inspection has made its best contribution to plant safety. Here the inspector can make his appeal to those who are in charge of manufacturing processes. Exercising the police power of the State to make work places safe, he aims to secure the cooperation of the foreman in conserving the human side of industry. The management must be convinced that such work is practical and that it is essential to the progress of the concern. Employees must be made to realize that this movement is one of importance to them and their families. Locating the plant dangers or working hazards and establishing cooperation between workman and employer in reducing exposure to injury usually accomplish good results.

The smaller plant has the advantage over the larger one in this respect, as the employer and foreman are close to their workmen and able to maintain interest in keeping the work place safe. Here the foreman is the keystone in the arch of accident-prevention work. Through contact with the factory inspector he becomes well informed on the need for preventing work injuries. Danger points are controlled and employees exercise due care in the place of their work. In carrying out this program factory inspection is instrumental in maintaining the highest degree of plant safety.

The small plant is without the service of the safety engineer and the well-organized safety committee. It has its compensation, however, in the inspiration afforded by the contact between the factory inspector, the foreman, and the employees. Well informed on the dangers existing in establishments of this kind, the inspector's approach to the work is based upon his experience in a wide field of industrial activity. Familiar with existing traditions in the hazardous trades he locates at once the danger points in the plant, and his advice is usually listened to by nearly all the working force. He establishes immediate contact with the employee and interest in accident-prevention work is stimulated.

Among the problems created by the development of the industrial system is that of safeguarding the health of employees in work places. The rapid and exacting nature of certain mechanical processes and the unwholesomeness of many industrial occupations and environment have brought new risks to vitality and life. Conserving the life, health, and energy of our employees or wage earners is not an individual question now; it is a question requiring social action and is recognized as a legitimate function of government. Gradually, new principles born of this experience found their way into our industrial life. The theory advanced rapidly that immunity from grave industrial hazards and protection against occupational illness and disease were necessary to the well-being of our community life. Compensation laws spread rapidly throughout the country, recognizing this principle in part and inspiring interest in the work of reducing human waste in industry.

The side of this problem which deals with occupational diseases occupies an important place in the duty of the factory inspector.

His access to the industrial establishment with its intricate processes of manufacturing brings to him a practical knowledge of the toxic substances used in industry. Exposure to the inhalation of irritant or poisonous dust, fumes, and gases attracts his interest and attention in the course of his usual duties. Contact with these danger points in industry is the main principle of knowledge in his training. Disease hazards in industry may not always be so clearly defined as are the dangers that are responsible for industrial accidents. Doctor Thompson reflects accurately on the relation of occupational disease to industrial injury when he says:

A man's hand lies upon the workbench, cut off by a revolving saw—nothing could be more definite as to the relationship of cause and effect. He recovers from the injury and it is easy to determine the degree of his incapacity for future work. The attention is self-limited and nonprogressive. With industrial disease, on the other hand, many complex factors arise. Is the mercurial poisoning, of which he is the victim, likely to continue its destructive effects until the victim dies, or is he likely to recover completely upon cessation of this hazardous work?

These are the types of questions which constantly arise in connection with occupational diseases, and it requires far more experience and judgment to solve them justly and accurately than it does to determine the nature and cause of industrial accidents. Injuries sustained through the inhaling of metallic, mineral, or organic dusts often are more far-reaching than the results of traumatic amputations.

Chemistry has become an important factor in modern industry, producing greater possibilities and higher efficiency. It has made possible the manufacture of products highly toxic and dangerous. New problems born of this experience have crossed the path of the industrial inspector. Poisons or corrosive chemicals encountered in this industry must be handled as far as possible in closed equipment and, when it is necessary, under the protection of elaborate ventilating systems. Under these circumstances hazards peculiar to the industry are largely eliminated and controlled. Goggles, gas masks, protective clothing, and proper shoes are provided for emergencies arising in the trade. The manufacture and handling of certain materials, including lead, benzol, aniline and its derivatives, mercury, and arsenic are now established health hazards, and methods of protection against them are well organized. The inspection service becomes well trained in the work of protecting the health of employees who are exposed to these dangers. Chemicals are studied as to how they may produce injury to health, and effort is then made to surround the handling of these materials with means to safeguard against exposure. Experience of this type leads to a correct understanding of existing dangers and is the basis for adequate control of hazards to the health of the employee. Environment of this kind leaves its effect upon the inspector. It yields to him secrets of knowledge which are of great value in protecting the workman in his employment and conserving the productive power of labor for management.

In establishments where these conditions prevail employees do not eat in workrooms where the injurious chemicals are handled or manufactured, neither do they carry matches nor do they smoke in places where inflammable liquids or gases are present. Employees do not

enter a tank without knowing whether it contains fumes or vapors of a dangerous nature and without availing themselves of the protection necessary while engaging in duties of this kind, and they do not neglect to clean tools which have been in contact with poisons or explosive materials. Also, they exercise care in the sweeping of floors or walls and in the cleaning of machines during working hours so as not to cause dust of a dangerous nature to circulate in the workroom. In plants where this teamwork prevails there is usually found an adequate supply of good drinking water and running hot and cold water for toilet and washing facilities. Clean windows, floors, walls, and ceilings, covered receptacles for waste, and an efficient system of ventilation for the removal of dusts, fumes, vapors, and gases are provided, efficient first-aid equipment is available for the early treatment of eye injuries, cuts, bruises, or burns.

This experience in late years has accomplished much in training the inspector to keep abreast of the health hazards arising in modern industry. The exposure of employees to conditions dangerous to health is now a prominent item in the work of factory inspection. Processes involving the use of industrial poisons receive careful examination. Regular supervision is now given to plants where these work dangers prevail, and cooperation of the management is secured to safeguard against unwholesome conditions.

In 1929 the factory inspectors of Massachusetts reported 2,500 places of employment in which industrial poisons were found in use. These were handled by employees in the course of their work. Plants in this connection included shoe manufacturing; making of rubberized fabrics; wood heels and textile fabrics; storage batteries and metal plating; leather finishing and the manufacturing of rubber; brake linings; watches and jewelry; refrigerators; paints; automobile-body manufacturing; and the making of other products. In these manufacturing concerns certain processes require the use of acetone, cyanide of potassium, aniline, lead oxide, benzene, chromic acid, mercury, sulphuric acid, turpentine, oil, and other toxic substances.

In contrast to these conditions is the inspector's experience in other types of industry. Reference to these can be made here in the briefest outline. In the granite-cutting trade silicosis arises from the inhalation of mineral and metallic dusts. Machines are used to produce a smooth surface on the rough stone. These machines are equipped with a 4-pronged pick hammer and four grades of bush-hammers, which produce the smooth surface. Intense clouds of dust are set up in the course of this work, and a device for the removal of dust, operated with exhaust equipment, is placed in proximity to the cutting hammer. While the surface-cutting machinery in the granite industry is now generally provided with this equipment, great difficulty is experienced in providing adequate protection for the hand pneumatic-tool worker. In this employment occupational danger is common because of the problem in providing control for the trade exposure. Finely pointed, pneumatically actuated chisels for producing ornamental designs and statues are used by carvers, while letterers employ these means for placing inscriptions on monuments. Unusual problems of this kind tend to broaden the inspection vision and afford training in the hazards of

industry, and they stimulate interest in the acquiring of knowledge to control dangers and provide means to protect the health of skillful workmen.

Let me describe the factory inspector's investigation of industrial anthrax poisoning. Twelve cases of this occupational disease were reported to the Department of Labor and Industries in Massachusetts in 1929; 9 of these occurred in tanneries, 1 employee worked as a truck driver, another in a laboratory, and another in a textile mill. Three of these cases were fatal—

No. 1.—The first was an employee 37 years of age; married, and had five children. His work was in the beam house, and his duties consisted of gathering and removing masses of goat's hair from the cement floor in the rear of the dehairing and fleshing machine. He wore rubber boots, gloves, and apron as he shoveled the hair into hand trucks and transported this material out into concrete yards of the premises. The raw stock used by this establishment consists exclusively of goat hides imported from India, Russia, Italy, and China, and is trucked to the tannery from the Boston water front. At time of inspection there were present in the stock room over 200 bales of Italian hides, each one weighing between 350 and 450 pounds. There were also over 200 bales of India hides, and these bales weighed from 850 to 1,200 pounds each.

In the beam house the hides are dropped down from the stock room through floor traps. They are first soaked for 48 hours in vats of water, sodium, sodium sulphide, and sodium hydroxide. Afterwards they are placed in lime vats for two days and rendered plastic and flexible by revolving for several hours in the large milling drums. The beam house has a wet cement floor which slopes toward the drain, from which the material is carried to a settling tank in the yard, where the liquid goes out to the sewer and the screened solid refuse is treated with live steam. The India hides are surrounded with matting, which is removed and burned in the boilers, as are also connecting ropes and twines.

The deceased wore rubber gloves and apron in common with the other operators, and records show that from February 25 to March 4 the operators machined and handled a variety of hides from India, China, Russia, and Italy. The foreman noticed a spot on the middle section of his neck, and he was immediately sent to the physician, who washed the painless lesion with lysol and mercurchrome, and applied boric acid. The medical history indicates that he continued at work, but returned to the physician three days afterwards in a critical condition, with marked swelling of the tissues of the neck and upper chest. An operation was performed and a pustule of large size removed. Swelling and hemorrhagic condition of chest and abdomen increased, and he died the day following the operation. The building used was of old construction type. It lacked facilities for good light and ventilation. Sanitation was not adequate. Proper toilet facilities were not provided. Orders issued by the department requiring compliance with law in these matters were promptly complied with.

No. 2.—The employee was a man 49 years of age. His dependents included a widow and a minor child. He was employed in a leather-finishing plant, taking skins out of a liquid soak. Some of the water in which the skins had soaked splashed up into his eye. This caused an infection, and he was taken to the hospital, where he died nine days afterwards. The primary cause of death given in the certificate filed by the physician of the local board of health was that of anthrax, with resulting septicæmia and the eye lesion as a contributing cause. In the establishment where this man worked 200 persons were employed and sanitary conditions prevailed. Adequate facilities were furnished for this purpose. Good ventilation was provided and first-aid treatment was available for employees. Aprons, gloves, and rubber boots were provided for employees when these were necessary.

No. 3.—This workman was 61 years of age and was employed as a wool opener. He worked in a large textile establishment employing 780 men and 857 women. This man went to the first-aid room for the purpose of seeking information concerning a pimple on his chin. The registered nurse in charge advised him to seek the proper treatment at once, and a physician was called

who operated and took smears for analysis. Positive diagnosis was made as that of anthrax, and he died on January 25, 1929, leaving a dependent widow. Woolen carpets were manufactured, and this employee worked in the wool house preparing the material for use. Report of the inspector indicated the wool supply sources of this concern were in South America, China, and various parts of Europe. In this establishment compliance with all of the labor laws is regularly maintained. Sanitary conditions prevail. Good ventilation is provided. Effort is made to protect the health and safety of employees. First-aid facilities are of high order. Organized effort is made to prevent injury of employees.

Of the nine other cases seven occurred among employees in or about the beam house who open bales of skins and place them on trucks. Usually these skins are dumped through the open traps down into the liquid-soaking vats on the floor below. Rubber gloves, aprons, and rubber boots are usually worn in the course of the work, that includes removing the hides from the sulphide and soda pits and conveying them on wheelbarrows to the lime baths. This room is provided with a concrete floor and the walls are whitewashed. Disinfectant solution is used regularly on the floor. Wash room and shower baths are provided for the employees. Some of these establishments are visited daily by a plant physician, who gives physical examination to the employees at their request.

Practical knowledge of health dangers is best obtainable through the investigation of occupational disease. This system affords useful opportunities for becoming acquainted with the causation of occupational illness. It constitutes the most efficient school for the training of the industrial inspector. It acquaints him with the disease-producing causes in the industrial plant and enables him to become expert in methods for their control. It lays the foundation for an experience which makes factory inspection a potent influence in plant safety.

To this discussion and in support of this statement I would bring the Massachusetts experience in investigation of occupational diseases for the year 1929. The record indicates that there were 554 cases of occupational disease investigated during the year. These included 493 men and 61 women. Eight of the cases were fatal and all were men. The diseases are classified as follows: Dermatitis, 345; lead poisoning, 70; gas poisoning, 69; chrome poisoning, 22; industrial anthrax, 12; pneumoconiosis, 9; cyanide poisoning, 5; dust poisoning, 5; tuberculosis, 5; silicosis, 4; benzol, 2; miscellaneous, 6. Of these 554 cases, 345 were concerned with diseases of the skin in which the period of incapacity for employment, as indicated in the experience of the State with work injuries, is comparatively short. No diseases of occupation from the inhalation or irritation of poisonous dusts, gases, or fumes occurred to children under 16 years of age in this group. The statutes require that such cases be reported by the employer to the department of industrial accidents, and all records in this connection are required by law to be available for use by the department of labor and industries. This is the chief source from which information concerning these diseases is received. It provides the basis for the investigation of occupational diseases in Massachusetts. In each of these 554 cases a statement was secured from the attending physician, as required in section 11, chapter 149 of the General

Laws, indicating in his opinion that the patient was suffering from an ailment or disease contracted as a result of the nature, circumstances, or conditions of his employment. The investigation of these injuries included an examination of the work place and of the extent of exposure of the employee, and the reports made were carefully supervised by the physicians on the inspection staff. In the pursuit of this work special inspection was made of the work place in establishments in the following industries:

	Cases		Cases
Textile	113	Battery manufacturing.....	15
Tanneries.....	71	Painting.....	10
Shoe manufacturing.....	51	Garages.....	8
Rubber.....	35	Lumber.....	8
Metal trades.....	35	Granite.....	4
Foundry.....	23	Brake lining manufac-	
Printing.....	20	turing.....	9
Chemical manufacturing.....	20	Electroplating.....	6
Electrical.....	20	Mercantile.....	13
Construction.....	22	Miscellaneous.....	60
Paper mills.....	11		

The employees worked at these operations:

Metal products.—Nickel plating; metal polishing; lead casting; molding; furnace men; ladle men; millwright; machinists; painters; sprayer.

Rubber.—Millman; calender operator; mixer; gaiter maker; bootmaker; sorter; laborer.

Shoe manufacturing.—Repairing; staining vamps; treeing shoes; cementing heels; scouring heels.

Foundries.—Making bronze castings; cleaning and dipping castings; pouring molten metal; operating furnaces; chilled molding; wet tumbling; sand blasting; operating tumbler mills.

Tanneries.—Helper in dye-mixing room; hair and felt work; seasoner; sorting wet skins; swabbers; fleshing-machine operators; making tan; beam-house worker.

Textile mills.—Back tender; kettle man in dyehouse; tub washer; slubber; printer; color mixer; dyeing and wet finishing; wool scouring; cotton sampling.

Miscellaneous.—Nickel plating; handling paint; mixing putty and lead; burning lugs; enamel spraying; hydraulic press operator; handling chemicals.

The causation of these diseases was traced to the following:

Manufacturing establishments.—Dipping hands in caustic solution; repairing truck in garage; handling junk; inhaling dust from sandpapering metal; fumes from salamanders; chromium fumes from plating tank; chromium acid used in solution to clean plates and various dyes; working in tank with acetylene torch.

Textile mills.—Handling dye-saturated materials; weighing dyestuffs; handling wool sprayed with solution of mineral oil; washing colors from tubs; placing yarn in chrome; handling wool soaked in sulphuric acid; using potash and water to remove the color from hands; treating brake linings with asphaltum; handling acids and dyes.

Shoe factories.—Handling cleansing agents for shoes; inhaling leather dust and naphtha cement fumes; using formula to repair *vici kid* shoes.

Metal trades.—Dipping metal frames into solution; grinding copper oxides; cleaning nickel parts.

Rubber mills.—Handling compounds; cementing rubberized cloth fabrics.

Foundries.—Inhaling hydrochloric acid fumes; inhaling silica dust and metal fumes; gas fumes escaping from ventholes; lead fumes from molten mixtures.

Tanneries.—Handling skins soaked in chrome solution; making tan from soda, sulphuric acid, and prepared chrome; cuts infected from lime or caustic soda; daubing aniline black, aniline blue, and sulphate of iron; in leather finishing processes; handling hot rubber; spraying leather with air guns; mixing thinner of toluol, butyl, and amyl acetate; operating spray guns; handling dry and salted hides.

To prevent the recurrence of similar diseases of occupation, improvement was made in the exhaust systems in many cases. In some of these, better ventilation was provided in the workrooms, and suitable washing facilities made available. Other means included adequate hot and cold water with shower baths, lockers, medical chests, first-aid rooms, respirators, goggles, masks, wooden shoes, rubber aprons, rubber gloves and oilskin sleeves, canvas shoes and aprons, and suitable eating places. Daily experience in contact with the conditions in industry in which diseases of occupation lurk soon makes the intelligent inspector an expert in this line. His accumulated knowledge is at the service of employer and workman, and his influence is an active factor in plant safety. In the safeguarding of machinery his contribution to plant safety stands out in concrete achievement. This is the experience of nearly all the industrial States. Machinery accidents have been reduced and operating dangers have been diminished. Inspection supervision during recent years has produced this result. Comparative figures taken from the Massachusetts experience indicate this fact. The improvement in this respect is well established even in the absence of definite information concerning the number of man-exposure hours. The figures for the years 1919 to 1929 are given herewith:

Machinery accidents by manner of occurrence

Manner of occurrence	1919	1929
Starting, stopping, or operating machine.....	9, 675	3, 318
Adjusting machine, tool, or work.....	1, 758	598
Flying objects striking operator.....	3, 285	733
Cleaning or oiling machine.....	1, 298	537
Breaking of machine, tool, or work.....	620	239
Repairing machine.....	223	86
All other.....	1, 631	2, 336
Total.....	18, 490	7, 817

Reduction in time lost by employees through machinery accidents has taken place. For the year ending June 30, 1919, machinery accidents were responsible for 33.6 per cent of all days lost because of injuries to employees in the industrial establishments of this State. The percentage of days lost in these accidents gradually decreased each year until it fell to 20.7 in the 12 months ending June 30, 1928. Another indication of efficient inspection work in the safeguarding of machinery will be noted in the drop which has taken place in permanent partial disability injuries in the past decade. There were 1,750 cases of permanent partial disability, or 2.5 per cent of all the tabulatable injuries for the year ending June 30, 1919. In the 12 months ending June 30, 1928, the total number of permanent partial disability injuries dropped to 1,197, or 2 per cent of all the tabulatable accidents. Nearly all of these injuries were ascribed to contact with machinery, and included amputation or loss of fingers, thumbs, toes, feet or limbs, or the sight of eyes. In this period, eye injuries have been reduced. In 1919, loss of sight in one eye occurred in 115 cases, while in 1 other case the sight in both eyes was lost. In 1928, 73 sustained the loss of sight in one eye, and 1 in both eyes. In these results may be seen a practical contribution by factory inspection to plant safety.

Turning to the problem of nonmachinery accidents and their increase in recent years, greater difficulty is experienced in keeping the work place safe. These injuries are due to widely different causes. Accident-prevention work in this field is difficult, because it involves the human equation and is concerned with the exercise of due care. No mechanical devices can reach or control the underlying causes of these injuries. Handling objects and falls are still the leading causes of these accidents in Massachusetts. The handling of objects during the year 1929 caused 19,326 (32.1 per cent of all) tabulatable injuries. These included 26 fatalities and 204 permanent partial disability cases. Falls of persons resulted in injury to 9,214, or 15.3 per cent of the injuries for that year. These injuries included 63 fatalities and 52 permanent partial disability cases. Accidents due to machinery were 7,817, or 13 per cent of all such cases. In connection with these injuries, 14.7 per cent were fatal and 61.8 per cent were permanent partial disabilities.

Many falls occur through incidents that can be brought within control. Slipping on the floor is the cause of many sacroiliac injuries to employees. These injuries are painful and are usually followed by an extended period of incapacity for work. Such occurrences guide the factory inspector in making careful examination of floor conditions in industrial establishments, and he has statutory authority to require that passageways and gangways be of even surface, kept clean, and in good repair and free from nails and tools or objects over which persons might stumble and fall. Dripings from humidifiers in textile mills often produce hazards of this kind. Oil-soaked spots at the end of looms make the work place dangerous for employees while engaged in their ordinary duties. Unclean or littered floors, unsafe methods of storing, packing, and placing materials have done much in recent years to increase the number of nonmachinery accidents. This problem is now an outstanding one in accident-prevention work and is receiving the attention of the factory inspector. In plants well organized for accident-prevention work, much progress has been made in reducing injuries of this type. In this connection factory inspection is a potent influence in attaining plant safety. It is the power house which supplies energy to the work of conserving the human side of industry. In these days of great industries and mass production, accident-prevention work is necessary. Work places must be made safe if industry is to be humanized. Dangerous exposures in the course of employment must be controlled. These conditions have an important bearing on the economic and social system of the country. They are closely related to the well-being of the individual, the home, and the community. These are outstanding and basic problems in the relations between employer and workman, and provide the highest motive in factory-inspection work to accomplish plant safety.

DISCUSSION

Chairman MORLEY. Mr. Charles H. Weeks, Deputy Commissioner of Labor of New Jersey, is to lead the discussion on the paper.

Mr. WEEKS (New Jersey). I deem it a great privilege to be called upon to discuss Mr. Meade's very comprehensive paper on The In-

fluence of Factory Inspection on Plant Safety. This subject has been covered in a most capable manner, and his long connection with industrial safety work makes him an undisputed authority on such inspections and safety work.

Mr. Meade's statement that factory inspection has been greatly developed during the past 20 years is absolutely correct. It is a known fact that factory inspectors are welcomed by many of the manufacturers who formerly looked upon such an inspector as a public official wielding a big stick and using his authority to prosecute factory owners. Trained factory inspectors have been of valuable assistance and have furnished information and instruction that has been of great benefit to industry.

Factory inspections by persons qualified to talk safety in a practical manner have become a necessity, especially where mechanics or practical persons are not employed or where safety representatives or committees are not in evidence. Many factory owners have been anxious to make their places safe and free from accidents, but did not seem to comprehend the best way to provide the proper safeguards that would prevent accidents and not interfere to any great extent with their processing or production.

A factory inspector, whether he be a State, a casualty, or a safety representative, should always be a thoroughly trained person who can intelligently discuss subjects and problems involving the need to provide practical and adequate equipment that will be of some value in providing safe conditions and who is familiar with the fundamental principles of safety protection.

Inspectors should be given every opportunity to keep abreast with the progress of the safety movement and to become familiar with improvements in safeguarding equipment and with any propaganda which will assist them in their work. They should be familiar with safety equipment that has been provided but is not functioning as it should, and be able to report the exact causes of its failure.

It is a good plan to encourage inspectors to attend safety rallies and safety meetings, to organize safety units in plants, and to address meetings on safety problems. Occasionally our inspectors plan for educational safety gatherings at plants in their districts and are encouraged to take part in safety campaigns. We also arrange for their attendance at demonstrations of safety appliances, elevators, and fire-protection equipment, and have them appear occasionally at the New Jersey Museum of Safety to witness tests of new safety equipment placed before the department of labor for approval.

The most difficult problems a factory inspector has to contend with are generally found in the smaller plants and the tenant buildings. In a building where there are several different manufacturers doing business, especially the poorer type of manufacturer, very often conditions are permitted to exist that are not in line with safety practices.

It has also been found on numerous occasions that concerns in this class can not see the importance of safety work and have very often refused even to comply with the law. We have, however, been successful in obtaining results from such factory owners by having their representatives appear for a hearing to show cause

why they should not be prosecuted for violating the law, and in only a few instances have we failed to receive their full cooperation after explaining how their failure to comply with the factory laws and regulations and to provide safe equipment might cause a serious accident which would result in the loss of time of one of their employees or serious damage to their building or equipment.

We refrain from recommending prosecution for violators of the law wherever possible and only resort to such action when we have failed through the efforts of safety conferences. We will not, however, tolerate for any length of time violators of the fire-protection, child-labor, and wage-payment regulations and plants where extremely hazardous and dangerous equipment is reported.

To verify what I have outlined previously in regard to the factory inspectors receiving assistance and cooperation from factory owners, our records indicate that during the last fiscal year there were 3,818 orders issued by the 22 factory inspectors, calling for changes in structural conditions, sanitary improvements, and electrical and mechanical requirements. The orders complied with during the same period were 4,860—1,042 more orders being complied with than were issued during the year. We are naturally very proud of results of this kind, and while there are many places that have bad conditions we feel that we are gradually correcting such places and will bring them into line in the near future.

Orders issued by our department carry different time limits for compliance and are extended from time to time according to the progress being made on such orders and the reports of our inspectors as to the cooperation they are receiving in connection with the removal of violations of the law found in the building.

Legislation that is continually being enacted making it mandatory for industries to provide equipment to safeguard the life, limb, and health of their workers enables factory inspectors to insist on protection to buildings when the owners fail to cooperate or assist in making their plants safe and to comply with the safety committee's recommendations. The creating of codes is looked upon by inspectors and safety committees as being very helpful. It enables them specifically to outline the contemplated improvements in the way of safety to be provided in a practical manner and in line with what they may be called upon to provide by any safety representatives.

The work being performed by the United States Bureau of Standards at Washington is commendable, as it is not only providing codes which are set up by practical and experienced committees composed of Federal, State, and local enforcement organizations, insurance and rating boards, and representatives of industries handling and manufacturing equipment for factories, but is also establishing a United States standard. This is very helpful, especially to the concerns coming and going from State to State. If these national codes could be adopted as far as possible by the different States, it would be the right step forward.

Very often manufacturing concerns change their State location and have machinery and other equipment which has been equipped in compliance with the regulations of a certain State, and in order

to comply strictly with the new requirements they are often compelled to change some part of their equipment. By having an effective national code operating in all States, this embarrassment is not likely to happen.

The New Jersey Department of Labor has prepared several safety standards for the protection of all classes of transmission machinery and mechanically driven equipment, power presses and foot and hand presses, woodworking machinery, laundry machinery, rubber-working machinery, and abrasive wheels, with complete specifications referring in detail to the manner of construction and the use of such devices. These codes are the result of years of cooperative effort on the part of national, State, and engineering bodies of the highest standing and represent the best thought in the country.

Particular stress is laid on the most severe of the hazards found in our manufacturing establishments, the abrasive wheel, rubber mills and calenders, power punch presses, jointers, saws, and all gear hazards. In guards for abrasive wheels, usually termed protection hoods, the design of the devices is of as much importance as the material and thickness entering into their construction, and they can not be termed "safe" if they fall below the specifications carried in the abrasive wheel code issued by the department of labor. Another very severe hazard is found in the working of rubber, where a man is liable to serious injury if caught in the rolls of these machines without effective means of stopping the mill or calender. The requirements as set forth in our rubber mill code indicate that certain bar controls, supplemented by cable pulls, in the case of calenders, shall be provided and braking facilities applied, and the distance of travel of the different size rolls is very clearly specified. In the case of point-of-operation guards, each group or classification of machines requires separate treatment involving experiments, tests, and trial of the guard for a period of time under actual working conditions before approval of a device can be considered. The application of these point-of-operation guards not only reduces the accident ratio but increases the production as well, due to the ability of the operator to speed up without fear of injury.

One of the most important and little understood safety movements in the field falls under the heading of "industrial illumination."

Altogether insufficient consideration is given to the relationship of adequate lighting facilities with the problem of production, and we have been informed that 18 per cent of our industrial accidents are directly or indirectly due to defects in lighting installations in our industrial buildings. While the major consideration in the eyes of industry is undoubtedly the money value of good lighting in the return of both quality and quantity of work, it is more or less difficult to interpret into dollars and cents the value of good lighting. A very good example of increased production and practically the elimination of accidents came to our attention in one of our industries where a serious complaint had been made by the workers concerning poor ventilation. Upon investigation, it was found that the air in the plant was completely changed several times an hour and that the cause of fatigue could not be laid to lack of ventilation.

Upon further investigation, it was determined that the fatigue was caused by poor illumination resulting in serious eyestrain. This condition was corrected by the installation of a modern lighting system, with the result that this source of injury to the worker was entirely eliminated, and in addition to this, there was a net increase of from 12 to 16 per cent in production. It was further found that spoilage had been reduced more than 50 per cent. This would seem to prove conclusively the value of proper lighting in our manufacturing establishments.

Statistics of accidents are indeed a very important factor not only in connection with factory work but in general safety propaganda. The recording of accidents and classifying them have enabled inspectors, manufacturers, safety committees, and safety organizations intelligently to discuss the need of safety work and has enabled factory inspectors, on visiting a building in which a violation is found, to explain to the owner, from the statistics in their possession, how an accident has happened and will continue to happen while such violation is in evidence. The influence of such information has brought good results and has enabled the factory inspectors and safety committees to explain in a comprehensive manner the reasons the protection is desired. We find in our work that many manufacturers and factory owners have complied with the law in installing equipment that was meant to prevent accidents or injuries to persons, but the equipment, after installation, had been given very little attention and had been allowed to deteriorate and to become out of service and in need of adjustment or repairs of some character due to the absence of proper instruction to the employees regarding the importance of the protection.

The placing of safety equipment in a building does not mean that the building is adequately protected, unless such equipment is carefully maintained, looked after, and inspected frequently. It has been reported that safety equipment which has been installed in a satisfactory manner as recommended by the inspector has caused accidents. On investigating these accidents it was found that they were caused by the equipment in question not being kept up to standard. This whole propaganda charges accidents of this character up to the real official definition for accidents, "*carelessness.*"

We all know that a safeguard of any kind for any building or piece of equipment is absolutely useless if it is not followed up by furnishing the workers with instructions as to the use of such safeguard and as to the importance of keeping intact the equipment provided to protect life, limb, and health.

Educational safety work in plants where the worker is reached, as conducted in New Jersey by the department of labor, has proved of great value. This can be verified by the number of plants taking part in our "Lost-time accident contest" and receiving testimonials for operating for certain periods without any time lost due to accidents.

Statistics compiled by the Bureau of Industrial Statistics of the Department of Labor of New Jersey indicate that during the year ending December 31, 1929, there were 27,975 nonfatal accidents recorded in the State. Of these, 6,716 were caused by the falling of persons and objects not being handled by the injured person,

9,520 were caused by objects and tools being handled, and 1,846 by stepping on or striking against objects. Only 4,062 of these accidents were caused by machinery. Almost one-half (49.6 per cent) of the compensable accidents in manufacturing industries caused by machinery resulted in temporary disabilities only. Machinery accidents were as follows: Fatal, 38; permanent partial disability, 2,027; temporary disability, 2,036; total, 4,101 fatal and nonfatal accidents.

I am outlining these items briefly, and Col. Charles R. Blunt, our commissioner of labor, would be pleased to furnish anyone desiring the same a full statistical copy of all the accidents, both fatal and nonfatal, that took place in New Jersey during the calendar year, together with the causes, industries, and occupations in connection with these accidents.

I was greatly impressed with that portion of Mr. Meade's paper in which he refers to "operations in connection with building construction," in connection with which there are recorded annually a number of accidents. Our statistical reports show that in New Jersey last year there were recorded 2,125 accidents in the building construction trades. Trades working on building construction very often use different types of equipment, and therefore scaffolding, hoistways, hatchways, platforms, etc., need most careful supervision, and an inspector visiting construction jobs can not possibly watch the changing of conditions in the way of moving scaffolding, platforms, ladders, etc., frequently. Arranging for a permanent inspector familiar with safe building methods to be on a construction job until the scaffolding, ladders, hoistways, and platforms are eliminated is essential, and if possible should be arranged for. Where a job is not large enough for one man to supervise safety, jobs could probably be grouped so that the smaller jobs would not necessitate a man continually on the premises, but he would be enabled to keep in touch with the different jobs he is to supervise at more frequent intervals. Jobs where there are a great number of people employed, such as Mr. Meade speaks of, clearly indicate that this plan can be comprehensively adopted.

Several attempts have been made to formulate a national building construction code, but without success. New Jersey, however, during its 1929-30 legislative session, passed a safety construction code, known as chapter 185, Laws of 1930.

While an inspector is covering a factory, mill, workshop, mine or quarry, bakery, confectionery, or mercantile establishment, with an effort to have the machinery, sanitation, electrical equipment, fire protection, lighting, boilers, and the employment of women and children looked after as prescribed by law, educational work is being planned by the inspector outlining and explaining the importance of the safety equipment recommended and the keeping of it in a serviceable condition. Safety committees working along these lines have also been very valuable to the factory inspector and have assisted in maintaining safeguards and safety equipment when other methods have failed.

In New Jersey a very satisfactory method of following up general factory safety conditions has been the organization of factory chiefs. There has been appointed a factory chief in factory

buildings employing 50 or more people. These factory chiefs are selected by the factory owner and appointed by the commissioner of labor, provided with a book of instructions and a badge, and receive all available safety data such as the department of labor releases. They look after the general fire protection, the house-keeping, and see that safeguards are used and in place, and cooperate with the factory inspector.

The detection and prevention of occupational diseases occupy, of course, an important place in the everyday work of the district factory inspector, for not only is he responsible for the maintenance of safe premises in his group of plants, but his experience and knowledge as a trained investigator and his access to all workshops under his jurisdiction give him first-hand knowledge of the toxic substances used in industries that may cause sickness or death.

So much has been written about the danger that lies in the inhalation of irritant dust created by industry that it is quite likely that to-day factory inspectors are well informed on the subject, and in the general run of industries are quite competent to make recommendations that will provide a maximum of safety. In our State for many years we have had the advantage of using safety codes governing the construction of exhaust systems that enable the inspector to furnish the employer with engineering information based on sound operating practices. Each inspector is furnished with a copy of our Sanitary and Engineering Industrial Standards that cover nearly every type of dust exposure commonly found in the industries of the State. Before the department adopted definite engineering standards of this kind, dust-removal systems were not installed in an effective manner because the competition to secure business was so keen that unscrupulous contractors were willing to submit a low bid and then install an inferior system in order to make a profit. This practice, owing to the adoption of a mandatory code, has ceased. Engineering concerns engaged in dust removal work all meet on a common ground and their ability to secure business is based on salesmanship and experience rather than upon those lower predatory trade practices. There are cases in which poisonous or highly irritant dusts can not be controlled, in which instances it is a good policy to ask the employer to provide air line masks that supply the wearer with fresh, clean air from a compressor. The ordinary filter mask furnishes meager protection and very little dependence should be placed upon its effectiveness.

The chemical industry has advanced so rapidly in this country and its products have increased so enormously that plants which either produce or handle poisonous chemical products furnish real problems that are often difficult to solve. In New Jersey we have a list of substances that come under the workmen's compensation law. This list covers the trade poisons, the toxic properties of which are best understood and are most commonly used in our trade activities. Since the passage of legislation that provided compensation for occupational diseases, the medical fraternity has become more familiar with symptoms and as a consequence the reporting of diseases of this kind has become more perfect. To facilitate this work an industrial-disease institute was held last winter in the city of Newark. This project was promoted by the New Jersey State De-

partment of Labor, the Newark Safety Council, and the Essex County Medical Society. The attendance at the institute numbered about 300, and comprised doctors, lawyers, claim adjusters, plant managers, nurses, safety men, and in general people who by reason of their occupation, mechanical or professional, had some interest in the prevention of occupational diseases. Lectures were given by trained experts, men of nation-wide reputation, and the institute did a great deal to promote a stronger professional interest in diseases of occupation and their prevention. New Jersey is peculiarly interested in the prevention of occupational diseases because we handle more poisonous trade products than any of the other States.

I think it is highly important for factory inspectors and labor-law administrators to become familiar with these various subjects for they are much more difficult to understand than the issues that are involved in structural or mechanical safeguarding. Visible hazards are not difficult to detect, and sound engineering has provided remedies for their correction. In the case of occupational diseases, however, the influences to be met and overcome are secret and subtle, sometimes baffling expert professional skill and, therefore, it is incumbent upon labor-law enforcement bodies to provide employers, the medical fraternity, and the inspection department with the very best information attainable. It should be understood that most trade poisons are subtle in their action and that while certain workmen have been known to resist an exposure for long terms of years, in the final analysis their breakdown in health and death are sure.

In the textile leather industry in New Jersey we knew of two brothers who had worked for more than 20 years finishing leather with a coating compound that contained benzol. These men finally succumbed to the influence of this toxic fluid and died within a few months of each other. We should not subscribe to any theory that advances the thought that certain men are immune to grave exposures to toxic substances of this kind. Prevention, which means protection from contact with the substance or avoidance of the inhalation of vapors, or the ingestion of dust is the only sure way to safeguard workmen.

During the past fiscal year there has been a total of 296 occupational poisonings in New Jersey; 289 of these were nonfatal and 7 fatal.

Chairman MORLEY. Mr. Gernon will carry on this discussion. Mr. Gernon is known to most of us as the director of the Bureau of Inspection of the Department of Labor of New York.

Mr. GERNON (New York). I should like to say that in opening, the chairman touched on a very vital point in this entire problem when he spoke of efficiency. On repeated occasions I have said that nothing is so wasteful as industry. That is quite a broad statement, but I think I am at liberty to make that statement after seeing industry in the principal industrial State, where there are at least 72,000 industrial manufacturing establishments to say nothing of other mercantile establishments.

If we could eliminate the inefficiency in industry, we would greatly reduce injuries. Efficiency is the hardest thing to sell to anybody.

You can not give it away, because the average plant manager who is running a plant that is not efficient never wants to hear about it. In industry, as you see plants you will see more efficiency in the smaller plant than you will in many of the larger plants, notwithstanding the fact that the large plants have plenty of money to spend for all kinds of good equipment, but they do not always use it properly.

There is another thought that I should like to leave with you. I think that we have reached the point when we should stop talking about these industrial accidents. They are not accidents—only a certain portion of them are. An accident is anything occurring unexpectedly or without known or assignable cause. If we were to take the industrial injuries that occur in this country which do not come under this head or this definition, and we were able to tabulate them, you would be amazed. If plant management fails to see the things that are causes of injury, to my mind it is not capable management; so the inspector performs a wonderful service. He has to point out to management many things that management does not see.

There is a reason for that. In my experience in entering industrial plants, when you point out what might be inefficient conditions, point out what might be efficient management—"here is a condition which should be remedied"—invariably a statement similar to this is made: "I have passed that every day and never noticed it. I know it is wrong."

The man who goes through the average plant with the cares of the industry on his mind, whether he is the manager or someone else in supervision down the line, has many things to think about, and he does not always think about the things he should think about. There is no reason in the world, if industrial management is efficient, that it should not be so all the way down the line, so that the key man, who is the foreman, would protect the men who work under him.

Another appalling thing to my mind, when we realize the hundreds of millions of dollars that industrial injuries cause, is that we spend so infinitesimal an amount of money for inspection or prevention. If we spent a decent amount of money for protection, in proportion to the cost of industrial injuries, there would be fewer people injured and there would be less misery in this country.

The paper presented by John P. Meade clearly indicates the influence of inspection on plant safety and the benefits resulting from such inspection. The reference to the industrial conditions of the period prior to 1908 recalls that the just demands of those employed in our industries have borne results.

Modern industry realizes that the human being, so necessary to the proper conduct of industry, is entitled to healthful and safe conditions in the pursuit of his daily labor. In the old order of things in industry, the workers carried all of the burden resulting from unhealthful or unsafe conditions in industry in addition to the physical suffering and handicap incident thereto. While in the new order of things the worker still suffers the pain and physical handicap of industrial injury, industry has made amends and to a degree is paying a portion of the loss suffered by those injured in our industrial pursuits. Those of us who can recall industrial conditions exist-

ing 25 years ago have seen the transformation, and in the light of what has happened the end is not yet.

The progressive leaders of our industries realize the injustice of the old order of things and with the changed condition they know that industrial injuries as they exist to-day are in a large measure preventable. This being so, industrial injuries are a tremendous financial loss and in addition inflict unnecessary physical suffering and handicaps on industrial workers who at best are not adequately compensated for such injuries.

These changes have taken place at a time when science and industry have made greater progress than in any like period in the history of the world. People are prone to call this the "machine age" because more work is done by the use of machines and power than at any other time.

The influence of inspection has done much to make machinery safe, or at least safer than it would be if it were not for the watchfulness of the trained inspector. The proof of this is indicated in the records of most of the States. It shows a reduction, or at least no increase, in the number of injuries resulting from machinery or mechanical apparatus, while the number of injuries from other causes shows an increase.

Inspection of industrial plants has improved conditions to a high degree, but inspection alone will not accomplish all that should be done. Inspection without adequate legislative regulation to protect employees is useless in a large number of establishments.

There is a fair percentage of employers who willingly do that which will make the industry safe and healthful for those employed. While proper regulation and inspection will do much to minimize the hazards of industry, it will take time to bring the average legislature to a realization of what the hazards of industry mean. When the legislatures are abreast of the time and in sympathy with the problem we can make greater progress. Legislative regulations or code rules should be based on industrial experience and should not require more than is necessary to provide a safe or healthful condition. Little will be accomplished unless the inspection is properly made by inspectors with industrial knowledge and who are capable and willing to enforce the legal regulations.

Regardless of how comprehensive are the legislative regulations or code rules, or how capable or efficient is the inspection by State officials or insurance companies, it can never be as frequent as necessary. Responsibility for conducting industry in a safe and healthful manner so as to prevent avoidable industrial injuries is with the industry. This may mean constant vigilance, nevertheless the responsibility rests squarely on the shoulders of industrial management.

What is needed in addition to proper regulation and inspection is an awakening of the industrial conscience to the point that industrial management will consider such management incompetent if injuries occur which are preventable.

If industrial management will make a study of the injuries accruing, it will be learned that machinery is responsible for a small portion of the injuries occurring generally in industry. It will be seen

that handling of objects and tools, falls of workers, falling objects, etc., far outnumber the injuries caused by machinery and apparatus. If we hope to make real progress in reducing injuries, attention must be given to teaching the proper technique of handling objects and tools, in addition to performing labor properly. Employees in many lines of work must learn the method of lifting and balancing the body. In fact, to prevent the large number of falls in industry, it is necessary to teach the industrial worker how to keep on his feet.

There is much to be accomplished before we can see industrial injuries diminished. It is a fruitful field for intelligent direction and it challenges industrial management.

Chairman MORLEY. I will now ask Mr. Thomas P. Kearns, superintendent of industrial hygiene of the Department of Industrial Relations of Ohio, to present his paper on Why the State Should Promote Safety Education.

Why the State Should Promote Safety Education

By THOMAS P. KEARNS, *superintendent division of safety and hygiene, Department of Industrial Relations of Ohio*

In assigning the topic "Why the State should promote safety education," the framers of this program evidently assumed that there was no room for discussion on the question of the State's responsibility in the matter. It is apparently taken for granted that the State should promote safety education and information is sought as to *why* it should.

The first duty of government is to safeguard the lives and property of its citizens and to promote their happiness and prosperity. The State that attempts to fulfill these obligations can not consistently ignore the problem of safety. As long as industrial mishaps levy their annual tribute of thousands of lives, hundreds of thousands broken and maimed, and millions of dollars in wage losses and retarded production, the State that neglects education of its workers along safety lines is not living up to the fundamental principles of government.

Safety education as a means of preventing accidents is an industrial theory of comparatively recent origin, but it is fundamentally sound. It has long since passed the experimental stage and is to-day one of the most potent influences in the industrial life of America. Education along safety lines applied to industry has increased production and profits. It has saved untold misery, greatly lessened the burdens of dependency, established higher standards of living and strengthened the morale of American workmen.

For many years after the inception of the safety idea, the entire accident-prevention activities of many States were confined to arbitrary enforcement of mandatory laws and other regulations or requirements governing industrial conditions through the exercise of police powers in the hands of State inspectors. As a matter of fact, this is the principal method used in most States to-day and in some the only method. Factory inspection, and the exercise of its attendant enforcement authority, has without doubt served a very useful purpose. It has been the means of eliminating innumerable hazards from industry, thereby preventing many accidents and injuries, and

the inspection departments, often working under severe handicaps, are to be highly complimented on the splendid results accomplished in this direction.

While I am thoroughly convinced that the educational phase of accident-prevention work is the prime factor in the ultimate solution of the problem, I say unhesitatingly and without reservation that I am not in sympathy with the attitude of those who claim that 90 per cent or 95 per cent of all accidents can be prevented through educational methods alone. In other words, I think that the installation of safeguards is not only desirable but essential to the success of any safety program; first, because an open gear or an unguarded belt or flywheel is a constant menace to every workman regardless of how well trained or careful he may be, due to human fallibility; and second, because, in my opinion, it is impossible to secure the cooperation or support of the workers, so essential to the success of a safety program, unless and until the employer has tangibly demonstrated his interest in the protection and welfare of his employees by spending whatever sums may be necessary to eliminate all physical hazards in so far as it is practicable, through the installation of mechanical safety appliances. Since there are, and perhaps always will be, some employers who must be compelled to provide safe working conditions in their plants through the exercise of the police powers of the State, it would appear that, regardless of the educational safety work carried on, so-called factory inspection must go on and factory inspection departments will have to continue to share responsibility for industrial safety with the educational agencies of the safety movement.

I know every safety engineer will agree with me that mechanical safeguarding done under compulsion does not fulfill its mission in safety engineering. Mechanical guards do prevent many accidents and I do not subscribe to the rather prevalent but fallacious opinion that we have passed the need of guarding, or attained to a complement of guarding. Far from it; nor will we ever attain to that ideal state so long as the ingenuity of man continues to produce more and more intricate labor-saving machinery in all branches of industry. Go out into your farming districts to any farm where mechanical agricultural implements are in use, look over the machines in the construction industry, and you'll find the simplest and most fundamental rules of guarding ignored because there has been no standardization of safety rules or codes governing these kinds of machines and little legislation to compel adequate guarding of them. And it is not in agricultural or construction operations alone that we find negligible guarding.

I am not unmindful of the guarding which has been done by many establishments for the protection of the workers, but there are yet many plants with little, if any, adequate guarding. In fact there are few plants in our State in which we could not find unguarded hazards and I venture to say this is true of every other industrial State.

Therefore, we need first the legislation and second the administration, for mechanical guarding is vital in accident prevention. Mechanical guarding is the first step in a safety program, but there can be no safety program worthy of the name unless the mechanical guards are installed by the management with the sincere purpose of pro-

protecting its employees from injury and as an earnest of its intention to prosecute a continuous, consistent, and vigorous campaign against accidents in its plant.

We have gone thus far on the road of safety progress. We have learned many things—that the cost of accidents can be standardized, and that the number of accidents can be reduced by mechanical devices—but we have also learned that these are not all, that we have barely stemmed the surging tide of industrial accidents, and that other and new measures and agencies must be employed.

* If managers could only know (as those of us who are devoting ourselves to the mission of safety know) what safety holds in store for them, and its economic relation to production cost in reduced insurance premiums, stabilization of the working force and the morale in the plant, and if the workers could be brought to a more general realization of the peace of mind that comes to a safe worker from steady employment unbroken by time lost because of injuries and from the resulting full pay envelope, then we would have the intended sequence of the existing legislation. But since the managers and workers do not realize these things, it becomes a matter of education. Safety engineering enters the realm of human engineering, for teaching is human engineering. The teacher must study his pupil, learn his peculiarities, and plan his method of approach, how best to interest and convince. In safety education I believe a study of human nature is especially essential to the awakening of the safety interest and the enlistment of cooperation.

You will appreciate that these comments have reference to the mass of industrial plants, which are mostly medium sized or small but which are in the large majority and are those for which our accident statistics show as a group a poor experience, and not to the large firms which have long since adopted safety as an operating policy. The management of the latter, we can safely assume, has learned what the former should know, and there the safety engineer is carrying on the education of the working force. His duty is to his own organization and he can not be expected to give much attention to the broader field. The National Safety Council, with its wonderfully efficient organization, its congresses and regional conferences, its contacts and ramifications, and its publication of masses of pertinent literature, is doing a great work in promoting safety. The engineering staffs of the casualty insurance companies are doing intensive educational work. The International Association of Industrial Accident Boards and Commissions and the Association of Governmental Officials in Industry of the United States and Canada take constructive action on the subject of industrial safety in their deliberations. Other agencies are in evidence in the great American safety movement.

Notwithstanding these, the field is not covered. Those whom we need most to reach do not attend safety congresses, do not get safety literature nor safety service, and it remains for the State to intervene and provide the means for the next advance in industrial-accident prevention. Just how the State should conduct this activity and just what particular machinery should be set up for it must be determined by the existing conditions, such as the disposition of its maintenance, the amount of appropriation for it, and the department to which it is assigned.

In any case it should provide for personal contact with management and, through management, with the workers. This should be done by men with experience in safety work which will enable them to present safety arguments and combat objections and with ability to persuade and convert. It is a selling proposition, and the State representative in this safety educational field must be both a teacher and a salesman; he must not only know his line as a salesman must know his line but also have the faculty to impart what he knows to others. From the selling angle, the greatest possible publicity should be given to this State agency, just as a merchant advertises his wares, for the purpose of arousing the interest of employers in the service that the State is offering them. I say the employers, for despite some belief and doctrine that the safety education must be directed to the workers and that safety literature, posters, calendars, and the like are prepared with that objective, I maintain that the employer must be educated first; not merely interested to the point that he displays posters, permits the holding of safety meetings, and carries out other suggestions for safety, perhaps even to having safety committees, but educated to a realization of the business value of safety, fully converted, and committed to safety as a vital factor in the conduct of his business. When he has guarded his plant mechanically, when he requires his foreman to observe safety, when he meets with his safety committee, when he himself addresses his employees at the safety meetings, when he reviews and watches his accident records and reports just as closely as he does those of production, then, and not till then, will the employer be safety wise, safety educated. We talk of the safe worker, we are stressing the responsibility of the foreman, but given the safe employer, all the rest will come. He will see to it that his foremen teach and practice safety; he will judge them by their accident records as by their production records; and he will invite and exact the cooperation of his employees. He will have recourse to his State safety bureau to assist him with its facilities for training his foremen in safety and inculcating his employees with the spirit of safety.

The spirit of safety in a plant is all embracing in its significance and import. It means a meeting of employer and employee on the common ground of mutual benefit. Each is sensible to his part in its enactment. The boss sets the example and provides the protection and supervision, and the workers are alert to the dangers, avoid taking chances, use guards and other protective measures, observe rules, and endeavor at all times to work safely and avoid accidents to themselves and their fellow workers. I can conceive of no more important service a State can render to its citizenry than to have a part in bringing to fruition the spirit of safety in industry within its boundaries. In such a case every employer makes safety men of his employees. In the turnover, the transition of workers from one plant to another, there is no safety hazard in the new man, for they are all safety men. Accident costs are reduced and production costs lowered. The earning capacity of the worker is increased, with greater comforts for himself and family, and the whole economic structure of the State is strengthened in an incalculable measure.

Safety education in industry is a problem that is confronting every industrial State in the Union to-day. Their previous activities and those of other agencies have brought it to an issue, and the industrial

State which does not recognize and accept this added responsibility now that the time is ripe for it will be remiss in its obligation to its employing and employed interests.

And in this connection and at this time I wish to direct attention to what I consider a short-sighted policy on the part of many of our institutions of learning in failing to recognize the importance of making safety education a part of their engineering courses. While some technical experts graduated by our State-controlled colleges and universities are incorporating modern safety ideas into the intricate mechanical equipment of our mills and factories, they have become imbued with the business necessity of safety from experience in the field since graduation from school, and it is a lamentable fact that safety education along the lines of mechanical safeguarding is not acquired from any course included in the curriculum.

Since employers with vision are to-day demanding that machinery be properly safeguarded when it is built, it is surprising that our State institutions of learning are not required by the State to incorporate a course of safety for all technical students. In this respect, the higher institutions of learning are not keeping pace with the normal training classes in the grades and high schools, which are taking, in Ohio at least, a very active and practical interest in the safety features of modern mechanism, which should be, in logical sequence, strengthened and extended in the colleges and universities. The failure to extend the safety spirit inculcated in the formative period of youth very often results in the graduation of highly skilled technicians who are ultimately required to secure an essential safety education in the school of practical experience because the modern employer demands it as a part of any engineer's mental equipment.

There is, furthermore, the psychology in having it come from the teacher. "If our professors told us it must be right," and, on the other hand, "if this safety that I'm hearing about is of importance why didn't our professors, our teachers, tell us about it at school?"

I have tried to avoid outlining a particular detailed form of procedure to be followed by a State in the promotion of safety education under State supervision, because of the variations in the forms of governmental administration, but I do want to tell you briefly of what has been done in Ohio and I fancy this was a reason for my invitation to speak to you.

The division of safety and hygiene was created and began its work in July, 1925, over five years ago, and in that period we have perpetuated what may have first been looked upon as an experiment. It is supported and maintained by an appropriation from the State insurance fund, made by legislation, agreed upon by representatives of employers and of organized labor, and its services are rendered without further charge. It is directly under and responsible to the industrial commission, which body makes all appointments, and I say with much pride that efficiency has been the only factor in the selection and appointment of the whole staff of the division. It has been functioning up to this time with a staff of 9 safety engineers, including men with technical training as structural, mechanical, and electrical engineers; 7 special investigators selected from the building trades, machinists, and steel-mill operations; a medical director; an editor of publications; a statistical laboratory employing 12 persons;

a clerical force of 4 or 5. All are under the supervision and direction of a superintendent and an assistant.

The engineers are assigned to and reside in the industrial centers. They make exhaustive physical surveys of plants and submit recommendations, offer their services in safety organizations, safety committees, meetings with foremen and workers, adoption of accident records, and any other measures to promote plant safety. They also urge and assist in planning and conducting community safety campaigns and address luncheon clubs and other organizations. In short, they improve every opportunity and follow every avenue to advance the cause of safety.

The special investigators are also resident in their territories and apply their efforts to the industries of their own trades and collaborate with the engineers.

The medical director acts in a consulting capacity with the employers, especially in matters bearing on the hazards of the compensable occupational diseases, and conducts research work on health hazards.

The position of editor of publications has proved to be an important one in the preparation of safety literature, the publishing of a monthly magazine, frequent circularization of the employers, and in enlisting the cooperation of the press to keep the subject of safety before the public.

All of these activities are dependent on the statistical laboratory for information to direct the work intelligently and effectively. All accident reports are filed with the industrial commission and are coded and recorded by our statisticians. There are complete statistics, in minute detail, of all industrial accidents in the State since January 1, 1926.

The division of safety and hygiene has no police power, no authority to order compliance with the State laws. It acts in a purely consulting capacity and we like to feel that we are in the same relation to the employer as a private service bureau. I believe we get better cooperation by this method. Among the thousands of visits that have been made I have knowledge of only a few isolated cases in which the employer rejected our services when offered.

In urging safety education by the State I do not want to be misunderstood as deprecating the necessity of continuing the State inspection. It is perhaps even more important that it be pursued with equal vigilance. It must go hand in hand with inspection, for it has an ever-present salutary effect and affords a background for the other. I doubt if in all cases our recommendations would receive the attention and execution they do were it not that they relate largely to the observance of the laws. I do believe that the employer responds with better grace and with a more kindly disposition to recommendations given in the way of advice in his interest than to orders for the same things just because, as he feels, it is the law. It is the choice between persuasion and coercion; the one is more palatable than the other. I am satisfied that with persuasion we succeed in getting many improved conditions not required by any State codes but nevertheless important to both employer and employee, from the standpoint of protection to life, limb, and property. I feel that our experience in this educational field has demonstrated beyond a doubt the value of

supplementing authority with persuasive, logical reasoning in attaining the end for which we are all laboring—the elimination of preventable industrial accidents.

In conclusion I want to reiterate that the part of the State in this great movement of safety is second in importance to no other jurisdictional duty, involving as it does the protection of the life and health of its workers, those without whom industry must cease and the State structure crumble to its foundations. I may not live to see it, but the day is surely coming, and I hope that there are those here to-day who will survive to the time when every one of our industrial States will have established the triumvirate of State supervision of industrial safety—compensation, inspection, and education.

I shall be content if what I have offered you may have some bearing on the advancement of safety by the State.

DISCUSSION

Chairman MORLEY. Mr. Wilcox, we understand that you are going to present the discussion of Mr. R. McA. Keown, of the Industrial Commission of Wisconsin. We are sorry that Mr. Keown is not able to be here, and we appreciate your presenting his discussion.

[Mr. Wilcox read Mr. Keown's discussion, as follows:]

Mr. KEOWN (Wisconsin). The writer has been much interested in reading Mr. Kearns' excellent paper. It would seem that a State would be compelled to promote safety education if much in the way of general results are to be accomplished.

Insurance companies do not give this service to others than their policyholders and in some cases where the plant is a small one, or where the insurance carrier has a small amount of business in the territory, the policyholder gets very little service.

Insurance inspectors can make recommendations for improvements, but if the plant owner does not take kindly to such suggestions, there is nothing for the insurance company to do but cancel the policy. This is not often done.

The larger plants generally have in their employ persons whose business it is to promote accident prevention. Such plants can keep abreast of the times in this work, but the small-plant owner usually is not awake to the opportunities that accident-prevention activities present for increasing the efficiency of the plant.

Only last week the writer accompanied a department deputy to a shop owned by a contractor and builder. The purpose of the visit was to convince the owner that he ought to guard a dozen or more woodworking machines before a serious accident occurred. The deputy, after a number of visits, had been unable to get results from this man because he considered all suggestions regarding safety as implications that he did not know how to run his business. In the course of the conversation, in which he expressed his opinion of inspections and inspectors, he stated that the fire insurance company had raised his rate, so he had canceled his insurance and now carried none. This owner will eventually guard all of his machinery, and then the fact that he is providing guards will have a good effect on others in the community.

In Wisconsin, where there are many plants that are self-insured, insurance inspectors do not make visits, so there is no outside agency to assist in accident-prevention work unless the State does. It is our experience that an inspector sees many hazards that are overlooked by persons constantly in the plant. Usually suggestions made by him are taken kindly.

The department with which I have the privilege of being associated is one that has police power. It has always been our aim, however, to keep force in the background and only to use it as a last resort after the employer has been given every opportunity to cooperate. Our deputies do not make plant visits in the rôle of policemen, but rather as safety advisers. They can not of their own volition exercise any police power, but instead make a complete report to headquarters and the commission takes whatever action it deems necessary.

In general the deputies of the department are welcomed to the plants, and in many instances the manager or superintendent has a number of matters that he wishes to discuss with the deputy.

One reason perhaps for some success in getting compliance with regulations is that in most instances the requirements are not made by legislative enactment.

It has always been the policy of the commission when promulgating orders to make use of advisory committees, the personnel of which is composed of employer, employee, and State representatives, who agree upon the standards reasonably necessary to attain the end sought. If in any particular case enforcement of the regulations would be unreasonable, the requirement can be modified, which would not in general be the case if the regulation were statutory. Because of this method of making regulations the administration of them is made much easier.

Mr. Kearns states that mechanical guarding is necessary in any safety program. It seems to me that only by putting the plant in the best physical condition as to accident hazards can the owner demonstrate his sincerity in the safety movement.

The problem of educating management in accident prevention is more important than educating the worker. When this is accomplished the accidents in any particular plant decrease. It is useless to expect the workmen to have a very high regard for accident prevention if the plant in which they spend their working hours is lax in this respect. If management does take an interest in the elimination of accident hazards and exercise some degree of discipline as to the use of safety devices and unsafe practices, results will always be obtained. Recently the president of a large box factory that has experienced a fine accident record stated that he was convinced that management could get about any kind of safety that was desired.

For several years the Wisconsin State Board of Vocational Education, through its local vocational schools, and the industrial commission have been cooperating with local industries in holding weekly or semimonthly safety schools for a period of two months during the winter. Plans are now under way for holding schools in 25 cities during the coming season. We feel that this is an important work, and if the State had not undertaken it, it probably would

not have been done, for the hardest part of the job is to get employers interested the first time.

Creating interest in accident prevention in engineering colleges has been a discouraging proposition. For several years the National Safety Council has had a committee the function of which has been to contact with engineering college heads. As near as can be ascertained there are as yet but six colleges giving special courses in accident prevention. Individual professors, however, in about 25 colleges are incorporating accident-prevention material in their existing courses.

There is no question in my mind that if engineering students were given instruction as to the seriousness of the accident problem, and if the shops and laboratories in which they work were put in even as good condition as the average industrial plant, a long step would be taken toward promoting accident prevention in industry.

Chairman MORLEY. We are going to hear next from the secretary-manager of the Newark Safety Council, Newark, N. J., Fred M. Rosseland, who will follow up the discussion on *Why the State Should Promote Safety Education.*

Mr. ROSSELAND (New Jersey). The presentation of this subject by Mr. Kearns struck me at once as being not only decidedly informative but really quite conclusive in proving his case, and I should think that the remarkable work of his department in the Ohio State government is further evidence. I am sure that I need not call your attention to the fact, therefore, that it is very likely that I shall inadvertently repeat some of the points and arguments used by Mr. Kearns and others.

In the first place, it seems to me that it is significant that apparently we have taken it for granted that the State has a responsibility and that that very fact is the answer to the "why" in our question. And I think that the reason that the responsibility of the State in this State has not earlier been recognized is due to the fact that from the very early days of industrial safety up to the present time the compensation side has been stressed to the almost complete exclusion of any other angles. And as the compensation is paid by the employer—directly or through the insurance company—we have thought of the responsibility of the State as being principally to insure prompt and equitable compensation payments as specified under the laws of the State involved.

Since the tremendous impetus given to industrial safety engineering by the passage of the compensation laws 18 or 20 years ago, we have learned very definitely that a very large majority of industrial accidents are preventable, and that the prevention of industrial accidents on an organized basis requires the application of the now well-known "three E's," viz: First, engineering (in its simplest form generally known as mechanical safeguarding); second, enforcement (in so far as workers are concerned and by the State in so far as employers are concerned); and third, safety education. And it has been established pretty conclusively that each of these three divisions has approximately an equal responsibility. But, fundamentally, safety education actually carries the greatest share of the load of responsibility for accident prevention, for it includes not merely the

safety education of workers but the safety education of supervisors concerning the State laws, safety codes, and similar requirements involved in the particular work they are engaged in; the safety education of employers concerning the necessity and value of accident prevention, State laws, safety codes, and other safety requirements and, specifically, the part which the employer must take in accident prevention in his own plant; and the safety education of the general public because it is from its ranks that workers, supervisors, and employers come and because the nonindustrial part of the inhabitants of our States exercise a very strong and beneficent influence on the thoughts and habits of industrial folks.

With this really tremendous task of teaching safety to workers, supervisors, employers, and the general public before us, where can we turn but to the State? What other agency could reach these essential groups so efficiently and so economically? What other agency could possibly teach safety with the prestige of the State? Let us look at it from another angle. When we teach safety we are actually trying to teach people to do something which they are not doing, and accordingly we encounter a resistance which is really comparable to sales resistance so commonly talked about by intelligent salesmen. Then, too, safety educational work in industry may involve requiring employers to go to some expense in changing equipment or methods or purchasing new equipment, and very likely employers, supervisors, and workers will feel that safety education will result in lessening production and hence smaller profits and smaller salaries and wages. Those of us who have been in this work for any length of time know that safety engineering actually results in increased efficiency, lowered operating cost, and actually higher incomes to supervisors and workers because of the increased production, fewer lost-time losses, etc. But the general public and its subdivisions already enumerated do not know this, and hence the State is especially effective in promoting safety education because in its hands lies the development and enforcement of safety laws and regulations, and because it can and should maintain a high-grade safety engineering department. Thus with one hand its safety educational work is checked up by police powers and with the other hand by technical and practical safety engineering data. In other words, the State actually has within its power the aid of the other two E's—engineering and enforcement. What other group can supplement safety education with both enforcement and engineering?

And continuing the assumption of the State responsibility for the promotion of safety education, what other agency can so naturally, easily, and economically do the job? What other agency can so equitably divide the cost? For it must be recognized that safety education is a very real and practical undertaking involving the expenditure of considerable sums of money—sums varying with the program undertaken and the number of persons involved. And inasmuch as accidents are an economic loss to the State and all of its people, what is more reasonable than to have safety educational work as well as policing and engineering costs included in the State budget and paid for out of the State income, thus spreading the burden as justly as we know how to do under our present taxing system.

It should be observed, however, that the methods to be used by the State in promoting safety education are not under discussion. But I should like to say a word about that, too, for it seems to me that the methods to be used are of fundamental importance. In the first place, I think that the promotion of safety education by the State should include safety education on a definite, consistent, and persistent basis, to the end that every employer in the State will ultimately be sold on the idea that it is just as important for him to operate his shop without accidents as it is to operate his shop at a profit. This would be done by the State through publications, addresses at public meetings, and personal interviews with employers, and, as indicated in the foregoing, the engineering departments and the police powers of the State should be used diplomatically in this part of the safety educational program. The other features of the safety educational program, however, may very well be conducted through or with the aid of existing agencies, such as local safety councils, the National Safety Council, chambers of commerce, employers' associations, neighborhood associations, and civic clubs through which both organizations and employers may be reached in groups. It should also be supplemented through the very definite use of safety posters. Safety posters of the National Safety Council and some of the great insurance companies, both so familiar to you, are fair and proper examples of what should be done. Such posters may properly be purchased by the State for distribution to the industries or may be produced independently by the State as the varying conditions may indicate. In addition to that, the safety educational department undoubtedly would carry on a continuous publicity campaign either with or through or independent of existing agencies and by means of the public press and the radio. Under existing industrial and general living conditions accident prevention is one of the most important activities in the civilized world, and we must utilize every opportunity and every agency and every penny which can be appropriated for the purpose to the end that lives and limbs may be saved and human life preserved for that great end for which the Almighty created it.

Chairman MORLEY. Our next paper is *The Cost of Industrial Accidents to the State, the Employer, and the Man*, and we have with us Mr. H. W. Heinrich, of the Travelers Insurance Co., of Hartford, Conn.

Cost of Industrial Accidents to the State, the Employer, and the Man

By H. W. HEINRICH, *assistant superintendent engineering and inspection division, Travelers Insurance Co.*

The costs of industrial accidents, as determined by any accepted method of calculation, are so high that careful consideration of the reasons for the occurrence of such accidents, and of ways and means to reduce them, becomes a responsibility not only of industry but likewise of all branches of society that are concerned. This includes the employer, and likewise the ultimate consumer or the general public, who in the last analysis must bear the whole cost of

industrial activities. It includes the insurance companies whose program, based as it must be upon their ability to project past experience into rates for future use, is dependent upon conditions that are measurable and under a reasonable degree of control. Federal, State, and municipal legislative, executive, and advisory bodies, and labor unions, are also directly concerned. In short, the cost of industrial accidents places upon society in general a tremendous burden of responsibility, which is exceeded only by the concurrent responsibility for loss of life and limb due to the same cause.

The limitation of this present discussion to accident cost alone needs no apology or defense. The moral and humanitarian obligations that are involved in accident prevention are thoroughly appreciated, and a sufficiently complete understanding of them by the employer and the employee may be taken for granted. If a fuller appreciation of accident costs proves to be a sufficient incentive to lead to additional efforts to reduce accident frequency, the objective of this present discussion of costs will be achieved.

Compensation Payments Do Not Represent Whole of Accident Cost

There are two kinds of accident costs—direct and indirect. Direct cost comprises expenditures incurred in consequence of claims under the provisions of compensation laws, and of the medical aid required by law. Together these items amount to about \$312,000,000 annually for the United States. This estimate, however, does not include cost data for States where there is no compensation law, nor for claims and medical costs arising under *liability* laws in compensation States, nor for the millions of minor-injury accidents and no-injury accidents for which no compensation is required by law, but which nevertheless create expense.

The number of industrial fatalities in the United States is estimated to be 25,000 annually, and the number of all lost-time injuries, including the fatalities, 3,000,000. From data compiled by Travelers Insurance Co. engineers it is concluded that approximately 29 minor injuries occur for each serious injury. The number of minor injuries therefore is something like 87,000,000 per annum.

In addition to these major and minor injuries there are many other accidents which result in no injury whatever, but which create considerable cost. Reference is made here not to mere errors, as that word is usually interpreted, but to actual narrow escapes from injury, as when an employee slips and falls from a ladder but fortunately sustains no bodily harm. There can be no question about such an occurrence constituting a true accident. In considering only such types of no-injury accidents, research shows that there are 300 of these for each major injury (i. e., one of the kind ordinarily reported to compensation commissioners or to insurance companies as a fatality or a compensable accident), or an annual total of some 900,000,000.

The direct cost of no-injury accidents may be negligible, but the indirect cost, although it can not be calculated accurately, is nevertheless a substantial part of the huge over-all industrial accident cost.

Travelers' engineers estimate the indirect or hidden cost of all industrial accidents to be *four times* as great as the compensation and medical payments. Expressed in another way, compensation

payments constitute only one-fifth of the total employer accident cost. This estimate is based upon careful and conscientious research, which now includes no less than 10,000 cases taken at random from claim files. Its accuracy has been demonstrated by application to scores of specific plants.

The 4 to 1 proportion does not necessarily hold true with regard to any one industrial accident, nor for any one individual plant, and it is granted that in nation-wide application the ratio may vary; yet it has already been tested sufficiently to provide approximate confirmation of the facts.

Accidents Cost More Than Five Billion Dollars Annually

An approximation to the total cost of the industrial accidents (of all kinds) that occur annually in the United States may be reached as follows, on the assumption that the "hidden costs" are four times as great, on the average, as the visible and recognized ones.

From data available at the Bureau of Labor Statistics, Department of Labor, Washington, D. C., it is estimated that the total amount of compensation paid to injured workers is \$240,000,000 per year, not including an additional \$72,000,000 paid for hospital treatment and medical aid. This constitutes a total of \$312,000,000 incurred because of 2,107,000 injuries to 19,683,500 workers. From these data the direct cost under compensation of a single injury is estimated to be \$148. To this should be added the legal and administrative costs required in the distribution of the benefits to the injured workers, such as are ordinarily paid in the form of compensation insurance premium by the employer to his insurance carrier. The total direct cost of an average injury is thus increased to \$246. With these data as nuclei and with the assumption that injuries not subject to compensation laws entail losses that may be estimated in the same way, the following cost table has been prepared:

Estimated annual direct, hidden, and total cost of industrial accidents in the United States

Nature of accidents	Direct cost	Hidden cost	Total
3,000,000 compensable injuries, at \$246 each, including 25,000 fatalities.....	\$738,000,000	\$2,952,000,000	\$3,690,000,000
87,000,000 minor injuries, at \$2 each.....	174,000,000	696,000,000	870,000,000
900,000,000 no-injury accidents at \$0.50 each.....		450,000,000	450,000,000
Total annual cost.....			5,010,000,000

At this point it may be of interest to give a résumé of an explanatory article, dealing with the 4 to 1 ratio of hidden costs to recognized ones, which appeared in *The Travelers Standard* for November, 1927.

Factors in the hidden cost to employers, of injuries to employees

[Excluding compensation and liability claims; excluding medical and hospital cost; excluding insurance premiums; and excluding cost of lost time, except when such cost is actually paid by the employer without reimbursement.]

1. Cost of lost time of injured employee.
2. Cost of time lost by other employees who stop work—
 - (a) Out of curiosity;
 - (b) Out of sympathy;
 - (c) To assist injured employee; or
 - (d) For other reasons.

3. Cost of time lost by foremen, supervisors, or other executives, as follows:
 - (a) Assisting injured employee;
 - (b) Investigating the cause of the accident;
 - (c) Arranging for the injured employee's production to be continued by some other employee;
 - (d) Selecting, training, or breaking in a new employee to replace the injured employee; and
 - (e) Preparing State accident reports, or attending hearings before industrial commissioners.
4. Cost of time spent on the case by first-aid attendant and hospital department staff, when this time is not compensated by insurance.
5. Cost due to injury to the machine, tools, or other property, or to the spoilage of material.
6. Cost due to interference with production, failure to fill orders on time, loss of bonuses, payment of forfeits, and other similar causes.
7. Cost under employee welfare and benefit systems.
8. Cost in continuing the wages of the injured employee in full, after his return—even though the services of the employee (who is not yet fully recovered) may for a time be worth only about half of their normal value.
9. Cost due to the loss of profit on the injured employee's productivity, and on idle machines.
10. Cost of subsequent injuries that occur in consequence of the excitement or weakened morale due to the original accident.
11. Overhead cost—the expense of light, heat, rent, and other such items—which continues while the injured employee is a nonproducer.

This list does not include all of the points that might well receive consideration, although it clearly outlines the vicious and seemingly endless cycle of events that follow in the train of accidents.

The application of this set of factors to specific cases is illustrated by the following typical examples, taken from actual experience.

Example No. 1

Total cost of compensation and medical aid..... \$209
 Total additional cost, paid directly by the employer..... 937

The following accidents occurred in a building-erection job:

Number of accidents	Type of injury	Cause	Compensation and medical cost
3	Fractures and contusions.....	Material hoist.....	\$106
18	Rivet burns, cuts, bruises.....	Miscellaneous operations.....	76
21	Falling materials.....	do.....	15
30	Slips and falls.....	do.....	12

The hidden cost was computed as follows:

Time lost by injured employees, paid directly by the employer..... \$116
 Time lost by other employees in consequence of accidents... 310
 Time lost by foremen and superintendent as a result of the accidents..... 78
 Property damage..... 158
 Payment of forfeits (2 days) for failure to complete the job on time..... 200
 Portion of overhead cost loss during delay due to accidents... 75

An interesting point developed by this analysis is indicated by the relatively high cost to the employer, on account of the time lost by employees other than those who were injured. This was due chiefly to one of the material-hoist accidents. Shaftway inclosures were

not maintained, as good practice demanded, and one employee, who was working in the vicinity of the hoist, was injured when he carelessly allowed a heavy plank to project into the path of the ascending car. The hoisting cables were torn from their fastenings, permitting the car to drop. Labor on the upper tiers was necessarily suspended pending the completion of the consequent repairs.

Another feature worthy of note is the loss due to forfeits. The contractor himself estimates that delays caused by the accidents interfered with the completion of the job at the time agreed upon, thereby penalizing him to the extent of \$200.

Example No. 2

Total cost of compensation and medical aid..... \$66
Total additional cost, paid directly by the employer..... 275

This example was obtained from the records of a certain hardware-manufacturing plant, and covers an experience of six months.

The following accidents occurred:

Number of accidents	Type of injury	Cause	Compensation and medical cost
1	Lost nail of index finger.....	Punch press.....	\$61.50
1	Lacerated forearm.....	Baling press.....	4.50
9	Cuts on hands.....	Handling sheared metal.....	.00
10	Slips and falls—dropping objects.....	Miscellaneous operations.....	.00

The hidden cost was computed as follows:

Value of labor and material in connection with canceled order. \$107
Time lost by injured employees (paid by employer)..... 36
Time lost by other employees in consequence of the accidents 34
Cost of repairs to stamping dies..... 33
Unearned wages (the employer paid a slightly injured skilled employee 10 days' full wages—\$6.30 per day—receiving in return unskilled labor worth \$2.50 per day)..... 38
Time lost by foremen and superintendent as a result of the accidents..... 27

The visible direct cost in this example lay in the relatively infrequent serious accidents, while close analysis shows that a large part of the hidden cost was due to the trivial injuries.

One of the injuries described on the employer's records as "Slips and falls—dropping objects" occurred to a toolmaker who, on account of laxity in supervision, was indulging in a bit of gossip while operating an engine lathe. His attention being temporarily diverted from his work, he allowed the lathe tool to feed into a shoulder of a jig that was mounted on the face plate of the lathe, tearing the work loose from the face-plate clamps and causing it to drop upon his fingers and jam them against the lathe bed. The jig (original value \$48) was ruined. Its cost has not been included, however, because the jig was merely being repaired for stock, and its actual value at the time of the accident was difficult to ascertain. What is of more interest is the fact that this skilled toolmaker was unable, on account of his bruised and bandaged fingers, to undertake the building of a set of blanking dies that were ordered the same day that the accident occurred. Another toolmaker was employed for that purpose, and

the injured man was transferred to work requiring less skill. Thus for a time the employer paid the wages of two skilled men and received in return little more than the labor of one.

The punch-press injury is also of interest from the viewpoint of incidental cost. Orders had been issued to the effect that the press-room foreman must be called in case stock became jammed in the dies. These orders were not rigidly enforced, and one of the press operators, observing that a blank had been pulled up by the punch so that it obstructed further feeding, tried to remove it with a metal rod and accidentally stepped on the clutch pedal at the same time. The dies were thrown out of alignment and seriously sheared, and at the same time the employee's finger was nipped under the spring stripper plate. The delay incidental to repairs in this case was sufficient to cause cancellation of the order on which the operator was working, thus creating a labor and material loss of \$107, according to the manufacturer's statement.

Example No. 3

Total cost of compensation and medical aid..... \$59
Total additional cost, paid directly by the employer..... 262

Following is the cost record of 36 injuries in an average woodworking plant manufacturing interior trim and doing some cabinetwork.

Number of accidents	Type of injury	Cause	Compensation and medical cost
1	Hand severely cut.....	Jointer.....	\$51.00
15	Cuts and bruises.....	Handling material.....	5.00
10	Slips and falls—falling objects.....	Miscellaneous operations.....	3.00
1	Finger slightly lacerated.....	Band saw.....	.00
1	Bruised forehead.....	Struck against machine.....	.00
8	Miscellaneous cuts and bruises.....	Hand tools.....	.00

The hidden cost was computed as follows:

Time lost by injured employees in consequence of accidents
(paid by the employer)..... \$48.00
Cost of time lost by other employees..... 116.00
Time lost by foremen and superintendents as a result of the
accidents..... 79.00
Spoilage of material..... 11.40
Broken and damaged tools..... 7.60

Here again a significant feature of the example is that the cost due to the time lost by employees other than those who were injured was greater than the cost of the time lost by the injured employees themselves. A part of this cost occurred because fellow workers crowded about in sympathy or curiosity or while giving assistance to the injured employees, but the major portion was due to the fact that a certain foreman, who for a period of one week was obliged to operate a production machine, was not readily available for consultation. The situation existed as a result of a preventable accident on a partially guarded jointer. That machine was being used at the time as a molder, and it was vital that production be continued. The foreman happened to be the only remaining available skilled operator. While he was engaged in running the jointer, considerable delay and confusion existed in his department. Employees in need

of instruction and advice were obliged to wait. Loss of production is not included in my estimate of incidental cost, but the lost time of uninjured employees in itself constitutes an item worthy of consideration.

Minor Accidents Cause Huge Losses

These examples include no fatalities, dismemberments, or permanent injuries. Such omission is deliberate and does not affect the ultimate ratio. To be sure, there are many fatalities which result in a direct cost of thousands of dollars, against a relatively small hidden cost. On the other hand there are just as many cases, or even more, where a minor accident costing but a few dollars in compensation or medical aid has caused an additional hidden loss of staggering proportions as illustrated by the following:

An employee of a steel-construction contractor, who was tending the guide rope while a huge steel girder was being hoisted, stumbled, bruised his shin, lost his grip on the rope, and allowed the girder to swing and strike against a column. The jar displaced the clamps, causing the girder to tilt, slip, and crash down upon a sidewalk shed, demolishing a section of scaffolding in its descent and damaging a hoisting engine seriously. The resultant property damage and delay cost the contractor several thousands of dollars in addition to the relatively slight medical cost of treating the employee's bruised leg.

Accident cost in the aggregate, as measured by compensation and medical payments, is made up of the greater volume of low-cost minor injuries, rather than the lesser volume of high-cost fatalities and serious injuries.

Were it fair to do so, an apparently stronger defense for this 4 to 1 ratio could be established by citing cases such as the following:

1. A premature quarry blast, set off inadvertently by an employee who became startled by a slight injury, resulted in serious damage to six drill rigs and a steam shovel. This equipment was buried under tons of rock and the total loss was over \$10,000.

2. The flooding of a tunnel occurred as the direct result of a minor injury. The loss amounted to over \$25,000.

3. A slight injury to a lineman caused him to drop a coil of wire, resulting in a short circuit. This led to claims against the power company, and a loss of several thousand dollars.

4. An injury to an engineer, who was adjusting the stuffing box of a large steam engine while the engine was in operation, caused him to drop a wrench into the path of the moving crosshead. The cylinder head was broken and the engine was thrown out of alignment and badly wrecked.

5. An explosion of a japanning oven (loss \$17,000) was the result of an error on the part of a workman whose attention was diverted by a minor accident.

The original estimate of the hidden costs that are here emphasized was published in December, 1926.²

From further research the following conclusions are drawn:

1. Recently acquired data show a tendency toward a still higher ratio of "incidental" cost to direct cost.

2. The hidden cost of noncompensable injuries is about one-half of the total direct cost of all compensable injuries. (These injuries are of a type not usually reported, either to State compensation boards or to insurance companies.)

² Heinrich, H. W.: "The incidental cost of accidents." *The Travelers Standard*, December, 1926. See also the Proceedings of the Tenth Annual Industrial Congress, New York State Department of Labor, pp. 244 to 257, inclusive; and *Manufacturing Industries* for January, 1927.

Analysis Required to Prevent Accidents

Although the present paper is not intended to discuss the prevention of accidents, it may not be out of place to say that prevention depends upon two essential elements:

1. Accident-cause analysis by a trained safety engineer.
2. The will, on the part of the employer, to take proper action.

The first of these essentials is readily available to-day; the second is in vital need of additional strength. The employer must be awakened. He must realize that the prevention of accidents is "good business." He must so indorse it—must give it his backing, and place it in his plant on a par with production and sales. To do this he needs a newer and stronger incentive than he has heretofore had, and the tremendous financial burden that he bears because of the hidden cost of accidents constitutes such an incentive.

The total direct and hidden costs of industrial accidents—including those previously described as no-injury accidents—in consideration of all pertinent factors, is a matter of billions of dollars annually.

Compensation Insurance Premium Measures Direct Accident Cost

The employer pays this cost out of his own pocket. Insurance acts as a loss shock absorber—a leveling device which smooths out the accident-cost curve and permits him to estimate his accident cost in advance of mishaps. The cost of insurance is chiefly an accident cost, and the burden must rest first of all upon the employer. How tremendous the burden is that the direct cost of accidents throws upon the employer is well portrayed by the compensation insurance rates that experience proves to be necessary. Expressed in the language of industry, these rates average 1.2 per cent of the entire pay roll, and in the case of certain classifications in specific localities they sometimes exceed 25 per cent of the pay roll.

All Accident Costs are Passed Along to the Individual

The employer charges this cost against operating expenses and passes it on to the consumer as a part of the price of his product or service. This is true, likewise, of the *hidden* costs of accidents. Thus it must be recognized that, to the physical suffering, deprivation, want, misery, and loss of wages borne by the individual, he must, because of the occurrence of industrial accidents, assume also all of the direct and hidden costs of the accidents in dollars which are first paid by the employer. Although these costs, in common with all other operating and manufacturing costs, are thus relayed to the general public, the employer is handicapped in his efforts to attain the ideal situation, which is generally that of small profit, large volume, and low-cost product.

The cost of industrial accidents thus passed along to the individual decreases the purchasing power of the dollar. It lowers the standard of living, reduces the consumption of manufactured product, and makes for hard times. Expressed definitely in terms that may impress the *salaried worker*, industrial accident cost represents a *tax of 11 per cent annually on his income*.

Accidents Cause Loss to the State as Well as to the Individual

The State suffers also. Increased accident frequency and increase in cost of severity entail greater legal, executive, and administrative State expenditures. In fact, the interests and progress of the State depend almost wholly upon the prosperity of its population. Even though the wealth of a nation may be said to lie in part in its natural resources, yet it is true that these are of value only as they are made use of through the intelligent work of an able-bodied population. The State therefore suffers from the cost of accidents in exact ratio to the sufferings and loss of its citizenry.

The cost of industrial accidents has been treated in this paper chiefly from a monetary point of view. The other phases of cost, however, that affect the injured employee and his dependents directly have a far from remote effect upon the employer and upon the State as well.

The occurrence of accidents in industry destroys morale and good will; it plays havoc with the prestige, reputation, and character of the industrial establishment; and in many other ways it entails a kind of cost that can not readily be measured in terms of dollars, but which is nevertheless a tangible fact.

Whatever may be the variations in accident-cost calculations, it is an admitted fact that these costs are burdensomely high. They should be reduced, and they can be reduced. A general awakening to a better realization of the facts is taking place. Accident prevention is establishing itself as an integral part of business management, and is rightfully being considered in discussions of national problems in general.

Industrial Accidents Can Be Reduced 50 Per Cent

A 50 per cent reduction in present accident frequency and cost can be accomplished readily and practicably and with little expense, when accident prevention is recognized as a science and when its fundamentals or principles are better understood and applied.

So far as the consideration of the cost of industrial accidents to the employer, to the State, and to the man, creates interest and serves as an incentive to action, it may well be considered an important factor in the accomplishment of a worth-while objective.

[Meeting adjourned.]

WEDNESDAY, SEPTEMBER 24—AFTERNOON SESSION

Chairman, John Roach, Deputy Commissioner of Labor of New Jersey

DISCUSSION

Chairman ROACH. The first part of the program will be a discussion on the Cost of Industrial Accidents to the State, the Employer, and the Man, by Mr. Joseph E. Plumstead, vice president of the Delaware Safety Council. Mr. Plumstead is not able to be here, and his remarks will be read by Mr. Walter Dent Smith, who is manager of the council.

[Mr. Smith then read Mr. Plumstead's discussion, as follows:]

MR. PLUMSTEAD. I believe I have the honor of being the only plant executive on the morning program. I am one of those persons who was discussed several times this morning as one who can walk all around a death trap and never see it. This actually happens, I may seriously add, and if one wishes to have the experience of an inferiority complex, he need only be a plant manager and have an ordinary industrial accident occur in his plant.

He may try to excuse the causes as entirely accidental, but if he thinks the thing over seriously, nine times out of ten he will realize that he has overlooked the cause of the accident many times when passing the spot where the accident occurred.

This is my first appearance before your organization. It is, however, the third time I have listened to Mr. Heinrich. Each time I have heard him speak I take away with me fresh inspiration for our industrial safety work.

We will all agree, I am sure, that Mr. Heinrich has presented us with statistics of unusually high informative value. Not only has he presented these statistics in an easily understandable way but the deductions drawn are interesting and impressive. I have been particularly impressed by the ratio of minor injuries to lost-time injuries and the ratio of lost-time injuries to fatalities.

A comparison of the figures of the Travelers Insurance Co. with the figures quoted by the Bureau of Labor Statistics shows that one industrial worker in every 787 is killed each year. One in every 6 has a lost-time accident, and every worker suffers almost 5 minor injuries each year.

From recent research which has been made in studying the accident-prone employee, would it not seem that a study of recurrent minor accidents to individual employees might be the logical approach to the solution of the problem?

In discussing the prevention of accidents, two essentials were brought out: (1) Accident-cause analysis by a trained safety engineer; and (2) the will on the part of the employer to take proper action.

Is not our greatest problem that of devising ways and means to assist to-day the younger and "more accident-conscious" executives in selling the "old-school" type of executive the idea of accident control and prevention? The young executive has a real job on his hands in the justification of expenditure of funds for accident prevention. Many times he must obtain the approval of a man who has been graduated from the school of hard knocks and who has stepped out of the sphere of personal observation and of personal contact with accidents and safety work.

How can such a young executive present his costs and other convincing statistics to his chief without the hiring of statisticians, a thing which he may be forbidden to do? Such cases probably exist by the thousand in the United States. How can we help our young executives to convince their chiefs of the crying need for money and action? Accident-cost information and publicity for each industry would seem to be the answer. Are there other more direct and effective methods of meeting this task? The State is interested and should require accident-cost returns for all accidents, whether lost time or minor, just as it requires tax returns.

The average employer may now feel disinterested because he does not know his indirect accident costs and does not dream of their magnitude, but let the State require that their costs be properly kept and we will not need further police duty from the State; the employer himself will make a rush to reduce his accidents when he realizes their full cost.

The average man probably does not realize the cost of industrial accidents either to him, to his employer, or to the State. But it is the duty of the State and of the employer to protect the man for both economic and humanitarian reasons and the sooner the State can bring the employer to a realization of the total cost of industrial accidents, the sooner another great step forward will be made toward safety in industry.

Chairman ROACH. The next speaker will be Dr. Leonard W. Hatch, a member of the Industrial Board of New York, who will discuss the paper by Mr. Heinrich on the cost of industrial accidents to the State, the employer, and the man.

Mr. HATCH (New York). I have just two comments to make on Mr. Heinrich's very impressive and enlightening paper on this subject. I am sure we are under obligation to Mr. Heinrich for coming here and giving us the benefit of what I know represents a great deal of engineering and practical research into the question. Mr. Heinrich's paper dealt with the money cost of accidents, particularly from the point of view of the employer and of society generally to whom the costs are passed on by the employer.

I would like to call attention to another item of money cost in accidents which is not always realized from the point of view of the injured man. A short time ago I had occasion to make some analysis of New York's experience in order to discover how far it actually did, under the compensation law of New York, shift a monetary loss suffered by the injured man from his shoulders to society at large.

Our compensation rate in the State of New York is two-thirds of average weekly wages as a basis, but, as in most States, there are several limitations in the way of maximum compensation rates; for

example, for a partial disability the maximum is \$20 a week; for a total disability it is \$25 a week.

In the building industry of New York City, for instance, wages for skilled mechanics particularly are around \$60 a week, and it is easy to see that a permanent partial disability which compensates him at the rate of only \$20 a week is not shifting two-thirds of the burden upon his shoulders; on the contrary, it is shifting one-third, and two-thirds of it still remains lost.

Following out that idea, the result I arrived at in New York (which I think was a fairly safe figure although it involved a good deal of estimate) was that probably for the country as a whole the amount of wage loss suffered by wage earners, due to accidents, which is not compensated is equal to the amount of wage compensation which he actually receives. So I imagine, if I understand Mr. Heinrich's estimate correctly, there would be a total monetary loss of some \$240,000,000 more to add to his figures.

I am not so much interested in the figure itself as in the fact that that is evidence that Mr. Heinrich has been on the conservative side. The figure is not an imaginary thing or something set up for the purpose of selling safety. It has the earmarks of a conservative estimate of what accidents are actually costing in money. So much for the first comment.

The second one is in the nature of a little flight of imagination as to what might happen if the States, with reference to State work in accident prevention, could be sufficiently impressed with figures such as Mr. Heinrich has given us to deal with the problem in a businesslike way—I am talking about New York figures only, because I am in a position to get some figures about our appropriations for safety work which I do not have for the other States.

Taking the figures of our last appropriation act I make what I believe is a safe estimate—and there is an element of estimate here because a number of the appropriations of the State for our bureaus are for bureaus not wholly concerned with accident-prevention work but which are concerned in accident-prevention work and other activities—that the State of New York expends now for accident-prevention work in its department of labor approximately \$500,000 a year—a half million dollars.

I have taken our actual compensation payments in New York as a basis and applied to that the proportions and estimates which Mr. Heinrich has made in a similar manner for the whole United States and the result indicates that in the State of New York the figure corresponding to the \$5,000,000,000 for the United States is probably somewhere around \$250,000,000. I am quite sure that that is on the conservative rather than the liberal side.

What the State is doing in New York in the way of endeavoring to prevent accidents is to spend \$500,000 a year, pecking away at a loss of \$250,000,000. I might say that in this discussion I am talking about the State because this is an organization of State officials, and I do not overlook the fact that other agencies—private agencies and organizations—are also spending a great deal of money, but this is a social problem and the State activity represents what society as a whole is doing practically about it.

Suppose that the State of New York, realizing this enormous waste, in either a spasm of sentiment about it or in a practical busi-

nesslike attitude, said, "Well, if it is worth while spending some money to cut down this waste, instead of \$500,000 we will appropriate \$5,000,000 for State activity to prevent industrial accidents." All of you men who have to deal with State legislatures, I think, will agree with me that that represents a considerable flight of fancy on my part, conceiving of a State legislature suddenly doing something of that kind, but suppose it did?

Let us further assume that the expenditure of 10 times as much for accident prevention in the State of New York would reduce accidents only 2 per cent. I submit that that certainly is within the realm of common sense and reason, what anyone might say about inefficiency in State work. I am simply assuming that the State of New York decides to spend ten times as much in safety work and the result is only 2 per cent reduction in accidents. What would be the financial break of the State on that proposition?

As I figure it out, the State is now expending \$500,000. I am assuming it would spend \$5,000,000, which would be an addition of \$4,500,000 to the State expense. If we saved 2 per cent of \$250,000,000, the saving would be \$5,000,000, so that on that proposition—spending 10 times as much for safety and in such a way that it would be efficient enough only to cut down the present accident total 2 per cent—the State would not only save its additional \$4,500,000 but would have \$500,000 over to cover all it is now expending for safety work.

It seems to me Mr. Heinrich has presented us with a very practical document to be used in connection with State appropriations for safety work. I have always felt that appeals to State legislatures for money for accident prevention were based too much upon sentimental arguments or offhand suggestions about the sufferings of workmen; that is reasonable enough, but it has been said so many times that it is not making the impression it should.

We know enough from such papers as Mr. Heinrich's and other studies to make it possible to go to the legislature and say, "This is not an appropriation to take more money out of the community with no return; this is simply an appropriation to spend more money in order to save still more money."

Chairman ROACH. The last paper of the morning session will be by Mr. Daniel Harrington, who will discuss Effect of Mechanization of the Coal-Mining Industry Upon the Frequency and Severity of Accidents.

Effect of Mechanization of the Coal-Mining Industry Upon the Frequency and Severity of Accidents

By DANIEL HARRINGTON, *chief engineer safety division, United States Bureau of Mines*

Inasmuch as nation-wide statistics as to nonfatal accidents in the coal-mining industry are not available, this discussion will be confined chiefly to the effect of mechanization on the occurrence of fatalities in the coal-mining industry of the United States; and in general a broad definition of mechanization will be used rather than the recently established meaning which restricts the term "mine mechanization" to merely the relatively newer coal loading and conveying machinery used at or near the faces.

The major operations of coal mines, such as ventilation and haulage, and to a less extent methods of loosening, or "bringing down," and loading the coal and timbering the workings, were to a large extent mechanized long before the present generation, though all of these operations, except possibly timbering, have been much more intensively mechanized within the present generation and more especially during the past decade.

While a relatively few coal mines still rely upon so-called "natural" ventilation, or possibly on the almost equally futile and unsafe ventilating furnace, our mines of to-day are for the most part ventilated by comparatively efficient types of mechanical fans, the most modern installations being electrically operated high-speed fans placed on the surface in fireproof housing and so located as either to force or to exhaust considerable quantities of air through the mine. There are comparatively few accidents caused directly by mechanically operated fans located on the surface; however, if the fans are placed underground they are a distinct hazard in coal mines and annually cause numbers of deaths (in some years around or over 100) due to fires or explosions or other accidents.

As regards haulage, practically all of our mines use cars handled by electric or possibly compressed-air locomotives or by hoists and ropes, though there are many relatively efficient mines where horses or mules haul all or at least a large part of the product. The haulage accident hazard in coal mines is serious, and is somewhat analogous to the traffic hazard on our streets and roads in town and city, due to the various haulage problems. Usually haulage accidents constitute about 17 per cent of the fatalities in the coal mines of the United States; the number thus killed was 3,894 for the 10 years 1918 to 1927, the number for 1928 being 361. It is readily seen that mechanization is responsible for essentially all of the haulage fatalities in and around our coal mines, and these fatal accidents from haulage number but little less than 400 per year. Bureau of Mines Bulletin No. 319, in discussing fatalities from haulage in coal mines, says: "Three hundred and sixty-one men were killed by haulage accidents underground in 1928, six more than the preceding year's total. The death rate per man employed was 9 per cent higher than in 1927 and was also higher than the rates for all but four of the past 18 years."

In the methods of "bringing down" or loosening the coal from its solid condition to allow of handling the coal in some manner, long strides have been made toward mechanization during this generation; instead of having the coal brought down largely by hand mining or by "shooting off the solid," as in past generations, nearly three-fourths (73.8 per cent in 1928) of our bituminous coal is now machine mined. This does not mean that three-fourths of our approximately 500,000,000 tons of bituminous coal produced annually is entirely brought down or loosened at the face by machinery; but it does mean that machines such as undercutting, overcutting, or shearing units (and in a few instances machines which do actually pull down the coal in form for transportation to the surface) are used to facilitate such bringing down or loosening of the coal in form for possible transportation to the surface. Most of this machinery used to bring down, or to aid in bringing down, the coal is electrically driven, and must be used at or near the faces or places

where by far the greatest amount of explosive gas or dust, or both, are found. In addition, this machinery requires the use of pipe lines or power lines or of other machinery underground, and these lines, especially the electric-power lines and other underground electrical machinery such as motor generator sets, rotary converters, etc., add materially to the accident occurrence in our mines. For the six years 1911 to 1916, the number of fatalities in bituminous mines per million machine days of operation of mining machines was 4.2; this increased to 6.0 for the six years 1917 to 1922 and to 8.0 for the six years 1923 to 1928. The trend would be very disquieting were it not for the fact that relatively few men are employed on the machines themselves, and that for the six years 1923 to 1928 the average number annually killed by mining machines in our mines was 27.3. However, the hazard due to mechanized methods used to bring down coal is by no means confined to mining machines; approximately 90 persons are now annually killed in our coal mines by coming in contact with electricity, and large numbers of these deaths (in some years over half) are due to electricity at or near mining machines. An even more serious hazard is that of explosions or fires caused by mining machines; our coal-mine explosions, which are now causing approximately 300 deaths annually, are being started chiefly (50 to 80 per cent in recent years) by electricity, and mining machines contribute their share of the ignitions.

Among the methods used to loosen the coal in the mine, blasting is very important, and in a wide interpretation of the term the entire operation of blasting might be considered a mechanized operation. But even if blasting as a whole should not be defined as a mechanized operation, the drilling of the holes for blasting in coal mines is done by machinery, sometimes operated by hand power, sometimes by electricity, and fairly frequently by compressed air. Electrically operated drills have caused fatalities by contacts with the current and have precipitated explosions by ignition of explosive gas by electric arcs or sparks. In addition, there were 10 fatalities in 1929 due to various occurrences connected with a new type of blasting by a mechanical method. Explosives or blasting now cause about 50 deaths annually in bituminous mines, and it is safe to estimate that at least 10 of the 50 are due to mechanical contrivances utilized in some manner with the blasting.

Before 1925 there was a relatively small amount of experimentation with mechanical contrivances designed to replace men shovelers to remove the coal from the faces after it had been loosened. Mechanized loading was given a definite increase, starting about 1925, when 6,148,000 tons out of 520,052,741 tons of bituminous coal produced were loaded at the faces wholly by machinery; this was further increased to 10,022,000 tons out of 573,366,985 tons in 1926, to 14,559,000 out of 576,093,039 tons in 1928, and to 19,291,000 out of 532,352,000 tons (estimated production) in 1929. These tonnages do not include amounts loaded where men shovel into loaders or conveyors, the amount thus loaded in 1929 being somewhat over 18,000,000 tons, giving a total loaded mechanically in 1929 of 37,862,000 tons as against 21, 559,000 tons in 1928.

The effect on accident occurrence due to these substitutions of machinery for man power in loading the coal at the face is now

much debated. The main safety arguments advanced by proponents of mechanization are that the machines greatly reduce the number of men needed for underground operations, hence there is automatically a decrease in the accident hazard; and that, moreover, the machines concentrate the work and allow of intensive supervision now conceded to be one of the most effective methods of bringing about safety. Against this reasoning is the fact that the introduction of merchanzed contrivances into the confined spaces usually available at coal-mine faces introduces definite hazards from contact with gears or with electricity; also where workers are massed around machines there is the danger of multiple accidents in case of fall of roof or of small gas or dust ignition, runaway cars, premature explosions in blasting, etc.

The process of substituting machinery for men in loading at the face has not become sufficiently widespread nor has it been in effect sufficiently long to afford enough data on which to base definite conclusions as to the relative safety of the old hand loading as compared to the newer mechanized loading methods. The fragmentary data at hand, however, tend to indicate that while possibly when installed and operated with reasonable safeguarding of the mine and its workers, the newer methods give good results in safety, on the other hand there seems to be a decided tendency to take it for granted that mechanized loading is automatically safe; hence safety is given little or no consideration in the installation or in the operation of these newer methods and there is much reason to believe that safety has been lessened rather than enhanced by them. This is indicated to a certain extent by the fact that the latest complete figures on death rates per million man-hours of exposure show that these rates have increased in the two most highly mechanized coal-mining States, Illinois and Wyoming, the increase in fatalities per million man-hours of exposure keeping pace essentially with increase in the use of mechanical loading devices, starting in 1925, as follows: The death rate per million man-hours of exposure in Illinois was 1.196 in 1925, 1.588 in 1926, 1.479 in 1927, and 1.742 in 1928; similar rates in Wyoming were 1.913 in 1925, 2.591 in 1926, 2.511 in 1927, and 3.014 in 1928. The figures for Illinois are to a certain extent corroborated or strengthened by the following tabulation published in the 1928 report of the State mine inspection department of Illinois:

Comparison of men employed, tons mined, average days worked, and accidents in Illinois, 1928, by methods of loading

Method of loading	Men employed	Average days worked	Total tons mined	Accidents		Tons mined per man		Ratio per 1,000 employed	
				Killed	Injured	Killed	Injured	Killed	Injured
Total loaded mechanically.....	1, 866	168	2, 299, 720	6	263	383, 287	8, 744	3. 2	140. 9
Part loaded mechanically.....	15, 848	174	15, 287, 362	34	1, 876	449, 628	8, 149	2. 1	118. 4
Hand loaded.....	42, 227	135	32, 453, 085	85	3, 590	381, 801	9, 040	2. 0	85. 0
Strip mines.....	1, 213	199	4, 244, 017	2	109	2, 122, 008	38, 936	1. 7	90. 0
Total.....	61, 154	150	54, 284, 184	127	5, 838	427, 434	9, 298	2. 1	95. 5

The preceding tabulation contains probably the most complete data available concerning the relative accident occurrence in coal mines entirely mechanized as to loading of coal as against partly mechanized mines or those dependent partly on hand and partly on mechanized loading. It will be noticed that the mines wholly on mechanized loading had 3.2 persons killed per 1,000 employed, while those wholly on hand loading had but 2.0 fatalities per 1,000 employed. Essentially the same ratio persisted in the number injured, there being 140.9 persons injured per 1,000 employed in 1928 in Illinois mines with machine loading wholly as against but 85.0 injured per 1,000 employed in mines using hand loading wholly.

Individual organizations furnish data from which trends may be taken. One company, operating two large mines in the same coal field with production essentially the same, had one mine with the larger number of men on a completely hand-loading basis and the other, with much fewer men, operating largely, but not wholly, on a mechanized-loading basis; the first mine worked two years without a fatality, while the other mine had more than 10 fatalities in one year. On the other side of the picture is the case of a western coal-mining company which operated three mines on a completely mechanized-loading basis from 1925 to 1929, employing between 400 and 500 men, and producing over 4,000,000 tons of coal without a fatality or a permanent total disability, and with less than 30 lost-time compensable accidents. This case shows what can be done, but unfortunately it is by no means the rule as representing what actually is being done.

The effect of mechanization of coal mines on accidents from falls of roof and coal, the major cause of coal-mine fatalities, is somewhat difficult to determine; falls of roof and coal cause almost 50 per cent of the annual deaths in our coal mines, the percentage for the 10-year period 1918 to 1927 being 48.44 and the number killed from falls of roof and coal in that period being 11,140, or an average of 1,114 annually. As indicating the possible effect of mechanization of loading practices on fatalities from falls of roof and coal, the following statement from Bureau of Mines Bulletin No. 319 (from which many of the figures herein given were taken) is illuminating, as the statement is made concerning fatalities from falls of roof and coal:

An examination of the record back to 1911 shows that the death rate per million man-hours was higher in 1928 than in all preceding years but three. Records for the most recent 5-year period, ending with 1928, showed an average death rate 8 per cent higher than that of the five years 1911 to 1915.

The foregoing comment indicates that although our mines should now keep pace with the excellent work of other industries, such as the cement industry and the railroads, in decreasing the accident rate, on the other hand our coal mines during the latest 5-year period for which statistics are available—that period (1924 to 1928) being the one in which progress in mechanization was very rapid—had an actual increase in fatalities from falls of roof and coal (these constituting nearly 50 per cent of all coal-mine fatalities.) It is significant that this increase in fatalities from falls of roof and coal during the period 1924–1928 took place in those activities in mines most directly affected by the new mechanized-loading systems, hence

there is good reason for the inference that the influence of the new systems was in the direction of increasing the hazards from falls of roof and coal.

In studying the cause of 200 coal-mine disasters which occurred from 1910 to 1924, it was found that 15 of the 200 disasters, or 7½ per cent, were fairly definitely assessed against electricity as the igniting agent; studies of the causation of mine explosions during 1927, 1928, and 1929 indicate that in more than 50 per cent of the deaths from mine explosions in those years electricity was the igniting medium, electricity being responsible in one year for more than 80 per cent of the deaths from explosions. It is apparent that electricity, hence mechanization, is becoming more and more the greatest cause of coal-mine disasters; this is due almost wholly to carelessness in the installation and use of underground mechanical equipment driven by electricity, giving rise to arcking and sparking and consequent ignitions of gas or dust or both. Since explosions in coal mines caused the deaths of 2,838 during the period 1918 to 1927, or about 284 per year, and in 1928 caused 376 deaths, this means that at present mechanized equipment and methods are causing 150 or more deaths per annum in our coal mines. In the fiscal year ending June 30, 1929, the number of deaths from explosions of electrical ignition was 282. The following table taken from Bureau of Mines Bulletin No. 319 shows that the explosion hazard in our coal mines has increased decidedly during the relatively recent past or during the period when intensive mechanization of our coal mines has been very actively under way.

Death rate from explosions per million man-hours underground in the coal mines of the United States, 1911 to 1928, by 5-year periods

Five-year period	Rate	Five-year period	Rate
1911-1915.....	0.313	1918-1922.....	0.176
1912-1916.....	.283	1919-1923.....	.228
1913-1917.....	.291	1920-1924.....	.297
1914-1918.....	.229	1921-1925.....	.347
1915-1919.....	.206	1922-1926.....	.393
1916-1920.....	.180	1923-1927.....	.365
1917-1921.....	.170	1924-1928.....	.378

There is good reason for the belief that at present at least half (and probably much more than half) of the fatalities which occur in our coal mines are caused by poor practices connected with mechanization; there is equally good reason to believe that this type of fatal accident is growing in percentage of the whole and possibly in actual number of persons involved. During the 10-year period 1918 to 1927, 21,040 persons were killed at our coal mines, or an average of 2,104 per year; 2,067 were killed in 1928—a year of material reduction in the number of coal-mine workers, due principally to substitution of machinery for manual labor. Since there is no question that mechanization abuses cause the death of more than half of the approximately 2,100 persons annually killed in our coal mines, it thus appears that our highly commended and almost unanimously advocated mine mechanization is responsible for the death of upwards of 1,000 of our coal-mine workers every year. As

mechanization proceeds (as it undoubtedly will), with resultant material decrease of personnel needed to produce our coal tonnage, it appears probable that as the number of workers dwindles from the approximately 600,000 now used to supply our coal needs to an approximate 350,000 or 400,000 (or even less) needed when our mines are thoroughly mechanized, the actual number killed annually in our mines will drop below the present average of 2,100, but the number of fatalities will not by any means fall in proportion to the decrease in the number of workers. Unless a great change is made in the installation and use of machinery, in our craze for mine mechanization we may look to the continuance of the death of 1,000 or more coal-mine workers annually due to mechanized contrivances used (or in very many cases misused) in mining.

Little as our mining men may desire to acknowledge it, there is no doubt that nearly every piece of mechanical equipment introduced into our mines adds to their accident hazard, and that is more likely to be true when the mechanical equipment is driven or otherwise operated by electricity. It is due almost wholly to this fact that the accident rate in both coal and metal mining in the United States has for years been double, triple, or even quadruple that of the mines of European or South African countries; it is also due largely to the increasing utilization of mechanical equipment, especially electrically-operated mechanical equipment, in coal mines that it has been so difficult to make any appreciable reduction in our frequency or severity accident rate, although there has been a steady increase in the coal tonnage produced per fatality. In particular, the explosion and fire hazards have been greatly augmented by the increased use of electricity in the mines.

Mining men as well as electrical and machinery men usually resent publication of data of this description; they say they are overdrawn, are inconclusive because of being fragmentary, are "harrowing," and so on; and the amount of "buck passing" encountered by the coal-mine safety engineer in calling attention to dangers of electricity is remarkable in the extreme. A manufacturer of small booster fans, when confronted with dangers of these small fans near coal-mine faces, especially when electrically driven, shrugged his shoulders and said, "I sell fans; I should worry how they are driven." The machinery manufacturer who purchases from other companies the electric motors which operate his equipment only too frequently washes his hands of any concern as to the degree of safety with which the purchased electric motor may be used underground; in other words, "he should worry" also. The manufacturer of electric motors, or of almost any electrical equipment, seldom inquires into the safety side of the use of the equipment in the proposed sale and leaves that to the mine management. In general, the mine management has a purchasing agent who seldom if ever sees the inside of the mine and who would not be able to interpret conditions if he did see the mine workings, and his prime conception of his official duties is to purchase at minimum cost, with possibly some attention to probable efficiency but with seldom a thought as to safety. In fact, if the safety situation enters into the matter and there is any substantial increase in the price for the safety feature, the purchasing agent usually rejects it because of the price increase; and the salesman,

fearing loss of sale, seldom if ever presses the safety element in his higher-priced product, especially if he has also some lower-priced, less safe substitute. The man at the mine usually gives his order in general terms, relying upon the salesman to supply the correct kind of material or equipment.

This "vicious circle" is in itself sufficient to explain much of the increased percentage of coal-mine disasters due to electricity, but there are also other important contributing factors. State laws and regulations as to electricity in coal mines are usually much out of date, loosely worded, and are now and always were entirely inadequate. In the few instances where State laws are even fairly sensible as to the use of electricity in coal mines, they are not enforced, as there are very few (probably not any) State coal-mine inspectors who have anything like a sufficient knowledge of electricity to enable them to interpret the safety of underground electrical conditions as a prior requisite to enforcement of adequate electrical regulations. Company mine-safety inspectors seldom are sufficiently well grounded in electricity to give competent advice as to safe underground practice in electricity, and very seldom is a competent electrical man employed to make periodical underground inspections as to safety in electrical installations or safe use of electrical equipment. "White collared" electrical engineers frequently map out elaborate underground electrical systems but seldom if ever go underground to aid in correct or safe installations, or to "look things over" during operations to see that the system is operated as designed.

In view of the fact that much electricity is being used and will be used increasingly in coal mines, it appears that the electrical people (engineers, manufacturers, and others) owe it to themselves to take the lead in directing thought toward the safe use of electricity rather than trailing along as obliging followers of mine officials whose knowledge of safety with electricity is frequently nil. Unless intelligent direction is given toward safety in installation and use of electricity in the coal mines of the United States, there is very likely to be such a series of disasters charged to electricity that as a consequence a definite barricade will be erected against further extensions.

In view of the fact that almost any kind of electric arc may ignite either coal dust or explosive gas and start a disaster in almost any kind of a coal mine, it would appear that all electrical appliances or equipment used in coal mines should, in so far as feasible, be arc proof; hence there should not be allowed to go into any coal mine any electric motor, switch, etc., of the nonpermissible type. This appears drastic, but in the final analysis it is logical and in time will be the rule. Electrical manufacturers should, therefore, bend their efforts toward construction of nothing but permissible equipment or appliances for use in coal mines, and electrical salesmen should advocate the use of nothing but permissible equipment for all coal mines whether gaseous or so-called nongaseous.

Electrical men (engineers, manufacturers, and salesmen) should initiate and forward a movement looking to the establishment of sensible safe electrical standards not only of electrical materials, appliances, equipment, etc., but also of sane, safe practices and installations in mines which use these electrical materials and appli-

ances. These standards should be specific rather than generalized, as is so frequently found in attempted standards; generalizations usually mean little or nothing and get nobody anywhere at any time.

There is every reason why mines should be as thoroughly mechanized as can be done with due regard to the safety of the mines and of the mine workers; but in many, if not in most, of the intensive mechanization schemes not only of the past and present but also as projected for the future, safety has been the last rather than the first consideration. Many mines have conditions as to gas and dust and others have conditions as to excessive moisture which make electrical installations of any kind at or near faces dangerous in the extreme. A return to the use of compressed air may well be given consideration in mechanizing gassy or dusty face regions, even though costs and flexibility with compressed air will be by no means as favorable as with electricity.

Few if any States have to date done their part in trying to safeguard the lives of mine workers in connection with mine mechanization, or with any other phase of mine-safety work. In the approximately 30 States which produce coal, there are about 170 district coal-mine inspectors who are supposed to go into mines to look after the safety of the approximately 575,000 persons engaged in coal mining, or about one inspector to each 3,400 coal miners. In one State the inspectors are each expected to supervise the safety of upwards of 6,000 men; and several States with dangerous mining conditions and large numbers of miners place the inspection service for 3,000 or 4,000 men under one inspector, when as a matter of fact few if any State inspectors can give adequate service to as many as 1,500 men. Very few of the State inspectors are technically trained and very few are paid much above the wage of the mine worker; generally they are puppets of politics, as only a small number of States have civil service or similar protection for mine inspectors, and in many instances are chosen and held in office for personal or political popularity rather than for a knowledge of safety in mines. Very few of the States have anything approaching a systematic method of conveying to miner or to mine operator up-to-date ideas as to mine safety, and in very few of the States is there much more than a gesture toward enforcement of the usually inadequate or antiquated laws on mine safety. The States have been particularly remiss in connection with safeguarding of mines and miners against hazards from electricity. Notwithstanding the fact that more than 50 per cent of those now killed in explosions in our mines owe their deaths to electrical ignitions of gas or dust, and also that electrical contacts annually cause about 90 deaths in coal mines, there are few if any of the State inspectors who have anything like a sufficient knowledge of electricity to give adequate advice to miners or mine officials as to the safe installation or operation of the electrical machinery now being placed in mines with little or no precautionary measures as to safety.

The coal-mining people of the United States, including miners as well as mine operators, have it in their power to make mechanized mining much safer than the older more primitive "manual" mining, provided the requisite amount of personal effort is expended in really trying to bring about this increased safety; however, to date by no

means the right kind or the required amount of effort has been given to the end that this desirable situation shall be brought about.

While the main underlying factor in the intensive mechanization of mines now under way has been reduction in costs, it is entirely probable that if safety is taken into consideration to anything like the extent that it should be, costs will be lowered little if at all. Notwithstanding this, the mechanization process will and should proceed. If coal-production costs should ultimately increase, they should be passed to the public, where they belong, rather than be decreased by attempting to operate coal mines at lessened costs brought about largely by unsafe practices.

DISCUSSION

Chairman ROACH. I think all of the papers on the morning program were good. Mr. Meade discussed the subject from the point of an administrator; Mr. Kearns presented the thought that prevails in Ohio on proper safety. There might be some doubt as between the administration of rigid labor laws and the promotion of proper safety education in industry. I do not think there is. I doubt whether we could have satisfactory or efficient labor-law administration unless it went hand in hand with the promotion of proper safety education.

If our labor laws are not based on sound engineering practices, they are faulty. If the promotion of safety education is not predicated or based upon sound engineering rules of industrial practice, then that kind of safety education is wrong, because, after all, safety engineering rules are nothing more than a group of rules that are based upon ascertained facts. The emotional appeal to the worker on the bulletin board is not going to take the place of a practical mechanical guard on the power press. The appeal to the worker on the press is not going to stay the descending ram if the worker places his hand under the press and then suffers a severe accident.

Safety education should teach the man who operates a plant the value of efficiency in work, the necessity for mechanical guards, the necessity for safe structural premises. If safety education does not do that, you should call it by some other term, because it is a misnomer in that particular instance. I know that many people—I think some of them in our own State—think if they advocate the promotion of safety education in industry, some invisible, intangible thing that has no substance of itself will take the place of the expenditure of time, money, and effort necessary in the installation of mechanical safeguards. A properly conducted plant, however, pays strict attention to mechanical engineering details; and it pays as much attention to the selection, the training, and the supervision of every human unit in the plant. When that is done, accidents are reduced to a minimum. They just do not occur, with the exception of those things beyond the ken of human efforts.

Secretary STEWART. Mr. Heinrich made the statement (which is accurate, I think) that the workman gets \$148 on the average in all compensation cases, did he not? He also made the statement that each accident case costs \$246. I wanted him to say, if that is what he meant, that it costs \$98 to get \$148 to the man.

Mr. HATCH. I can answer that question. That is what he meant and that is a fact.

Mr. PARKS (Massachusetts). I will not take up time discussing the papers that I heard this morning, but I want to make this comment: Mr. Stewart's question indicates how hungry everybody here is to discuss those papers that were given this morning. They left some things in the air that need explaining. The men are going away and there will be nobody here to explain them, because so much has been put on the program that all we can do is sit and listen to a lot of papers which are very interesting and valuable, but there is no chance to ask a question about them. That is what will happen to the afternoon program; I can readily see that.

Mr. STUTSMAN (North Dakota). For the benefit of our secretary, Mr. Heinrich made the statement that 40 per cent of the cost of these accidents went into other items. He was referring only to insurance companies. He was not referring to the State funds, where we have to pay only 14 per cent.

Mr. MAGNUSON (Washington, D. C.). The speaker before the one who has just concluded says there is too much on the program. I should not like to say that. It is a heavy and good program, but there is not too much. Mr. Stewart has had wonderful success in getting these papers in advance of the meeting. It is practically a 90 per cent batting average in getting them printed and before us, and I think that is nothing short of a marvelous achievement. Instead of having the papers read completely, why not have the man who presents the paper summarize his paper in a paragraph and then go ahead with discussion?

Yesterday afternoon I had looked over and read practically all those papers before they were read aloud and to that extent I was prepared to start any discussion, not that I would, necessarily, but those who had read a paper would have been in position to do so, and then we could start after a two-minute explanation by the man. I do not want to push the idea of cutting down the program, but it seems to me that is a practical way of expediting proper discussion.

Chairman ROACH. Probably these gentlemen who came here intended to read their papers and did not attempt to summarize them. I would be willing to ask each one of the speakers if he would care to do that, but if he should prefer to read his paper, I am afraid we should have to let him do it.

Mr. McSHANE (Utah). These men have put in a lot of time on those papers. Some of us have not had the opportunity to read the papers. It is fortunate for those who have, but I am free to say I do not know a thing about a paper that has not been read to me, when I have not had an opportunity to read it myself. I suggest we go through with this program as it is, and that we have a night session to begin at 7.30 or 8 o'clock to-night, and that will give everybody who wishes to do so, an opportunity to discuss these things.

Mr. MAGNUSON. If that is a motion, I wish to second it.

[The motion was carried.]

Chairman ROACH. The next paper on the afternoon's program will be a paper by Mr. W. Graham Cole, director of safety service of the Metropolitan Life Insurance Co., who will discuss Handling-Material Accidents.

Handling-Material Accidents

By W. GRAHAM COLE, *director safety service, Policyholders Service Bureau, Metropolitan Life Insurance Co.*

With a deadly thud a pair of steel-cast engine frames weighing seven tons fell to the machine-shop floor directly in front of the tool-room door and broke in two. These engine frames had been cast in the division shops of a large western railroad and shipped on a flat car to the system shops where they were to receive some additional machine work.

The cause of the unfortunate incident was clearly "lack of supervision." The foreman in charge of the stores department had the flat car run into the shop and instructed two men to unload the frames. These men had had no previous experience in handling material larger than small motors and their foreman failed either to instruct them or to supervise their work.

A 10-ton crane was available for removing the engine frames from the flat car and the cables which were used for swings had recently been tested. Not being acquainted with this type of work, the workmen placed the rigging on the engine frames in an improper manner, causing an unusual strain on the sling just as the load had reached its destination. The sharp edge of the engine frame cut through the cable at the point of extreme strain, dropping one end of the frame to the floor and causing additional tension which resulted in the entire cable snapping, uncoiling, and falling in a heap on top of the broken frames.

Six hundred men were engaged at work in the shop at the time the incident occurred. Quite naturally all stopped work to see what had happened. Perhaps it is a conservative estimate to say that each man returned to his work in 10 minutes. This delay, brief as it was, caused a loss of 100 productive working hours, for which of course the company had to pay.

Two hundred and fifty men were working on the aisle which was fed by the incapacitated crane. These men were required to remove by hand or hand truck all the material on which they were working for the balance of the day. This condition seriously decreased the efficiency of the group and delayed production. A foreman and crew of men spent an entire day repairing the crane, which also required repair parts and a new cable. The engine frames were shipped back to the division shop for recasting. Considerable time was spent by the chief engineer, division superintendent, foreman, and others in investigating the cause of the incident. The total cost to the railroad company due to the improper supervision of this particular job was, as the above figures indicate, enormous. Surprising as it may seem, however, the incident was not an accident according to the usual interpretation and was not in accordance with the reporting requirements of the Interstate Commerce Commission because, quite surprisingly, no one was injured.

This story describes a rather extreme although true occurrence. However, it is presented because it indicates in a forceful manner the fact that the cost of all accidents in industry can not be measured alone by claims awarded or insurance premiums paid. Undoubtedly in every material-handling personal-injury accident there is a large amount of uninsurable cost resulting from destruction of property, decreased efficiency, delayed orders, etc. In addition these uninsurable costs frequently occur without accompanying personal injury and in most cases, unfortunately, are looked upon as an unpreventable interference to operation.

To obtain a true picture of the cost of "accidents to industry," would it not be advisable to define accidents in a much broader sense than is customary and to state perhaps that an accident is an incident which causes damage to machinery, spoilage of raw or finished products, injury to tools and equipment, decrease in operating efficiency, or personal injury to employees. If industry generally would accept such a definition of accidents greater attention would undoubtedly be given to accident prevention, not alone as a means of preventing human suffering and decreasing insurance premiums but as an outstanding method of improving the efficiency of the entire organization.

Undoubtedly these so-called indirect costs are greater in accidents resulting from the handling of material than they are in the case of accidents resulting from other causes. It has been estimated that personal injuries alone resulting from this type of accident cost American industry and American employees about \$250,000,000 annually. If we add to this enormous sum the cost of damaged machinery, inefficient operation, and curtailed production incident to these injuries and the large number of accidents in which no injury occurs, we would obtain a figure of staggering proportions and one which would represent a fairly large percentage of our annual bill for handling material.

Furthermore, we find that handling-material accidents represent about one-third of all personal injuries in industry in the United States and result in approximately one-fourth of the deaths and one-fourth of the time lost by industrial workers through accidents. In many instances the principles applicable to this phase of the industrial safety problem are also applicable to the problem as a whole. In this paper, therefore, I am using the word "accident" in accordance with the broad definition just mentioned and am considering handling-material accidents as one of the greatest causes of inefficiency as well as personal injuries in industry.

Experience in industrial-safety work and particularly in the prevention of material-handling accidents indicates that the success of this work is dependent largely upon actual knowledge of how accidents occur in the particular industry under study and upon well-trained and efficient supervision. With these two essentials it is usually easy to take the proper steps to provide physical safety and to train the employees in safe practices.

Too frequently in the past those engaged in accident-prevention work have failed to approach it from the pure engineering standpoint. To be sure, a great deal of engineering has been utilized in safety work, in the design of guards, and in the revision of plant

processes. On the other hand, the cases have been rare when a safety engineer has given the same amount of engineering study, survey of conditions, and technical research which an individual in other fields of engineering would give to the problems confronting him. The engineer called upon to design a railroad bridge over a river makes certain tests and studies of the soil both on the banks and in the river bed on which the bridge foundations are to be constructed. He must know the current of the river and the high and low elevation. He usually finds it necessary to learn something of the maximum wind pressure he will encounter and the usual snowfalls which may be expected. He also wishes to ascertain the maximum weight of locomotives and trains which utilize the bridge and the speed at which this equipment will be operated. With these data determined, the bridge engineer can proceed to design the bridge, basing his design largely upon formulæ and established strength of material determined by those who have had experience in designing similar constructions.

The safety engineer in approaching the problem of reducing accidents in a given industry frequently proceeds without this analytical study. He safeguards every apparent unsafe condition in sight and undertakes a broad educational campaign. Although such measures are essential and have produced excellent results, undoubtedly better results would be obtained if the safety engineer knew in advance just what types of accidents were being encountered, what particular machines were in reality accident producers, and then took definite steps to remedy and overcome conditions and hazards which his study indicated actually existed. Furthermore, if the safety engineer made a careful study of the employees engaged in the work under consideration, he would undoubtedly find that a small percentage of these workers were responsible for a large percentage of the accidents—that this accident proneness was not spasmodic but continued year in and year out with the same employees, unless steps were taken to correct it. He would also find that the employees involved in personal injuries were also involved in many more accidents not resulting in personal injuries but affecting the efficient operation of the property. Although these facts may be found to exist with respect to all kinds of accidents they are particularly true with respect to material-handling accidents where the personal element plays so large a part.

With knowledge of this sort a safety engineer would be in a position to develop intensive efforts among the high-accident employees instead of wasting efforts upon those workers who consistently work year in and year out without injury. By studying the characteristics of the high-accident employees he would be able to determine very definite measures for aiding these employees to overcome their accident-prone habits and characteristics, and he would also be in a position to recognize the signs of such habits developing in other employees.

Permit me to give two examples to illustrate the thoughts just expressed.

A large steamship company with piers on the water front of New York City had experienced an exceedingly high-accident record among its 600 longshoremen. An initial study of the problem

indicated that very little could be accomplished purely by proper safeguarding. As the longshoremen were engaged in squads of 50 each morning and dismissed in equal squads each evening, an effort to conduct educational work among these workers would, over a period of a year, necessitate training practically all the longshoremen on the entire New York City water front. The problem was approached from an engineering viewpoint and an analytical study of the accident record started. It was found that more than 85 per cent of the accidents resulted from handling material. An analysis was then made indicating the severity resulting from each general classification of freight.

With this information available the supervisory force was taught how to study proper methods of handling various types of freight, one month being given to each commodity in the order of its severity as an accident producer. The result was an awakening of interest in their work among the supervisory force; a decrease of accidents in each type of freight as it was studied; and a reduction of a few cents at least in the cost per ton of handling the freight was noted. During the period of the first year a 54 per cent decrease of the severity rate was also noted.

A study was made of the accident experience of the motormen of one operating division of a large midwestern electric railway company. In this study property damage as well as personal-injury accidents were included and the severity of each was discounted in an effort to determine the underlying reasons. It was found that one-third of the motormen had two-thirds of the accidents and that this one-third over a period of a year averaged more than one accident per thousand car-miles. The best man on the division could drive his car 5,000 miles per accident, the poorest man could go only 500 miles. All of these operators were driving the same type of car, over the same streets, under the same changing weather conditions, in the same traffic congestion, and under the same crew of supervisors. The only apparent difference that made the best man's record ten times as good as the worst man's record was in the individual himself. With this information at hand it was possible to analyze the personal habits, characteristics, and physical conditions of the individuals and to take definite steps to apply direct remedies. In six months 47 of the 50 men improved their record, 30 of them showing an average of less than one accident per thousand car-miles and resulting in a reduction in the group as a whole of 43 per cent.

In making studies of this nature it is not infrequent to find that the outstanding requirement for effective accident prevention is improved supervision.

A subway contractor in New York City who had experienced a high accident record stated that he was interested in safety and he was sure his foremen were, as they attended a weekly safety meeting. An analysis of accidents by occupations developed the fact that an unusually high percentage of personal injuries occurred in the foreman group and that only a small percentage of all the foremen were involved. A further analysis showed that the employees who were involved in the greatest number of accidents were working for the few foremen who themselves sustained the largest portion of accidents in the foremen group. It furthermore developed that these

particular foremen were usually absent from safety committee meetings. In other words, the educational work conducted by this contractor had, because of lack of careful analysis, been aimed at the larger portion of this force which needed it least and had entirely failed to reach the smaller portion which needed it most.

I have deliberately confined my remarks to certain fundamentals of safety work, which perhaps are applicable to the prevention of all types of accidents, rather than stressing methods of preventing specific material-handling accidents. To my mind the latter is largely a matter of detail that will be taken care of in a regular organized manner when a knowledge is obtained as to the cause of accidents and a corps of competent supervisors is provided.

With these essentials the actual methods of preventing material-handling accidents may be summarized briefly under four headings: 1. Revision of processes; 2. Safety devices; 3. Housekeeping; 4. Training of employees.

Outstanding progress has been made in the revision of existing processes or in the development of new processes for decreasing cost and reducing accidents incident to the handling of material. The introduction of power-driven machinery such as cranes, conveyors, and industrial rail equipment has increased the efficiency of material handling, thus decreasing the personal exposure and causing a marked reduction in personal injuries. In connection with the progress being made in the development of mass production, additional thought is being given to labor-saving devices and safer methods of operation.

With the introduction, however, of power-driven machinery for the handling of material there is an increasing demand for proper and effective safeguards. In accordance with acceptable standards, State laws, and the insurance companies' requirements, it is usually essential that gears be guarded, exposed line shafts protected, limit switches provided, and proper approach for the operators be constructed for overhead cranes. In addition it is considered good practice to make frequent inspections of all rigging material such as slings, cables, ropes, etc. In cases where it is essential, equipment may be obtained for the protection of the workmen themselves. Gloves have been devised for use when handling sharp and rough objects. Various types of shoes are available for the protection of workmen who are handling extremely heavy objects or molten metal. For employees handling dusty articles, chemicals, acids, etc., special types of goggles have been devised and forms of protective clothing are in use.

The safety as well as the efficiency of handling material properly is usually dependent in a very large part upon the methods of housekeeping followed on the property. Bins, racks, etc., for the disposal of small material in and around industrial plants usually decreases the frequency with which this material must be moved and also encourages employees to place it in safe locations. The careful storage of lumber, flasks, billets, and other articles indicates a well-kept piece of property and helps to overcome accidents which would otherwise occur in the handling of this material. Clear, unobstructed walk ways and clean, dry, well-conditioned floors are essential aids in the prevention of material-handling accidents.

With labor-saving devices, proper safeguarding, and a well-maintained cleanly property, frequent accidents will still occur, particularly in the handling of material unless employees have been carefully taught how to do the work to which they are assigned and unless their interest in the prevention of accidents can be maintained. It is usually considered advisable to start this education and training at the time of employment. Many acceptable methods, including the organization of safety committees, the conduct of accident-prevention contests, the advertising of safety by means of bulletin boards, blackboards, pay-roll slips, and the holding of employee meetings have all proven effective as a means of stimulating interest and reducing accidents. In addition it is frequently necessary to study the individuals and to take certain steps to overcome personal habits and characteristics which are productive of inefficient operation as well as personal injuries.

To summarize, therefore, the prevention of material-handling accidents requires an engineering approach to the problem in order that an actual knowledge may be determined of the fundamental causes of accidents so that the proper steps, either in the form of mechanical guarding, the improvement of operating conditions, the training and education of employees, or the correction of individual habits, may be taken.

DISCUSSION

Chairman ROACH. The paper will be discussed first by Mr. Charles Senft, of the Globe Indemnity Co., of Newark, N. J.

Mr. SENFT. As Mr. Cole has indicated in the paper just read, a large majority of accidents occurring in industry, serious or of minor nature, are attributed to falls, falling material, or handling material.

The accidents due to these causes are the safety man's constant and certainly his greatest problem, as practically all industries, regardless of the product manufactured, are faced with the problem of handling material and are therefore also faced with the additional problem of devising ways and means to eliminate accidents attributed to the causes mentioned.

Before attempting to apply remedial measures to eliminate accidents, we must determine by investigation and, unfortunately, sometimes by costly experience, fundamental causes of these accidents. It therefore seems advisable to concentrate our attention to-day, first, on causes of accidents attributed to the subject assigned to me, and then build up our case by considering, second, remedial measures that will eliminate recurrence from these causes.

Let us consider the matter of piling material. Anything placed in piles, in bulk or in large, or heavy, or small and light-weight units, must be, at some time or other, moved. Careless methods of piling will contribute materially to the grief of the industry so far as accident experience is concerned.

The problem varies in practically all classes of material piled. Storage and handling methods in connection with bulk material would vary considerably from methods used in connection with pipe, scrap metals, barrels, boxes, lumber, etc. Bulk material should, where possible, be stored in elevated bins so arranged that vents or chutes are provided with outside control for removal of material.

Men should not be permitted to enter bins either before or after emptying work has started. If flow of material is obstructed, necessitating that an employee enter the bin, a safety rope firmly attached to the man and securely lashed to some part of the overhead structure should be provided. A helper or watcher should also be placed in such a position that immediate assistance can be rendered in event of emergency. The investment involved may prove well worth while.

Some materials stored in bulk or in piles, such as ammonium sulphate used in fertilizer (wet-mixing) plants, solidifies, and employees who undercut piles while removing material thereby expose themselves and others to the hazard of falling material. This practice should be discouraged.

In a wet-mixing fertilizer plant in Norfolk, Va., some years ago, I investigated an accident that resulted in the death of the employee involved. In this case the employee was engaged in removing material from a pile in a storage building. He had undercut the pile, leaving an overhang that extended out over the floor for a distance of possibly 4 feet. While cutting into the pile with a pick, a section of the overhang broke loose, falling on the man and killing him instantly. The height of fall was approximately 12 feet and the falling material was estimated to weigh 1 ton. This accident could have been avoided by proper instruction to the employee. Under no circumstances should piles of material be undercut, and all work of removing such material should be started from the top.

It is always more satisfactory, where this is possible, to handle bulk material by mechanical equipment, eliminating considerable labor, and thereby reducing the accident exposure and resulting in considerable saving in dollars and cents. Electric trucks speed up operations in connection with handling bulk materials and eliminate the old hand wheelbarrow. A greater number of accidents are caused by the humble wheelbarrow than by the steam engines that furnish power for our plants.

Mechanical hoisting equipment places in the hands of employers of labor a means of reducing labor costs and of reducing accident exposure in handling all bulk material. It should be used in all instances where the quantity of material handled justifies its use.

Too much stress can not be brought to bear on the importance surrounding the matter of safely piling material. There is a safe and an unsafe method of piling any and all kinds of material. Barreled, boxed, and baled material always presents an ever-present hazard unless piled safely. Kegs and barrels piled on end are more stable than when laid on their sides. Planks on top of each row of barrels before others are placed on top also helps to stabilize the pile.

Piling barrels in triangular shape is usually considered a safe method. Assuming 20 barrels are stood on end on the ground, the next row would carry 19 and so on until the peak of the triangle or pyramid is reached, the kegs or barrels in each succeeding row being placed over the chimes of the two barrels under them. This arrangement conserves space.

I do not favor the old method of piling barrels on their side, although, where this seems necessary, racks can be constructed and laid under each row as the pile builds upward, lessening the accident

exposure. Ends of racks should carry chock blocks of sufficient height to prevent barrels being forced out and over them by pressure from above.

In removing barrels or kegs from piles, regardless of the method used in piling, work should start from the top. As many serious and disabling accidents have resulted through the improper piling and removal of barrels and kegs from piles, it is well to consider careful methods of piling and safe method of removal.

The piling of baled materials within buildings, strange as it may seem, presents a serious hazard. Weight of materials baled is usually excessive, and in piling this weight should be evenly and equally, or as much as possible, distributed on the row of bales beneath and not permitted to rest on the side walls of the building.

Collapse of buildings and pushing out of side walls have resulted from unsafe methods of piling, due largely to the fact that as a pile of bales was built up, each succeeding row rested in such a manner that at the top the side walls of the building were bearing a weight not anticipated by the architects and engineers. Regardless of limited space or congested storage conditions, extreme care should be exercised by those charged with the responsibility of piling baled materials. The floor should carry the weight of baled material and strength of floor should be known before piling is begun. This should also govern the height of piles.

It is safer, in piling bales of excessive weight, to use chain blocks or cranes. Accident exposure is reduced and greater accuracy in piling is brought about through this procedure.

Hand-labor methods in piling of heavy materials increases accident exposure by reason of the fact that more men are employed, and these men, by the very necessity of the number engaged in this work, get in each other's way with the result that accidents are caused. Mechanical or semimechanical means of piling are therefore desirable.

The unsafe piling of boxes and crates presents a serious accident possibility. Because of unusual shape and size, it is not always possible to crosstie boxes in piling. Boxes of unusual shape should always be piled on the side having greatest area and presenting a larger and safer bearing surface. If the weight is not excessive and the height of piles is limited, this permits efficient handling if hand labor is employed, although the physical condition of these men should be known. This can be determined by physical examination. If weight is excessive, mechanical means should be employed.

Some boxed and crated materials are very bulky and unwieldy, top-heavy and unstable, largely due to flimsy construction of box or crate and the small area of bearing surface of material or machine within the inclosure. Here extreme care is necessary.

Plate glass, bicycles, mirrors, table tops, etc., are usually piled on edge in crates or boxes and are removed in the same position. A tip over—a moment's thoughtlessness on the part of one workman—may result in serious injury to himself or others. Handling in storing and rehandling again in removing such material from storage should be done with crate or box in horizontal position with plenty of labor to insure an equal and not excessive distribution of weight to the individuals engaged in handling.

Lumber yards present an ever-constant accident problem. Improper placing of mud sills, washouts in yard due to excessive rainstorms, high wind, etc., all contribute reasons and justification for limiting both height of piles and careful alignment of mud sills or bearing surface on which piles are built. Under no circumstances should the height of piled board lumber in open yard exceed 12 feet. I have seen, as possibly you have, piles reaching a height of 20 feet and more.

In one plant in the South where board lumber was stored under the open-shed method, a gallery or very substantial footwalk was provided around the various bins at a height of 10 feet above grade. Advantage obtained by this method must be clear to all. Records of grades, kinds, and dimensions were kept in the office corresponding with the lumber stored in numerous numbered sections of the sheds. Protection or inclosure on ends and one side only permitted air-drying and at the same time, by reason of the gallery or footwalk I have just referred to, permitted employees to have easy access to material desired, and by reason of low height of footwalk from grade permitted easy and efficient handling of materials both in storing received lumber and in filling orders for autotruck delivery. A hand-rail of sturdy construction and 42 inches in height from platform provided leverage and sliding base for material incoming and outgoing and at the same time protected employees from falls. Accidents, with reasonable care and supervision, in a yard of this kind would quite naturally be found to be the exception rather than the rule.

Another very serious hazard exists in the industrial plant that too often is not given necessary consideration. I refer to hand tools—their care, use, and abuse. This is a subject in itself and one, therefore, that I can only very briefly touch upon to-day. Yet, through the careless handling of this class of tools, many serious and disabling and costly accidents are caused each year. Knives, shovels, picks, axes, sledges, hammers, hatchets, chisels, wrenches, etc., if carelessly handled, are often dropped on persons passing under the operations, or passing by operations. Employees using these tools are also more often involved in accidents.

You have probably seen in your experience, bricklayers or masons, or carpenters, drop at some time or other every tool in their kits, except the spirit level. There is a reason for this. The mechanic, having purchased this tool and being thoroughly familiar with its use and its limitations to punishment or abuse, is fully aware of the fact that when it falls a new level must be purchased. Oh, yes, hammers, axes, trowels, wrenches, and a host of other hand tools may be thoughtlessly or carelessly dropped from an elevation and the mechanic is reasonably certain that with very minor repairs or adjustments, the tool will be then available for use again. Not so with the spirit level. It therefore seems to me that to eliminate the falling hand tool hazard, we have only to convince the employee that he should exercise just that wee bit of extra caution in handling all tools that he automatically exercises when he picks up the spirit level. Never in my experience have I seen or heard of a man dropping a spirit level.

Where men are of necessity working under congested conditions, special design of handles or of the tool to meet the condition is helpful in eliminating costly accidents.

Careful inspection of tools used for handling materials, such as shovels, picks, bars, etc., will minimize the trouble from such causes as splintered handles, heads flying from handles due to not being properly wedged, pinched fingers and conditions of this kind that result in so-called minor injuries, all of which, due to some peculiar local condition of the individual of which the employer is not aware, may develop into a potential serious case involving much human suffering on the part of the individual involved and causing a loss involving much coin of the realm to the employer.

A short time ago, in the State of Pennsylvania, I came across a case that illustrates clearly the possibilities that exist in the so-called minor accident, although this was not an accident attributed to the use of hand tools.

An employee in a machine shop reported to the nurse in the plant hospital at about 4 p. m. that he had a foreign body in his left eye. Careful examination failed to disclose a foreign body there. He was told by the nurse to report to the plant physician at his office that evening. The employee reported as directed, but the physician also failed to locate anything foreign in the eye. The plant physician instructed the employee to report to the eye specialist at once. However, 48 hours elapsed before the eye specialist was given an opportunity to look at this man's eye. Pure neglect on the part of the employee, of course, but let us glance at the results.

When the employee finally presented himself to the eye specialist, infection had set in to such a degree that the specialist advised immediate removal of the man to an eye hospital 200 miles distant. At the hospital it was decided that the eye should be removed, yet no foreign body could be located. The supposition was that this employee (a machinist) had by some means splashed cutting fluid in the eye and a cataract, theretofore unnoticed, immediately started to assert itself because of the irritation set up by continuous rubbing.

The estimated cost of the case, under the provisions of the workmen's compensation act, was \$1,800, but this did not take into consideration the suffering of the man nor the intangible cost to the employer.

All of us who have had shop experience have at some time or other had foreign bodies (emery or what not) removed from our eyes, but this poor fellow, because of some peculiar and purely local condition unknown to his employer, and in all probability to himself, involved in what all of us would consider a very minor accident, was faced with the horrible possibility of losing his eye. The employer's loss in dollars and cents can never be accurately determined, but it is safe to assume that if the case cost the insurance company \$1,800, the cost to the employer was at least \$7,000. Lack of time precludes an explanation of this, but I will be glad to elaborate on this matter during the period reserved for discussion.

So-called minor accidents resulting from the use of wrong tools or tools not properly inspected and maintained may contribute, due to the cause mentioned above, just as much trouble as the case I have just cited.

Material is often handled, as are tools, on ladders. Need I direct your attention to the serious possibilities that are likely to result from a broken or unsound rung in a ladder or from the kicking out of the ladder legs while men on this equipment are handling material. Careful, conscientious, and regular inspection of ladders will eliminate this class of accidents and the suffering and economic loss that always follow a catastrophe of this kind. All ladders, steps, and other means of access to power shovels, cranes, or work at elevated levels, etc., should be regularly inspected and should be kept in a good state of repair. Spikes or nonslip dogs should be provided on all single ladders in use in the plant.

Falls, whether they be from an unusual height above ground, on floors, or at grade are usually costly. In 1923, falls constituted 15.8 per cent of the injuries to workers in New York State. In 1929, the percentage had increased to 19.1 per cent. In 1929, falls on the same level—that is, at grade or on floors on which work was being done—exceeded falls from a different level, but the cost of the latter, as you may well assume, was more than twice that of falls on the same level. Would you question my statement that a large number of these accidents occurred while handling materials?

Another interesting fact is available. The percentage of injuries due to mechanical appliances has decreased from 25 per cent of the total in years prior to 1923, to 15 per cent in 1929. This certainly indicates that insurance engineers and State inspectors have accomplished something in the direction of mechanical safeguarding and improvement of physical conditions in the industrial plants of the country, which we are all frank to admit could never have been accomplished without the wholehearted support and cooperation of the management and men in those industrial plants where this service was rendered.

In 1923, handling objects and tools and, by the way, I am still referring to New York State, was the cause of the largest number of injuries, with mechanical apparatus second, and falls of workers third on the list.

Falls of workers is a subject in itself and one that is so exceptionally interesting to me that I am going to crack the total number of cases down, as the chemist says, into several individual causes. In the falls from a different level, 2,587 were on stairs and steps, 1,525 of this number being caused by the foot slipping and the heel catching. In the falls on the same level, 3,556 were caused by slipping of foot, 2,463 by loss of balance while handling bulky objects (certainly handling material), and 1,519 by stumbling over objects, a total of 7,538 of the 9,832 falls on the same level. The total cost of these accidents by falls in New York State alone was \$7,894,178 or an average of \$411 for each case. I am sure we all will agree that falls are costly when we consider the experience of this single State.

I direct your attention to the additional exposure existing where a steam shovel or crane is operating in the vicinity of high tension electric or high pressure steam lines. Some of these lines, strange as it may seem in this modern age, are located as close as 24 feet above grade. As a matter of fact, I found a high-pressure steam line recently in a central State city 10 feet above grade. A contractor was preparing to open a trench and lay a 42-inch water main immediately

underneath a section of this line. The exposure, under these conditions, must be apparent to anyone sufficiently interested to give a passing thought to the matter. Yet serious and disabling and even fatal accidents have occurred from similar conditions.

It behooves the careful shovel operator to survey carefully his surroundings before proceeding with the work, and in the event that his judgment tells him that lines, either electric or steam, are so located that he will damage, destroy, or break them in the course of his work, operations should be immediately suspended until these lines are removed from the danger zone. Yes, my friends, this is handling material and I do not feel that I am departing in any way from the subject assigned to me when I refer to steam shovels, cranes, or any other hoisting equipment.

I am firmly convinced that as causes, through careful and thorough investigation, are charged to a large extent to the thoughtless or careless acts of the human element, we will make progress in the right direction only when each individual shoulders his share of his responsibility by exercising care and caution on the job, on the highway (whether as a pedestrian or the operator of a motor vehicle), or in the home. Life is our most precious asset—certainly it can never be replaced. I submit we give careful thought to the matter of increasing our valuation of it, if it is to be prolonged.

Careful supervision and strict enforcement of shop discipline by the supervisory force will have a very decided bearing on the final determination of the accident experience.

And now that I have mentioned supervision, suppose we elaborate on this, because it has a very direct bearing on accident experience regardless of how extensive or progressive the management's attitude may be for improving plant conditions. Discipline, we all agree, must be maintained; unsafe practices must be discouraged and safe practices encouraged among employees else our industrial structure is undermined and, being undermined, falls.

Who is the logical member of the industrial institution to whom we should charge the responsibility of enforcing shop or plant discipline? Who should discourage unsafe practices and who should encourage by word and deed safe practices among employees?

The president and executive officers of the company are busy with methods of increasing efficiency of the organization and in transmitting orders received from the sales staff or office staff to the foremen.

The foreman is busily engaged in filling these orders and in expediting the delivery of these sales. Therefore, he is the one man who is in direct contact with the employees of the department and who among all the various members of the organization, executive or supervisory, is in a better position to carry on these activities directly bearing on accident experience. He must have just about all the desirable characteristics that go to make up the successful man in any other walk of life, and, above all, he must be courteous and tactful in his contact with the employees under his supervision.

My friend, decide, approve, and provide all the devices and safe working methods you can think of for the protection of your employees and after this is done, if you sit back calmly and nonchalantly, supersaturated with confidence that your accident problem is solved, you are due for a sad awakening. Losses from accidents on which

you pay the freight, regardless as to who your compensation insurance carrier may be, will continue to mount upward at an alarming rate because you have failed to consider the human element.

As it has been definitely established beyond the shadow of a doubt that 85 to 90 per cent, and sometimes in individual industrial institutions 95 per cent, of all accidents occurring can not be attributed to failure of machines or to failure on the part of the management to provide mechanical safeguards or improve plant conditions, but to the failure of the human machine, we have a very definite problem before us. Educational work among employees, if properly directed, causes employees to become safety-conscious. Men who think of safety are seldom involved in accidents the cause of which can be traced to their carelessness or thoughtlessness. "I didn't think" is a much used and well-worn alibi that has never prevented accidents.

The value of educational work is therefore clear and success is assured only when this work is properly organized and directed.

Educational safety work is a subject in itself and I will not elaborate any further than to say that without it any purely mechanical safeguarding program is useless and almost a complete waste of effort.

And now, in conclusion, I should like to present for your consideration the safety tabloid submitted by the Ohio Industrial Commission, to whom I gratefully acknowledge some of the facts and figures included in this paper—"If war is hell, we are lacking in something frightful with which to compare industrial accidents."

Chairman ROACH. This paper will be further discussed by Mr. William H. Kiler, of the Hercules Powder Co., Wilmington.

Mr. KILER. There is one statement that has been made which to you who are charged with the duty of administering workmen's compensation laws doubtless is very familiar, but not to one who is engaged in industrial work as I am. I had no idea that the statement was true until I questioned Mr. Cole about it and he said that it was based on definite facts. That statement is that personal injuries alone resulting from material-handling accidents cost American industry and American employees about \$250,000,000 annually.

That is a tremendous figure—to me especially in industrial work—it hit me right between the eyes. If that is the cost of personal injuries alone and does not include the cost of damaged machinery, inefficient operation, curtailed production incident to injuries, and the like, I wonder what the real total is. It must be something tremendous.

In our work, which is the manufacture of explosives, the manufacture of heavy chemicals and naval stores (we are probably the world's largest producers of nitrocellulose products), we handle tremendous quantities of bulk materials—nitrate of soda and sulphur and other bulk materials. The gentleman who preceded me suggested the use of bins in the handling of bulk materials where possible, but I am quite certain that you can not handle a lot of chemical products, such as we handle, in bins.

I wonder if it might not be better in the handling of bulk materials to consider that they be handled in large quantities; that is, moved from shipboard, barges, or cars, by machinery, belt conveyors, air conveying systems, or something of that sort, into real bulk stor-

age, then taken out of that into small cars and moved directly into your process work.

That perhaps is a difference of opinion more than different definite results based upon experience such as you gentlemen have had.

There is one point of which I think Mr. Cole made a rather serious omission in his paper. He mentioned that where employees handling dusty articles, chemicals, acids, etc., are engaged, special types of goggles have been devised and forms of protective clothing are in use. In handling chemicals and dusty materials we have found masks to be absolutely indispensable. I do think that that should be brought out as a part of the discussion on Mr. Cole's paper.

We are called upon to handle rather bulky objects—to move them into buildings in which explosives are being manufactured—particularly to handle heavy lead tanks weighing 8 and 10 tons, in some cases more, to put them into a building in which nitroglycerin is being manufactured. We just do not have accidents in those buildings, because we can not. An accident in one of those buildings is a very serious thing. I wonder if, after all, that does not have a lot to do with the handling of many of these other bulky articles. When you are called upon to handle bulky material where you know a slip or fall will cause trouble, you will not have that slip or fall. That is all there is to it.

Another subject which the gentleman who preceded me raised is the subject of falls. We have quite a bit of construction work going on around our plants and one of my jobs is to look after it, not from the standpoint of safety, but rather from the engineering standpoint, the standpoint of construction and design. I have been engaged in engineering work for about 25 years and I have found that you have fewer falls with men handling materials if you do not ask the men to carry too much. For example, do not try to have two men carry an eight by eight, 15 or 20 feet long. Put four men on the job. Do not try to have one man carry three two by twelves, 16 feet long. Put more men under some of your heavy articles. Do not overload the individual himself.

There is one more point which Mr. Cole stressed in two or three places, namely, that those engaged in accident-prevention work have failed to approach the subject from an engineering standpoint or perhaps have failed to analyze their problems quite fully as they were engaged upon them.

We always talk of our own experiences—mine are in the design and construction of our plants—dealing with our own safety men and our own safety organization. My experience has been that it is a mighty hard job to get the safety man to come into the picture early enough in the design work. Mr. Shaw is here and may take exception to this statement that we are constantly trying to get our safety man into the picture in the design of our plants, even from the time that the basic thought of the change in process or the basic design of a new plant is conceived.

If we can get that safety man to sit alone with us, to talk and to go over the plans with us as they are being prepared, we can do a whole lot toward overcoming a lot of conditions which, when the plant has been built, have been found to be actual accident producers.

Chairman ROACH. Are there any questions to be asked, or is there discussion on any of the papers? If not, we will move on to the next paper, by Mr. Frank O'Connor, welfare superintendent of the dye works of the E. I. du Pont de Nemours & Co. (Inc.), Penns Grove, N. J., Is the Foreman the Key Man in Safety?

Is the Foreman the Key Man in Safety?

By FRANK O'CONNOR, *welfare superintendent of dye works, E. I. du Pont de Nemours & Co. (Inc.), Penns Grove, N. J.*

In attempting to answer satisfactorily to myself this question propounded in the problem before us, I found it necessary to go back and review the story of American industry, and in that review I found exactly what many others had already discovered; namely, that prior to 1898 there had been little or no change in the method of conducting business. Under the older scheme of doing business, when a large part of American industry was in the hands of partnerships or of individual owners, the dominant figure about the factory was the owner himself. He did all of the buying, most of the planning, much of the layout work, concerned himself with the hiring and discharging, was his own paymaster, wrote his own advertisements, and did not hesitate at any time to give orders to his employees.

During that time organized employees were considered a menace, welfare was plain charity, safety an unborn baby, compensation a dream of the distant future, and the foreman an undeveloped buffer between the men and the boss.

However, as American business grew and expanded through consolidations and combinations and became big business, this great individual personality of the older day was graduated into corporate management or easily faded from the picture in so far as actual participation in the work was concerned. Clearly defined organization took his place in which responsibility was unmistakably established and authority commensurate with that responsibility was given.

There had to be in this new scheme of organization a position, a job, an individual to whom the management could toss off its orders and know that those orders would be filled, and to whom the men could look. He could not be of the management. He must have been at least of the men. This was the foreman, and his job has continued to grow in importance. No longer is he the man handling a few laborers or mechanics in a yard or shop, lending a hand here or there sometimes, running the time book, doing part of the routine work, sometimes repairing broken-down machinery, continually dwarfed by the driving personality of the big boss and in many instances fearful of him, but to-day he is that man selected from among his fellows for his knowledge of the job, for his qualities of leadership, for his executive ability—those attributes that go to make his selection as foreman easily foreseen.

During the war period when money was plentiful and factories were running day and night, the activities of the foreman were confined almost entirely to getting out the work. There were in the plants fire chiefs, safety engineers, efficiency experts, compensation

clerks, welfare superintendents, and a host of others to look after the phases of service, but when business adjusted itself to peace-time conditions, retrenchments were necessary and many of the luxurious appendages were swept away. Right here the foreman came into his own. He became the key man of industry.

Formerly he was responsible for production alone. To-day he is responsible for every single relationship that exists between employer and employee. He is that point of direct contact between ownership or plant management on the one hand and the operating forces on the other. He is that lever which the management uses in times of intensive competition for increased production, to the end that larger contracts may be secured or new business gotten from the field.

To absorb the human shocks attendant upon modern management, to interpret intelligently its purposes, to clarify and enlarge upon its methods to the men working under him, to sense and translate accurately the attitudes of his men, and to present them faithfully to the management—these are the new responsibilities that have made of foremanship a new and important function of management. Only by the development and constant exercise of this function on the part of the foreman can the objective of complete and continuous cooperation in industry be reached.

However, business corporations are organized, factories are built, men are employed for the distinct purpose of creating greater industrial wealth and of making reasonable financial returns to the men who have invested their money in the enterprise. Therefore, production is the primary essential of both management and foremanship. And what is production? Quality and quantity, workmanship, accurate layout work with the minimum of wastage of raw material, low costs, merchandise manufactured and finished at a profit, delivery within the promised dates, and a common-sense regard for the physical upkeep of the plant and its equipment and for the safety and health of all the employees. To-day this safety and health of all the employees is woven into production just as much as low costs, reduction of overhead, accurate timekeeping, layout work, or the estimation of jobs.

One of the active vice presidents of the Du Pont Co. has stated that the most forward step taken in the safety movement of the company was when safety was incorporated as a part of management responsibility. The foreman is not alone responsible for getting out the required tonnage but he is also responsible for getting it out safely.

The foreman himself has been trained in the dangers of his electrical equipment, in State regulations of elevator operation, in plant transportation for getting his raw materials to his buildings and his finished products taken away, in cost analysis, in reading blueprints and making sketches, in establishing contacts with the employment office so that he may get the best men for his particular work, in making out reports, and in a working knowledge of fire extinguishers and sprinkler equipment. He has learned the value of housekeeping.

If he has stored up this reservoir of knowledge of all these phases of his job, is it beyond the bounds of reason for him to acquire the same knowledge about safety? He has received this education from

contact with chemists, engineers, and other technical men, and from the accumulated experience in years of working. Because his superintendent leans on him for results, so too, must he in turn lean upon his men and the standard of his success will be measured by the amount of training and education he has transmitted to his men.

If he is the key man in industry, he is the key man in safety, for safety is tied into the basic fundamentals of industry. As he works among his gang he is in a position to detect the unsafe practices of men lacing or putting on belts while the machinery is in motion; of men not using goggles in operations dangerous to the eyes; of men wearing flowing neckties or ragged clothing; of men using broken tools; of men **not** flagging crossings; of men climbing between freight cars; of men generating inordinate speed in transportation; of men climbing fences for short cuts; of men using fire appliances for purposes foreign to their intended purposes; and the unsafe conditions of slippery floors, of protruding setscrews on revolving shafting, of blocked fire escapes, of filthy wash rooms, of missing toe boards, of inoperative elevator gates, of defective handrails, of up-turned nails, of unguarded machinery. He must give the men safety education.

I would go one step further and say that if anything should arise in the progress of industry that we can not see at the present time, the foreman must meet that situation and must make himself a part of it. For instance, if there were no police department in a factory and suddenly men's luncheons were being stolen, electric lights were being removed from their sockets, finished articles, attractive in their nature like flashlights, revolvers, tools, etc., were being surreptitiously removed from the plant, I would say that the foreman in whose department this petty thievery was going on must convert himself overnight into a detective and stop that thievery. Further, if a company that had no insurance or no relief association suddenly determined to put into effect a group insurance plan or to establish a contributory relief association, the foreman must immediately convert himself into an insurance agent, because it is to him that the men will come to find out the cost of the insurance, the amount of the premiums, and the benefits that are going to accrue to them. He must follow up that insurance plan for his own men so that they will keep up their premiums, and get the medical certificates in on time so that they will lose none of the insurance benefits due them from the plan.

Before I came into the room I was asked just to what extent foremanship extended, whether it applied to all work. All work of any kind is industry; and I believe that a foreman might easily be the cashier of a bank, the principal of a grammar school, the sergeant of a police department, the conductor of a railroad train, the lieutenant in a firehouse, the head nurse in a hospital, the buyer in a department store, or a hundred others who we do not ordinarily associate with factories and with industry in its everyday accepted sense.

I am not sure whether you get very clearly just what I am driving at, but this morning I found a concrete example of what I have been trying to get together for the last few days.

This building in which you are meeting is a massive structure. It has in it a bank and 10 stores, a theater of 1,235 capacity, a hotel

of 264 rooms, and exactly 1,450 offices. And to-day they are building a mammoth addition to the building. On the construction of this addition there are exactly 27 contractors engaged in the work, who have 390 men working for them. They come from different States and widely scattered cities, and in that force of 390 men there is not a single architect, not a single engineer, not a single scientifically educated man. In plain English this building is being constructed by 27 foremen, and as these foremen left their respective cities they gathered together at the railroad stations the nuclei of their present working gangs. They bought the transportation for those men. When they arrived in Wilmington they saw that the men were properly housed; they insured the men under the Delaware law, if it were advisable; they have seen to it that the men are working under local construction ordinances and laws; and they have gone bail, perhaps, when the men were arrested. They are also responsible for getting the maximum amount of work out of everyone engaged on this addition.

If they are responsible to their employers for the transportation, the welfare, and the productivity of these gangs, I say that they are equally responsible to their employers and to the families of these men for these men's safety. The foreman is the key man of safety.

DISCUSSION

Chairman ROACH. Mr. Walter Dent Smith will discuss the paper by Mr. O'Connor.

Mr. SMITH (Delaware). Undoubtedly the most frequently appearing subject on any industrial safety program is that subject so well covered by Mr. O'Connor's paper. In his analysis of industrial history and in his local illustration as well, he has clearly shown that the foreman is the pivot or primary man in all industrial problems, including the problem of safety.

There are, however, two interpretations of the expression "key man," and I think it might be well to review briefly the differences. One definition of a key is that which serves to solve or explain; another is that which affords entrance or control. I think Mr. O'Connor in his paper has clearly shown that in the first interpretation, that which serves to solve or explain, the foreman is the man we are looking for to achieve industrial safety. Under the other interpretation, that which affords entrance or control, I think we must go back of the foreman to the plant manager or owner.

I bring this point out particularly because those of us who are actively engaged in safety work realize very keenly and have every evidence to back our realization, that the first essential to the production of safety in any industrial plant is the winning of the plant manager or owner over to the cause of safety. Without this, the foreman is handicapped to a great extent, because certainly in the first stages of his attempts to achieve industrial safety on his operation, he will find certain items requiring physical safeguarding and the expenditure of funds which he is not in a position to authorize without the manager's consent.

The second point I wish to emphasize is that assigning to the foreman the job of producing safety in his area per se will not

ordinarily bring the desired results. Frequently you will find a foreman who is sufficiently interested in the welfare of his fellow employees or sufficiently intelligent to put over the safety part of his job single-handed, but ordinarily the foreman must be trained for safety as well as for the other objectives desired by the plant management.

I know it was not Mr. O'Connor's intention to cover this necessary item in the safety program, and I want merely to refer to the fact that foremen's meetings where safety training has been emphasized have been eminently successful. The Metropolitan Life Insurance Co. recently published a booklet showing just how successful this training had been by reference to lowered frequency and severity rates following foremen's meetings. The Delaware Safety Council has been particularly successful in this type of work. For a period of 10 years foremen's safety schools have been held locally. These schools deal with such subjects as:

- A. Who pays for industrial accidents?
 1. The ultimate consumer?
 2. The fellow employee?
 3. The employer?
 4. The injured?
- B. Who controls accident prevention?
 1. The employer?
 2. The safety engineer?
 3. The foreman?
 4. The employees?
- C. What to do for—
 1. New employees.
 2. Poor employee discipline.
 3. Poor plant housekeeping.
 4. Infection epidemics.
 5. Insufficient employee safety interest.
- D. A cross-section of experiences on "How we obtained safety," by successful safety leaders in various plants.

Mr. O'Connor has very aptly said, "To-day he [the foreman] is responsible for every single relationship that exists between employer and employee." As a practical consideration, however, we must not expect him to produce maximum results without first assuring managerial support and without providing the necessary safety training.

Chairman ROACH. Our next discussion was to have been given by Mr. Will J. French, chairman of the California Industrial Accident Commission. Mr. French, unfortunately, has been unable to attend.

Secretary STEWART. His discussion has been received and pre-printed and I ask permission to put it into the record unread.

Mr. FRENCH (California). The foreman may or may not be the key man to safety. It all depends on circumstances, like so many other things. If the "set-up" is right, he can lead in preventing accidents. If it is otherwise, he falls back in the procession, perhaps a long way, and he may not be responsible for his unfortunate location.

We have read many times about the foreman and the key that is supposed to be in his possession. In fact, the expression has become a slogan in safety ranks, and analysis is required if we are to find out all about the situation.

Slogans not always what they seem to be.

Slogans are apt to become pests. Easily passed from mouth to mouth, attractive to the eye and pleasing to the ear, the slogan promoter tills fertile soil. He may be a governor elected on a slogan of "economy." If successful, his usual practice is to slash established appropriations without in any way reducing taxes. Many a fine department has been crippled. Additional costs have been added to the burdens of cities and counties. Lives have been lost, less aid given to the unfortunate, and the whole process of government as a medium of service has been abandoned.

The girl who does something that necessitates the front page is invariably "pretty." She herself would deny the soft impeachment. The reporter who has to cover a story writes about "the colorful scene," and generally it is as drab as rain on the desert.

So these comments have to open with a protest against the oft-repeated slogan that "the foreman is the key man to safety."

Foreman must have higher help.

If the foreman is supported to the fullest extent by his superiors in office, especially by the employer, and if his requests for money and equipment to make places of employment safe are allowed, then he should take first place. If he does not, then another foreman is the real protective device for the safety of the men under him.

If the foreman is hurried and handicapped, is told to take chances, is refused help in the safety campaign, and is continually warned that cost must be the first consideration and that life protection calls for money, he is in a desperate status. His key locks the front door against all that makes safety possible. He is obliged to work with the imps of carelessness and negligence. He knows human beings will be sacrificed, that men will fall or injure themselves in the pace that is set, and all he can do to offset the evil of his surroundings is to quit. But this will probably do no good, for another foreman is waiting to step into his shoes.

The real key man is the employer. If he insists, if he organizes for safety, if he gives those instructions that leave no doubt in any man's mind and then follows them up to see that everything is done, the executives under him have no escape, and the good word permeates in all places where there is a single mechanic or employee. No other force is so dominant. The "boss" has spoken. His word is known to be his bond. Each superintendent and foreman must follow the lead, for it is realized the least failure will not be tolerated.

Powerful safety forces rest in foreman.

The foreman, under favorable surroundings, holds a tremendously important place in the safety gamut. He is closer to the men. His supervision and contacts give him opportunities that no other official has. His keen eye can detect the unsafe way or the missing goggles or the violated rule. If he is stern and yet kindly in doing his duty,

he will get results. His lead must be the object lesson, for employer and superintendent are likely to be away on other duties.

Just as soon as the men know the foreman is "sold" to safety, and that it is useless to slight or take risks, then the example dominates all in the ranks. Men want to keep their jobs. They begin to appreciate the watchful eye for their welfare. The occasional accident has been brought home in several ways by the alert foreman. He pictures the possibilities and the consequences, if care is cast aside.

Discipline is the first aid to the foreman's key. Loud talking commonly means nothing and will retard accident prevention. Men soon glimpse the false note. If they discover that nothing happens and that they are free to do as they like, there comes into the industrial operations a laxity so much to be avoided if safety is to reign supreme.

A foreman who is responsible and responsive, who studies safety, who learns the laws and rules governing the work under his direction, who insists with the right measure of firmness, who sells safety to his associates because it is well worth selling, and who has the wholehearted support of his "boss," possesses a key that is relatively as large as his employer's key, and one that can open more doors to safety, because there are a larger number of doors available.

Foremen need continual training.

Like all other men with definite and important tasks, the competent plant safety engineer will see that the foremen are taught their relationships to safety. Some men must have this tuition, regardless of the positions they hold. Other men, perhaps, can get along without instruction, but no harm is done if their fund of knowledge is augmented. "Instructions to foremen" can be printed, meetings held, technical methods discussed, problems considered, the new employee given proper guidance, tools, and equipment adequately inspected, cooperation and friendliness furthered, and the non-English speaking man directed into the paths of Americanization.

The "rush" that sometimes dominates foremen can easily be reflected in accident haste. Experience shows the value in the speed that is based in knowing what to do first, then taking all precautions, and finally realizing that there are better ways of turning out work than unnecessary physical exertion.

Teamwork, with the foreman in the center, can do more to prevent injuries than anything else. Educational aspects to be successful must have the aid of all workers in the plant, and this includes the employer, the apprentice, and all employees in between.

The foreman who imagines he is the fourth mate on a Mississippi River steamer, judging by his attitude toward his men, is likely to have long casualty lists. Each man likes to be treated as though he "belonged." This means that he prefers his name to a number, he appreciates ordinary courtesy, and he wants to be told what to do and how to do it.

A foreman should be taught the elementary methods of keeping accident statistics, so that he can ascertain where and how injuries occur. This is the best way to strive for the elimination of accidents. The records will give an impetus toward the reduction goal.

The final word.

The foreman is the main key man when he stands on absolutely sure safety ground. This ground must first be cultivated by the management, without thought of reasonable cost, and the foreman's real leadership supported to the fullest extent. Then will follow fewer industrial deaths and injuries, and true conservation will come into its own.

Chairman ROACH. We will pass on to the next paper, *How Can Statistics Be Made Helpful in Accident-Prevention Work*, by Mr. A. R. Lawrence, chairman of the New Jersey Compensation Rating and Inspection Bureau, of Newark.

How Can Statistics Be Made Helpful in Accident-Prevention Work

By A. R. LAWRENCE, *chairman Compensation Rating and Inspection Bureau of New Jersey*

It is a far cry to the day when the pioneer safety worker bewailed the practical absence of statistics of a character to guide him in his work. Prior to the advent of workmen's compensation laws the complaint appears to have been fairly well supported by conditions then existing. Since that time much progress has been effected and to-day there are available large bodies of statistical data of considerable accuracy and covering practically every phase of the accident problem. In respect to industrial accidents the subject has probably been given as much attention, and by as many parties at interest, as possibly any phase of the whole question of accidental injuries. At the present time it is distinctly encouraging to note that without disparaging the study of the industrial problem, there is a growing emphasis upon safety on the highway and in the home.

Many of the early objectives, having already reached the stage of practical accomplishment, tend to fade out from the view of the immediate problem, but may well be further considered in their relation to some of our present-day requirements. In the early days of workman's compensation the development and extension of this doctrine were impeded and delayed by the simple inertia of human thought and habit, by the deprecation of hazards engendered by familiarity of everyday contact and experience, combined with plain indifference and occasionally a genuine disregard of the well-being of one's fellows. Subsequently it appears that much the same set of factors have opposed the introduction of methods and equipment necessary to improve the physical safety of the worker. There have been individuals and organizations which have required convincing evidence that a real problem existed. Without such conviction it was difficult to secure an organization, funds, and requisite authority to establish the proper policing of a State's industries in order that a reasonable standard of physical safety might be assured. The development of a conscious need for such facilities may be attributed to a clear conviction of the urgency and magnitude of the problem.

To the extent that early objectives have been realized, a considerable measure of credit may justly be ascribed to statistical presenta-

tions. For this purpose mass statistics have usually been sufficient. Before the days of compensation such reports as were usually published were simple in form and limited of content, and generally had a most restricted circulation and limited publicity value. Under compensation each injury immediately took on a definite monetary value and it became possible to demonstrate to the industries at least the direct cost of their accidents, and the reports of the administrative bodies developed a new interest and value for purposes of publicity and have been given rather wide circulation by the general press.

It may then be stated that accident statistics have played a definite part in molding the public conscience and the consequent direction of legislation. There seems little doubt that much remains to be done and should be done so that the industries and the public may be kept sufficiently informed, and correctly informed, as to present conditions. We are here confronted with the absolute necessity for equal emphasis and frankness for unfavorable developments as for the evidence of positive accomplishment. It is even probable that more immediate and effective support will be called forth by adverse reports than by a show of material progress. Man has seldom failed to rise to an emergency. Many well-conceived safety programs have been wrecked by overconfidence based upon early showings.

With physical conditions developed to a satisfactory standard it soon became apparent that the human element is in all respects a more potent factor than the mechanical one in the control of accidents. If this dictum has been questioned in the past, I take it that the truth of the statement will no longer be disputed. Be it noted that the term "human element" is not limited to the individual worker, nor to the foreman in immediate charge, nor yet to the executive, but must necessarily include all of these. What is required, then, to attain an effective measure of accident control is education as to the scope and magnitude of the problem, translated into a concrete program and executed and supported with the cooperation—genuinely interested and intelligently applied—on the part of all concerned.

In the main all human accomplishments must be measured in terms of relative standards. An absolute or quantitative measure will not generally yield a useful result. If comparison be odious, then I suggest that such odium be turned to a useful purpose in the accident-prevention field by applying a suitable yardstick to the accident-performance records of the various units of industry. May we not as well concede that the "elimination" of accidents is beyond any reasonable hope of accomplishment and adjust our outlook to the reduction in the severity and frequency rate? Such an objective would seem to be a reasonable one, both for the supervisory authority and for the plant executive. We may then consider what kind of test or measurement may be of service in stimulating or directing accident-prevention efforts.

A useful comparison is one which fairly and accurately contrasts the frequency and severity rates of a given plant with another concern in the same class of industry. It should also develop a con-

tinuing record of the accident rate in the same plant so as clearly to bring out the trend of recent performances by reference to the record of earlier periods. Where the units of industry are sufficiently large, it will often be possible similarly to contrast the performance of major divisions of a single plant or establishment. With sufficient care in the selection and grouping of the units, similar comparisons may frequently be made to advantage as between different concerns not so closely related as to be competitors in the ordinary trade sense.

Such a form of checking would seem to be attractive to the authority administering the labor law. It would tend to concentrate attention upon those plants or industries most in need of study. With the same funds and personnel there might be a lessening of routine inspection and more intensive application to conditions demonstrating the need for radical correction. In other words, it would make for economy of effort and the probability of greater return. It would also lend added support to the authorities in those few cases where reason fails and recourse must be had to legal proceedings. It should also appeal to the industrial executive on a number of counts. At the outset it would show concretely the relative seriousness of his own problem and would keep him posted from time to time as to his own progress and that of related plants. Similarly applied to departments or divisions within the plant, it should lead to conservation of effort and to the localization and the intensive study of specific departments or processes in which the accident rates stand out unfavorably.

Many an executive, lukewarm to the problem of safety, becomes a quick convert when he discovers that his own plant shows up unfavorably when his accident record is compared with others. It is not so very remarkable that both the executive and minor supervisors, and, perhaps, the individual workman as well, being thoroughly at home amid the surroundings of their plant, become reconciled to the hazards which exist and accept the same as representing a reasonable standard of practice. Unless most closely scrutinized, individual accidents tend to appear largely fortuitous, and, perhaps, a large measure of the apparent blame seemingly attaches to the person injured. Where a feeling of complacency exists, additional physical safeguards are of little consequence and the expenditure of large sums of money for plant betterment will probably have little or no effect upon the inherent safety of operations. This condition can only be corrected by demonstrating to men and to management that they are laggards in the contest, and this being established, the internal organization of the plant may generally be relied upon to find ways and means of lifting itself out of the rut. My contention is that comparison of accident rates is the most potent influence available for stimulating the interest of an employer who seems to be genuinely unaware that his plant presents a real accident problem.

Such a comparison must be accurate and must be fair to the industry and to the employer. In the development of statistics for this purpose it is obvious that the measurement of exposures plays

a prominent part, and there must be a close correlation of accident data and exposure data for the same period of time, since the effort is made to compare the rate of accident rather than the absolute number or their gross monetary cost. The assumption of an average exposure or any other short-cut device, will not serve the purpose. In the long run and over a sufficiently large exposure monetary cost may be a reasonable measure for the simple study of accident trend in a given plant. If it is desired to escape the occasional distortion which may result from monetary values existing tables for severity weighting are quite satisfactory. Whatever method be adopted to measure the composite effect of frequency and severity, must, in fairness, be predicated against the involved exposure. Whether this be measured in terms of wages or of man-hours of exposure is also immaterial, provided the standard used is capable of general adoption and uniform recording and report. While the man-hour unit is more fundamentally correct, it is frequently not ascertainable from primary records, but can be developed from a wage total divided by an average wage, and this last figure may or may not be accurate. Since our comparisons will usually be desired as between different plants in the same industry, it is probable that the average wage prevailing is stable enough among the several plants to make direct comparison on a wage basis quite accurate and thoroughly fair. To a very considerable extent it is probable that the data necessary for such a program already exists or may be prepared with little additional effort.

Again, it appears that some of the systems of industrial classification in use do not group related industries with a sufficient degree of refinement or homogeneity of operation to produce a proper comparison of similar hazards. The system of industrial classification employed in the compensation insurance rate manual tends toward an opposite extreme. This is, of course, an instrument for underwriting purposes, and not all of the seven hundred and odd industrial classifications represent different hazard groupings or accident severity rates. To illustrate: Under the first point, a single classification, "Paper box manufacturing," as in some of the industrial codes, is probably too condensed, since carefully compiled insurance statistics disclose a composite frequency and severity rate 50 per cent and more higher in the hazard cost of folding paper box and corrugated container manufacture than for the solid-stayed paper box. On the other hand, planing mills, carpenter shop, and sash, door and millwork manufacturers, as in the rate manual, constitute probably a single hazard group, notwithstanding that the existence of three separate classifications may be justified for underwriting purposes.

Just as the accident rates of a whole State's industries may be combed over to pick out those plants presenting the greatest problem, so it should be possible to subdivide and analyze the performance of the several departments within a given establishment. Statistics for this purpose would not usually be available to, or at least compiled by, the administrative authorities, but would be developed individually by the plants themselves. Such studies will greatly aid the plant supervisor or engineer in determining where his efforts

can be expended to best advantage and may help to bring out weak spots within the internal organization. By the use of bulletin boards and the posting of the performance record of the plant as a whole and of its various subdivisions, a good deal of effective and friendly rivalry can be developed, which is frequently of material aid in cutting down the accident rate. If such internal publicity is not employed at all times, it can be brought out or revived in connection with community or state-wide interplant safety contests, or similar efforts within a particular industry.

It is, perhaps, well to give some passing thought to the limitation of statistics in their relation to the accident problem. Our present concern is clearly to derive the maximum advantage and use in attacking the problem of accident control. Statistics as an end in themselves need give us very little concern, and the reports of aggregate figures may be dismissed as being of little practical aid. Meanwhile the problem grows upon us, and is constantly shifting in character. The past 10 years have marked probably the most intensive period of industrial "speeding up" ever known. The introduction of new processes and elimination of old ones and the substitution of mechanical for manual operations may either increase or diminish the hazard or change its character or location. It is primarily the function of the engineer to ascertain the cause of trouble and develop means for its elimination. The engineer, however, must be kept intelligently informed. He may use his imagination and must be ever on the alert, but he can not be in all places at all times. It is the prime function of statistics that he shall be kept accurately informed and this information kept up to date so that his efforts may yield a maximum return.

May I therefore suggest in closing, in order to produce the greatest return and to be serviceable to all parties at interest, that statistics must be (1) accurate and complete and be closely correlated to the item of exposure, and, so far as possible, standardized, (2) that comparative studies and comparative data are of the greatest possible value in the attack of the accident problem from whatever point of view, and (3) that statistics alone will not solve our accident problem but do constitute an indispensable link in the process by which our reasonable expectation may be realized.

Chairman ROACH. Mr. W. J. Maguire, of the Department of Labor and Industry of Pennsylvania, will discuss *How Can Statistics Be Made More Helpful in Accident Prevention Work?*

How Can Statistics Be Made More Helpful in Accident-Prevention Work?

By WILLIAM J. MAGUIRE, *director Bureau of Statistics, Department of Labor and Industry of Pennsylvania*

Pennsylvania staged an industrial safety campaign in 1929. Carefully devised plans for a concerted safety effort were formulated during the late months of 1928. The campaign was launched auspiciously on January 1, 1929, and was carried on with unabating

vigor throughout the entire year. I am not going to tell you the history or result of that campaign. It will be sufficient to say that while the campaign resulted in no appreciable reduction in industrial accident totals for that year, industry was so impressed by the progress in safety education during the campaign, and by the advancement in accident prevention, that a conference of industrial safety engineers, representatives of organized labor, branch safety councils, and civic organizations held in November, 1929, gave hearty approval of the campaign, urged the department to continue its program for a 5-year period, and advocated the extension of the campaign to include the safety activities in all industries, on the streets and highways, and in the homes. The recommendations of the conference were accepted by the department; and beginning this year, 1930, eight departments of the Pennsylvania State government—the departments of education, health, highways, labor and industry, mines, and welfare, the public service commission, and the bureau of motor vehicles of the department of revenue—are actively participating in an effort to eliminate accidents and to implant in the consciousness of all people of the Commonwealth an alert safety sense that will continue throughout life.

My object in mentioning the Pennsylvania safety campaign is that I know of no better method of discussing the use of statistics in accident prevention than to explain the helpful use we made of accident statistics in the promotion and direction of the accident-prevention campaign.

In laying the groundwork for that campaign it was foreseen that if the plan of block or sectional inspection work were continued during the period of the campaign much of the inspectors' time would be taken up with routine inspections, when it might much more profitably be concentrated in eliminating accident hazards in plants which were prolific sources of accidents. The question which immediately presented itself was, "How can the identity of these plants having bad accident experiences be determined?" Various plans of obtaining these data were considered. The first method suggested was to make copies of the original accident reports submitted from employers. While this method has the advantage of providing complete information on each accident case, the amount of typing involved in making duplicate copies of the eight to ten thousand accident reports submitted each month was considered to be out of proportion to the value of the records obtained, particularly in the case of minor accidents. The second method considered was to have employers submit accident reports in duplicate. To do this, however, would have necessitated an amendment to our accident-reporting law, and it is doubtful whether an amendment of this nature would be enacted by the legislature. The third method and the one selected was to compile these accident experiences from the tabulating card record made in each accident case. In the development of this method it was necessary to assign code numbers for the identification of each industrial establishment in the State. There was available no complete and up-to-date list of industrial establishments. In order to provide this essential list the files of the bureau of workmen's com-

compensation were examined, and the name and address of each establishment reporting an accident during the year 1928 were recorded. The names obtained in this preliminary list were afterwards supplemented by names secured from the insurance coverage cards furnished to the department by the Pennsylvania Compensation Rating and Inspection Bureau and also by names secured from industrial directories, telephone directories, Dun's reports, and from various other sources. This coding list of industrial establishments now includes the names of more than 26,000 firms operating in the State. The list is not by any means complete, but additions, revisions, and corrections are being made constantly. We now are able to report monthly to the bureau of inspection accident totals for individual concerns which comprise approximately 80 per cent of the total number of accidents reported from industry each month. Of course, it should be possible to secure the accident experience by individual employer for the entire total of accidents reported from industry each month, but in order to do this an interruption of established procedure in the department is introduced which seems inadvisable at this time.

The method of procedure followed in the tabulation of these records is to assign individual code numbers as established by the coding list to each accident report when such report is first received at the department. This assignment of code numbers is made in the indexing division of the bureau of workmen's compensation where accident reports are received. Then, when the tabulating cards are transmitted to the bureau of statistics each month, they carry a code number corresponding to the code numbers established for each employer on the index list maintained in the indexing division of the bureau of workmen's compensation. Incidentally, these code numbers are arranged by county divisions and not in a straight alphabetical list for the State. In other words, we have 67 alphabetical lists comprising the coding index instead of 1. The primary advantage of this arrangement is that it facilitates the tabulation of the data according to inspection districts, provided, of course, that the inspection districts are composed of whole county divisions. If they are not, a predetermined key number for each district becomes an essential part of the company code number. A second advantage of the arrangement of this coding list by county divisions is that the county in which the plant of the employer is located is reported on the original accident report, and the coding clerk can immediately refer to the index for the county named and assign the proper code number for that employer in that particular county. This facilitates the coding work considerably since an alphabetical list for an individual county is very much smaller than a single alphabetical list of establishments for the entire State. Incidentally this alphabetical arrangement by county also provides a very effective means of checking errors in the assignment of code numbers.

The tabulating cards of accident cases are sorted each month according to individual company code number, and the total of accidents for each concern run off on a tabulating machine of the printer tabulator type. The record comprises the individual code number

for each company and the total of fatal and nonfatal accidents reported.

These tabulations are made on report Form S-22 (Exhibit A). Four copies of this report are made—one, separated according to the counties included in the various inspection divisions, for transmission to the nine supervising inspection offices in the State; a copy for the use of the director of the bureau of inspection; a copy for the files of the bureau of statistics; and a copy for the use of the bureau of industrial standards in making special studies and analyses of accident records for selected groups of establishments.

Exhibit A

Accident report by individual employer¹

Form S-22

Month..... Year..... County.

Name of employer	Location of plant		Employers' code number	Number of accidents	
	Street and number	City or town		Fatal	Nonfatal
.....
.....
.....
.....
.....

¹ Includes the record of reports of all fatal and all nonfatal accidents of two or more days' disability that were received at the bureau of workmen's compensation during the period indicated.

This form, S-22, carries a space for the name and address of the establishment for which the accident experience is reported. After the reports come from the printer tabulator, they are given to a clerk who decodes the name and address of the individual establishment. This decoding work is performed in the bureau of statistics because of the convenience of using the clerical help available at the central office rather than leaving it to the district offices, although our plan is so worked out that it may be done at either place.

For each establishment whose name appears on the coding list in the bureau of workmen's compensation at Harrisburg a card, Form I-31 (Exhibit B), is prepared for files maintained in each of the nine district inspection offices of the bureau of inspection; and the accident totals reported each month are entered on the I-31 accident record cards. In this manner each supervising inspector is in possession of a running record of the accident experience of nearly all establishments in his division.

Exhibit B

Form I-31

Name of employer	Street and number	City or town	Code number
Inspection Division		County	

Month	1928		1929		1930		1931		1932		1933	
	Fatal	Nonfatal										
Jan.....												
Feb.....												
Mar.....												
Apr.....												
May.....												
June.....												
July.....												
Aug.....												
Sept.....												
Oct.....												
Nov.....												
Dec.....												
Total.....												
Inc. (+).....												
Dec. (-).....												

In addition to these two forms of records, the bureau of statistics also maintains a running record of the accident experience for all establishments on a card which also serves as a guide card for our tabulating card file. The accident experience for each establishment is posted each month on a card similar to Exhibit C, so that at any time the supervising inspectors are able to check totals for individual companies with the records maintained in our bureau.

This card also provides the bureau of statistics with the means of furnishing an immediate record of accidents for any given establishment whose name appears on the coding list, and as I have stated there are more than 26,000 of these. In the upper right-hand corner of the tabulating guide card there is space set off by a double vertical line. This space is provided for the recording of the average number of workers employed by each concern. This record of employment is obtained from any available source and accordingly is not always a true record for the current year, but it does give some idea as to the exposure represented by the accident figures tabulated for each company. We hope in time to be able to secure the man-hour exposure for each concern, but as you are well aware the possibility of securing complete man-hour exposure records on a state-wide basis is not within the realm of immediate possibilities.

Exhibit C

Month	1928		1929		1930		1931		1932		1933	
	Fatal	Nonfatal										
Jan.....												
Feb.....												
Mar.....												
Apr.....												
May.....												
June.....												
July.....												
Aug.....												
Sept.....												
Oct.....												
Nov.....												
Dec.....												
Total..												
Inc. (+).												
Dec. (-).												

With this, as with all reporting services of this kind, there are some difficulties to be overcome. Some confusion is occasioned by the fact that our records are tabulated on the basis of the time when accident reports are received, whereas, the records maintained by individual companies usually are on the basis of the time when accidents actually occur. Then too, the assignment of incorrect code numbers causes some difficulty, but on the whole the system has operated to a fair degree of satisfaction to all concerned and has proved its worth. The inspectors in the field repeatedly inform us that employers are agreeably surprised to learn that the State is taking such a definite interest in the accident experience of their concerns; and the inspector having this factual record of accidents to guide him is in a much more favorable position to examine and investigate accident hazards in the establishment than he would be if he had no knowledge of the actual accident experience of the concern he is inspecting. The general consensus is that the plan has aroused a spirit of interest in accident records among a large group of establishments which heretofore had given little or no thought to their accident experience. The director of the bureau of inspection of the department is convinced that this plan of directing inspection work on the basis of accident experience is a step in the right direction, and we expect to continue the system indefinitely. Improvements to an extension of the system will be made as rapidly as feasible.

Right here I wish to state that in describing the Pennsylvania plan of tabulating current data of the accident experience in individual industrial establishments I do not claim by any means that we have hit

upon the best possible system. Possibly some modification or change in our present methods would produce better results. Our experience during the year and nine months that this system of compiling the accident experience of individual establishments has been operating has indicated that it might be advisable to supplement the bare accident totals which we furnish to the supervising inspectors with a brief report of the essential facts given on each individual case, but we are not in a position to extend our work in that direction at this time. We are satisfied that the value of obtaining these current records of the accident experience in individual plants is well worth the money and effort expended. And the set-up of the system is not particularly costly. Aside from the original cost of providing a rotary index file, index cards, and additional filing equipment for tabulating cards, the only additional cost is the salaries of three clerks needed to carry on the work—one clerk to assign company code numbers to accident reports, one to decode the tabulated totals and type the monthly reports, and a third to look after additions, changes, and corrections of the list of establishments used for coding purposes. The cost of the system naturally will vary according to the size and industrial importance of the various States. In some of the smaller industrial States the entire project probably could be handled by one clerk.

This explains in some detail the most important new use of accident statistics which has been made in Pennsylvania in recent years. Call it accident accounting or bookkeeping if you will, nevertheless it constitutes a very practical and effective use of accident information which is producing satisfactory results in accident-prevention work. Dr. L. W. Chaney, of the United States Bureau of Labor Statistics, can attest to the value of these records. In gathering the annual accident experience for the Pennsylvania concerns used in his survey of industrial accidents in the United States, he can be furnished by means of our new method with complete records within a day or two; whereas formerly only incomplete data for a limited number of concerns could be furnished and that only after much laborious effort in searching through original case records. Our files of tabulating card records provide the material from which a rather detailed report of the accident experience of nearly any industrial concern in the State can be obtained upon relatively short notice. This is of immeasurable assistance in factory inspection and accident-prevention work.

My subject, "How can statistics be made more helpful in accident-prevention work?" perhaps called for a more complete and general review of the possibilities of using accident statistics effectively in accident prevention, but I have confined my discussion to an explanation of this new plan of compiling current records of the accident experience for individual industrial establishments because by the adoption of this plan it is felt that Pennsylvania has taken an important step forward in the accident-prevention movement.

DISCUSSION

Chairman ROACH. The discussion on this paper will be opened by Mr. Parke P. Deans, member of the Industrial Commission of Virginia.

Mr. DEANS (Virginia). Statistics prove that safety is practical. To any program of safety, statistics are essential. As Mr. Lawrence has just said, "With physical conditions developed to a satisfactory standard it soon became apparent that the human element is in all respects a more potent factor than the mechanical one in the control of accidents."

When comparative reports in industry show one plant better in "lost-time experience" than another, a competitive program for safety has begun. As said by Mr. Lawrence: "Many an executive, lukewarm to the problem of safety, becomes a quick convert when he discovers that his own plant shows up unfavorably when his accident record is compared with others."

The papers just read deserve our commendation. When we make a survey of the boards and commissions of the United States, we find a gross neglect in taking advantage of the "storehouses" of valuable information for the advancement of safety. I recently visited an industrial commission and found the floor space covered with filing cabinets. I asked, "What are you doing to compile statistics for safety?" The reply was, "Not anything." There slept information which was invaluable to the industries of the State. If this discussion this afternoon does but one thing, to wit, impress the importance of statistics upon the commissioners, so that they may return to their homes and begin this branch of work, then it was not in vain. It should be the duty of each State and Province to collect statistics for use.

Mr. Lawrence's paper brings home the importance of this work. Mr. Maguire has given us the "set up" of his department. These should be valuable alike to those who are just launching on this phase of work and to those whose departments are "running slow."

Both of the papers show you two definite results accomplished: First, that the employer is impressed with the State's interest and intelligent effort and is, consequently, more susceptible to an accident-prevention program; and second, the inspection departments are given better information as a basis for work. Either of these results makes the work worth while.

I believe I can say that we, in Virginia, are accomplishing the same results.

May I ask, what does it mean to the employer? Our commission makes direct contact with all employers in the manufacturing group at regular intervals through frequency reports. I brought with me a sample of one of these reports. This particular report was made to the furniture manufacturing group in Virginia. A copy was mailed to each of the 54 plants, the experience of which was included in the report.

This report gives the lost-time injury experiences of the furniture manufacturing industry for the period from January 1 to June 30, 1930. It shows the average number of employees engaged in the industry, the total number of hours worked, the number of lost-time injuries, and the frequency or the average number of lost-time injuries per million hours of work. It also gives the frequency for the corresponding period of 1929. In addition to giving the group frequency, the report includes the individual plant experience of 25 of the operations. In Mr. Maguire's paper, as I recall, it is stated that the Pennsylvania department does not have accurate informa-

tion on man-hours, which Mr. Maguire says he hopes in time to secure.

Mr. Lawrence says: "While the man-hour unit is more fundamentally correct, it is frequently not ascertainable from primary records, but can be developed from a wage total divided by an average wage, and this last figure may or may not be accurate."

In presenting the picture to the employer, we feel, man-hour data are very essential and in 1928 we, in Virginia, had our law changed to enable us to obtain this information from the employer.

A comparison of accident experience awakens the employer to a realization that his plant has a real accident problem.

What is the attitude of the employer toward work of this character? I will quote from letters we have received from some of them:

Certainly do appreciate the information you sent out and it makes a fellow want to try just a little harder.

We feel that your department is doing an excellent work particularly in cases such as ours, where enough attention has not been paid to accident prevention.

It gives us some very good information and just what we have been wanting.

We believe the work you are doing will be very beneficial to the industries of the State.

In reference to the second result, referred to by these gentlemen, to wit, affording a basis for inspection work by the proper authorities, may I emphasize the remarks of Mr. Lawrence when he said that statistics concentrate the attention of those who administer labor laws upon those plants or industries most in need of study. He rightly says that with the same fund and personnel there could be a lessening of routine inspection and more intensive application to conditions demonstrating the need for radical correction.

In Pennsylvania the inspection department is a part of its organization. The labor department is combined with the administration of the workmen's compensation act. In Virginia, inspection service is a part of the duties of the labor department—separate and distinct from its industrial commission. We work in accord. We furnish reports to the labor department of all mechanical lost-time injuries, giving the name and location of the plants, the nature and cause of the injury. With this information our labor department is helped in efficiently performing its duty in inspection work.

I believe these gentlemen have proved that statistics are helpful in accident-prevention work. I am confident that an interest toward accident prevention has been created in the mind of the employer which will pay big dividends. Statistics have molded interest in safety prevention which has brought about legislation. Therefore, may I urge you to establish in your respective jurisdictions a department to promulgate statistics. If you have not now the means, you should so exert yourself that your legislative bodies will make possible this work.

Chairman ROACH. Is there any further discussion of this paper?

Mr. MAGUIRE. I should like to enlarge on one point Mr. Deans has made, that in a number of States the industrial commissions and the labor departments are entirely separate organizations and the ease with which we have put this plan into operation possibly will

not prove so true in other States; however, I think it can be done. I also want to add that the ease with which it was done in Pennsylvania is due to the spirit of cooperation that has existed in the bureaus, especially the heads of the bureaus concerned, the bureau of inspection, the workmen's compensation board, and our own bureau of statistics.

Chairman ROACH. Do you have any trouble in getting prompt accident reports submitted to you?

Mr. MAGUIRE. Yes; we do. We have been studying that problem for the last several years and have made calculations and we find our average lapse of time in the reporting on an accident is 18 days. We have been sending letters annually to insurance carriers and employers in the State.

Chairman ROACH. I wish somebody would discuss that. It seems to me if we are to have substantial reports, we shall have to furnish the men in the field with a good bookkeeping account.

Mr. MAGUIRE. We do it once a month, instead of annually.

Mr. McSHANE. I do not know whether this is what you wanted discussed, but Mr. Deans struck upon a matter that is very close to my heart, which is, that we will never get any place or mean anything if we simply say we have 5,000 accidents in May and 7,000 in the month preceding, and therefore we had a reduction in the number of accidents.

It is a very simple matter, by setting up a proper statistical organization, as he says, to give information that is invaluable by way of comparison.

I hold a little sheet in my hand that gives the two years' experience, 1928 and 1929, for Utah. That sheet was struck off, just an hour before I left, from our records. It gives us the average number of employees, the man-hour exposure, pay roll, premiums paid to the stock companies, and premiums self-insurers would have paid had their risks been written at the State insurance fund rate. It also gives the number of fatal accidents, the cost per accident, with a split for medical and funeral, permanent partial and permanent total injuries; temporary injuries, with the average for each one for the two years. It shows the number of hours that a man may safely work in Utah, if he is an average man, without getting killed; the number of hours he can work without having an accident of any kind.

I find that that is of such value in comparison with other reports that we receive in our department that we simply could not get along without it.

Another thing I wish to say, if you will permit me just a moment, is to call attention to one of the factors by which men are gypped, either designedly or without design, out of their compensation. If you are going to have a waiting period at all, we have an ideal one in Utah—three days.

Chairman ROACH. For every accident?

Mr. McSHANE. For every accident there is a three-day waiting period. Now I am speaking of temporary injuries, and we lost in 1928, 109,059 days, and in 1929, 146,944 days due to temporary disability. During that 2-year period there were 29,801 temporary injuries.

Dr. MYERS (Illinois). I want to state that a brief but rather enlightening experience of statisticians in Illinois has convinced me that this problem of accident statistics is not only rather unsatisfactory, but that there is a great need for improvement. I should like to mention very briefly four points I think might be given attention in an attempt to increase the value of accident statistics for accident-prevention work.

The first is greater accuracy. Probably compensation work is done with considerable accuracy in most States, but I feel that in a great many States there is insufficient attention given to the original report, and that quite frequently the results are valueless or of much less value than they might otherwise be because of the fact that the original reports are not carefully scanned.

Another point that might very well be mentioned is the greater comparability of accident statistics. That is rather a sore point in Illinois. Statistics on a different basis every year are of little value. I think that statisticians should adopt a standardized system and follow it and not every year or every other year try to change the method in preparing accident statistics.

A third point I should like to mention briefly is the need for more accurate classification, which Doctor Patton mentioned briefly yesterday, and I am sure before the convention is concluded more will be said on the subject of more accurate classification—more complete interpretation and explanation of terms. Too often a statistical table is presented which means practically nothing, or, if it means anything at all, you can not tell what it means.

Another thing is greater detail. The accident statistics in many States to-day are so general it is almost impossible to attempt any very definite work through them. We are now making a study in Illinois of coal-mine accidents in the first six months of the present year (1930), in just that one industry, and we are classifying accidents according to occupations, cause, and location of injury. We have about 6,000 cases. We are working on that in cooperation with the Coal Operators' Labor Association in the State.

That study, which has been made in considerable detail, should show us in each coal mine and in coal mines generally throughout the State where the accidents occur, the type of accident, the cause thereof, and the occupation of the man who is injured. With statistics like that I feel definite safety work can be undertaken; with a general annual statement put out in most American States, I feel very definite work could be done.

The type of work of which I am speaking takes a great deal of time and a great deal of effort. You can not do it all at once. We are going to try to do it with the coal industry first and later take up other industries. The building industry is another one we want to take up, because it calls for immediate attention. I feel that in the last 10 years there has been a tremendous development in statistical work, and I know plans and systems have been discussed this afternoon which are resulting in accurate work and will in future result in still more accurate work; but I feel that accident statistics in general are not in any sense complete or satisfactory.

I think we need to give much more attention and a great deal more care to this phase of the work. Without careful statistics, you are going blindly in safety work, it seems to me, and while be see perhaps

vaguely in some States, in other States we are still almost entirely blind. I think in all American States we see through a glass darkly.

Mr. KEARNS (Ohio). We all realize, of course, the necessity and value of accident statistics in connection with accident-prevention work and the value of having man-hours for comparative purposes. In Ohio, like many of the other States of course, we have been unable to get thoroughly reliable figures on man-hours in industry, and, as a matter of information, I should like to ask the gentleman from Utah what number of risks or employers he has in the State of Utah, and how he gets the man-hour reports or records from the employers, or how they are collected.

Mr. McSHANE. Mr. Kearns is going to make me state that we are a little State industrially, but great in other things, and I invite him to come out and see for himself. We have only about 3,500 employers who come within the scope of the law. We have only 26 acres out of every 100 acres in the State of Utah that are privately owned and taxed. It is, therefore, more difficult for us to get money for gathering statistics than it is in Ohio, where every square foot is subject to tax; but we do this: An employer's report is required by law, under penalty, to be made annually, under oath, and among the information in that report is the man-hour exposure, and that report is made by classes. What I have given here in sum total can be given for every classification that is used in our State.

We realize that it is going to be difficult to get absolutely accurate statistics, but after 10 years' service in this work, I feel that the information received from our employers is substantially accurate and very satisfactory.

Chairman ROACH. Might I ask Mr. McShane as to about how many employees the statistics would cover?

Mr. McSHANE. They cover about 20,000 coming within the provisions of the act, as an average of the last 10 years.

Mr. KEARNS. It would be a much more difficult task in the industrial States, for instance, in Ohio, where we have from 50,000 to 60,000 risks, perhaps, and in New York with approximately 200,000 risks. It is a pretty big job and we would have to set up a pretty big department to collect them as they are collected in the smaller States like Utah.

Mr. McSHANE. That is true.

Chairman ROACH. If there is no further discussion on this, we will have the next paper, *State Experience in Controlling Premiums*, by Mr. Frank P. Evans, statistician of the Industrial Commission of Virginia.

State Experience in Controlling Premiums

By FRANK P. EVANS, *statistician Industrial Commission of Virginia*

In Virginia the payment of compensation is insured either through a carrier authorized to do business in the State or as a self-insurer under requirements of the industrial commission. In 1928 the general assembly amended the compensation act, looking to a closer supervision on the part of the State authorities in the regulation of

workmen's compensation insurance rates. This has occasioned the installation of a statistical plan for the industrial commission to check the loss figures used by the carrier companies in rate-making procedure. Since 1928 the industrial commission has also been called upon to furnish information as to the fairness, reasonableness, and adequacy of rates, and therefore premiums, proposed by carriers following the enactment of changed law benefits. My paper therefore will deal with the recent experience of the State in these two matters.

I will first take up our experience in determining the effect on rates of law benefit amendments. It is probable that some of you have followed the same procedure. In 1930 our general assembly and other interested parties desired to know from us the effect from a compensation cost standpoint of the enactment of certain bills then pending proposing increased compensation benefits. Our method of arriving at the situation was to take several years' experience under the Virginia law the recording of which had been done on Hollerith cards by individual cases. Using those cards, we developed a weekly wage table. This table split the claims by extent of injury into "fatals," "permanent injuries," and "temporary total injuries." In the table, under each of these heads, column 1 gave the weekly wage in even dollars, starting on line 1 with the group receiving less than \$10; line 2, \$10; line 3, \$11, etc. Column 2 gave the number of claims by weekly wage received, column 3 weekly wages received, column 4 weekly compensation awarded, column 5 total compensation awarded, column 6 weekly compensation which would be paid under the proposed legislation. For fatalities we also provided a column for burial allowances. From this table we readily figured the effect in per cent of change by the week or by total compensation dollars. In addition to the wage table we also used a duration table in order to determine the compensation involved in changing the waiting period.

To estimate the effect from a total cost standpoint it was of course necessary to relate the change in compensation figures or percentage to such total cost—that is, the compensation and the medical combined. This operation with us meant multiplying the total compensation awarded as shown in the table by the percentage of change shown in applying the law amendments and dividing the product by the total loss costs (compensation and medical). This necessitates having knowledge of total medical, which in our case is reported in detail as it is paid. We have on several occasions, after obtaining the compensation percentage of increase, used Schedule Z which is, as you know, a policy year experience and loss report by classifications, to arrive at the percentage of increase of total costs. The result checked in a satisfactory manner with the other method. Our method did not enable us to determine the effect from a cost standpoint of a change in our medical provision, to which I will refer later.

During 1930, subsequent to certain changes in our compensation law increasing the benefits, using chiefly the above method, we have made up an estimate of the effect of the law amendments on existing rates omitting a changed medical provision. Prior to the carrier's request for a rate revision, we informally conferred with the National Council on Workmen's Compensation Insurance, which

serves as a clearing house for the carriers, in certain rate matters. The council had made a study of the effect on rates resulting from the Virginia amendments using necessarily theoretical methods. In this particular instance their study indicated a result within one-tenth of 1 per cent of ours, excluding the new medical provision. On the effect from a cost standpoint of the change in our medical provision there appeared to be no accurate method of arriving at a definite conclusion. The council and we had a partial guide in the medical provisions of other States, but comparison of this kind was not conclusive and the council, in what appeared as a cooperative spirit, in some measure gave way to the judgment of the State. In the increase granted because of the law amendments, therefore, the State had its own source of first-hand information on which to base decision.

Next as to the experience of the State in determining the correctness of the losses which form the basis of Virginia rates.

The Virginia plan is a substitute for the former method of reporting by Schedule Z. Schedule Z as before stated is a carrier's policy year report for given States. The report includes by manual classifications total pay rolls, total premiums, and losses. The losses are divided into deaths, permanent totals, major permanent partials, minor permanent partials, temporary totals, and medical, the medical in turn showing separately the amount for compensable cases and noncompensable cases. Individual loss reports are also made for the fatal cases, permanent totals, major permanents, indeterminate cases, and other cases where the estimated cost equals or exceeds 50 weeks' indemnity at the maximum statutory rate. In Virginia prior to the 1928 policy year these Schedule Z reports were sent to our insurance bureau where the carrier's figures were combined by manual classification and forwarded to the national council for use in rate making.

Beginning with the report for the policy year 1928 Virginia is requiring the information to be submitted by each carrier in quite a different manner. Beginning with the policy year named reports must be filed with the industrial commission covering separately every workmen's compensation policy effective in Virginia.

Reports consist of an experience card showing pay rolls, rates, and premiums by classification; a loss card (printed on the back of the exposure card just referred to) showing compensation and medical losses incurred by individual claims; individual case reports on all deaths, permanent total, major permanent, indeterminate, and other cases where the cost equals or exceeds \$600 and in addition an individual case report for each open case not above provided for.

Upon receipt of these policy or risk reports the industrial commission checks the losses, item by item, against the commission records. This check is made not only to determine the correctness of the loss figures but also of the manual classification. The commission also has rate sheets together with the records of adjusted rates in the experience rated group for use in checking the rates shown in the policy reports.

The industrial commission record used in the checking of losses is the synopsis which is made for every injury case reported to the industrial commission. This synopsis is started when the first report

of injury is received and is completed as the necessary information becomes available. From this synopsis, which is made on a 5 by 8 inch card, we punch a Hollerith card which is used by us for report purposes generally. This Hollerith card, however, is not the one, hereafter referred to, used in compiling data in rate matters. To go back to the synopsis. These synopses are filed under the name of employer or risk. Upon the receipt by us from the insurance company of a policy or risk experience report we pull the synopses for the same risk for the purpose of checking individual loss items.

Any differences between the records of the commission and the carrier policy reports are adjusted by correspondence. After the policy reports and the commission records are in accord a separate set of Hollerith cards are punched for uses later referred to. Also at this time the necessary information is sent to the Virginia Rating Bureau for the purpose of making rate adjustments in the experience rated group.

When the reports for a complete policy year have been received, checked, and the necessary Hollerith records made, the experience is combined by manual classifications from these Hollerith cards and a copy of the results forwarded by us to the National Council for use by them in rate matters.

Some of the advantages of the Virginia plan are: (1) The data employed in rate making and individual rate adjustment are obtained from the same reports and in consequence are on a uniform basis. Further, the loss figures in these reports having been checked against the records of the industrial commission the correctness of the figures in rate adjustments and rate making are attested by the commission. (2) Establishing a set of detailed records with the State that will permit an actual duplication of Schedule Z at any time in the future. (3) With the use of this set of records and a debit and credit system the changes occurring in Schedule Z of a given year over a period of practically five years can be made readily available, thus eliminating any question of judgment as to the result of reopened cases or changes in estimates on open cases. (4) The availability of risk experience provides ready means of studying loss ratios by size of risk. (5) Sufficient information is available with the commission to determine any off-balance as a result of the application of the experience rating plan. (6) Detailed information is with the commission to enable studies of medical costs. (7) Detailed information is available by risks which is of use to the commission in conjunction with frequency records for contact work with employers to encourage accident prevention. (8) The fact of the existence of the plan of itself causes more care on the part of some carriers in the preparation of reports to be used in connection with rate making and rate adjustments. Further, where reports are not carefully made, with resulting errors, the commission requires corrected reports.

Stated in a general way it is believed the plan will tend to improve the rate-making procedure. It also gives the State a much better working knowledge of material matters to do with rates and enables the industrial commission to be of more practical benefit to the parties concerned in our State.

DISCUSSION

Chairman ROACH. Is there any discussion on this paper?

Mr. STANLEY (Georgia). Several years ago we were requested to increase the budget by \$20,000 and to put in a real statistical department. The law would not authorize us to do that, so we visited the various States to see what laws they had on the subject. We found something that appealed to us, recommended it to the general assembly, and asked to be permitted to put it in the Georgia law, which the general assembly did without any question; so we are now establishing a department exactly on the line of the Virginia department, and in the future we think we can furnish some real statistics for all Georgia.

Mr. DEANS. May I say North Carolina is doing the same thing, practically. Virginia, Georgia, and North Carolina are standardizing statistics as the gentleman from Illinois has requested.

Mr. MAGUIRE. I should like to ask Mr. Deans what the legislative experience was on having in the act that the employers report man-hour experience and having it passed. I had never heard of the existence of such an act. Now I hear it from Mr. Deans, from Mr. McShane, and from Mr. Stanley.

Mr. DEANS. The only thing we got the legislature to do was to change the law so that we could get the report on all expense.

Mr. MAGUIRE. I mean man-hours.

Mr. DEANS. We make our own rule.

Chairman ROACH. Do they report man-hours?

Mr. DEANS. Yes, sir.

Mr. STANLEY. The law in Georgia compels it.

Mr. MAGUIRE. We are not quite so fortunate.

Mr. DEANS. We have a friendly legislature.

Chairman ROACH. After the legislature passes the law, how are you going to get the employers to do it? Though I think it is highly desirable; I am very much in favor of that because then we will know something about bookkeeping in accident-prevention work.

Mr. PATTON (New York). As far as I know, no progress has yet been made in this. It is highly essential in developing anything worth while to get a more accurate detailed report of the cause of the accident. I doubt whether Virginia, North Carolina, and Georgia can tell this body to-day any more about the real cause of accidents than any of the rest of the States can, and that is saying very little.

A year ago a former president of the National Safety Council asked me to report to him on the number of accidents of a particular sort. I told him there were 313 ladder accidents, all caused by slipping, and he came back at me and said, "Yes, but what made the ladder slip?"

I said, "It may have been that the floor was slippery, or the room was dark, or the man was carrying a heavy burden and bumped into something."

"Well," he said, "I think some State should become interested sufficiently to give us the real cause of accidents."

The answer to that is that the compensation jurisdictions do not need to know it in order to settle a compensation case. The minute a claimant comes up and makes it appear that the claim was within the law, the referee is simply interested to know whether he ought or ought not make an award. The statistical end of it is the tail of the dog and the tail has been very much bobbed.

You will not get an active administration to bother about that sort of thing, and in the absence of that all of our compensation statistics will be much less worth while for accident-prevention purposes.

I congratulate Mr. Maguire heartily for what he is doing in Pennsylvania. I think it is a great advance step, a step which has been under consideration in New York State for several months. However, it is simpler for him because his State gets no accident reports unless there are three days of lost time. We get thousands of accident reports in which there is no lost time and schedules are prepared, but I think Mr. Maguire deserves congratulations on the effort he has made.

Chairman ROACH. Is there any more discussion on this very important question? If not, we have a visitor here to-day from Porto Rico. The president of the association has asked me to present him to the convention, and we will give him 10 minutes' time in which to address the meeting.

Our visitor is Mr. Prudencio Rivera Martinez, who is president of the Federation of Labor of the Island of Porto Rico, and represents the industrial commission. Porto Rico is one of our distant relatives.

Mr. MARTINEZ. I want to make clear that I appear before you as a delegate to this convention, selected by the Industrial Commission of Porto Rico. I am sorry I have interfered with your program. If anybody is to be blamed for this, it is our dear friend, Doctor Stack. As soon as he knew I was in New York, he wanted me to prepare a paper for you, which I did, and I expect to get some action from this convention on two or three important points relating to our Industrial Commission of Porto Rico.

A Short Review of Workmen's Compensation Legislation in Porto Rico

By P. RIVERA MARTINEZ, *commissioner Industrial Commission of Porto Rico*

Legislation covering industrial accidents in Porto Rico has been accomplished during the last 14 years. On April 13, 1916, the Legislature of Porto Rico approved an act creating the workmen's relief commission, for the purpose of providing for the relief of such workers as might be injured or of the dependent families of those who might lose their lives while engaged in different trades and occupations. The commission as first organized was composed of the attorney general, the treasurer of Porto Rico, the director of labor, charities, and corrections, and two other members appointed by the governor. This law, which was in force until June 30, 1918, was optional.

Prior to the enactment of the act of 1916, the protection of laborers against accidents occurring in the course of their employment was intended to be covered by the provisions of the Civil Code (sections 1803 and 1804) under the title "Obligations which arise from fault or negligence." An employers' liability act was passed by the Legislative Assembly of Porto Rico in 1902, which in practice made null the right of the workmen to relief from injuries sustained in dangerous occupations. Attempts were made by the legislatures of 1913, 1914, and 1915 to adopt a workmen's compensation act which would produce practical results and several bills were introduced and considered, but all failed of passage. Finally, the act of 1916, already referred to, was enacted.

As above stated, this law was optional, and it was this feature of the act which gave rise to legal questions presented to the courts in two test cases. The decisions rendered prompted the legislature to amend the law in some respects and to make it compulsory (Act No. 10, special session of 1918). This new feature was tested by means of injunction brought by the New York & Porto Rico Steamship Co. against the treasurer of Porto Rico to prevent collection of the premium fixed by the workmen's relief commission. The company was sustained in its contention before the lower court, but on appeal to the circuit court of appeals at Boston the decision was reversed and the fact established clearly that the workmen's compensation act was compulsory for all employers. The act of 1918, of a compulsory nature, was subsequently amended to meet new demands by the legislatures of 1919, 1920, 1921, and 1925. These amendments were intended to liberalize the law and make it more generally applicable, especially to extending its benefits to all laborers engaged in agriculture. Then came the law of 1928.

Act of 1928

The act approved on May 14, 1928, which went into effect on August 13 of that year, is the one under which the industrial commission is now operating. Consequently, we have gone through our second year under the new law. The provisions of this new law brought about a radical change in workmen's compensation service in Porto Rico. Compulsory monopolistic State insurance was replaced by establishment of employers' direct liability for compensation, but with the privilege of insuring with private insurance companies, or of self-insurance upon complying with the provisions of the law. Insular and municipal government employees must be insured in the State fund. The act is applicable to all laborers and employees, except such as are engaged in domestic service or casual employment, and to all employers who employ one or more laborers or employees, whatever their wages or salaries may be. Cases excepted from the provisions of the law are:

1. When the laborer attempts to commit a crime or to injure his employer or any other person, or when he voluntarily causes himself injury.
2. When the laborer is intoxicated, provided such intoxication is the cause of the accident.
3. When the injury is caused by the criminal act of a third person.

4. When the recklessness of the laborer is the sole cause of the injury.

The administration of the law is in the hands of three different entities, each with clearly defined duties, to wit: The superintendent of insurance, the treasurer of Porto Rico, and the industrial commission. Cooperation must exist among these three offices if the law is to be successfully administered. Responsibility is so great and work so hard at times that we can not slacken in our duty, for if we do the whole structure is liable to fall down.

The superintendent of insurance has to exercise the greatest care in fixing the rates; it is his duty also to execute the decisions of the industrial commission and to direct attachment of the property of any employer who fails to fulfill his obligation of insuring his workmen; the treasurer of Porto Rico must be very prompt in assessing, levying, and collecting from the employers the premiums fixed by the superintendent of insurance; and the industrial commission should always stand ready to provide good medical service and hospitalization and to decide the cases promptly. In this none of these entities should fail.

Although, as above stated, there are three different entities that have to do with the administration of this law, the people generally believe that the industrial commission runs the whole machinery and it gets the blame for everything which seems not to be satisfactory for the one concerned.

The Industrial Commission

Under the new law now in operation the industrial commission is composed of three members appointed by the governor with the advice and consent of the senate, who hold office for a term of three years. This commission is attached to the department of agriculture and labor, has quasi-judicial functions as regards the decision of all cases of accidents covered by the act, and it also has administrative functions as to the rendering of medical service and the liquidation of cases of laborers whose employers are insured in the State fund. The commission must also see that proper and adequate medical service and hospitalization be provided to those injured laborers working for employers insured with private insurance companies or those who are self-insured.

Rights of Laborers

Under our law any laborer covered by it is entitled to receive medical attendance without limit and such medicines and sustenance as may be prescribed, including hospital services when necessary. If the injury is of a temporary nature the laborer is entitled to compensation equal to one-half of the wages received by him the day of the accident. In cases of permanent partial disability, in addition to his weekly compensation he is entitled to such an indemnity as the law provides. Total permanent disability cases are awarded \$1,000 as a minimum and \$3,000 as a maximum. A like compensation is awarded to beneficiaries in cases of death, same to be graded according to the earning capacity of the deceased laborer and his probability of life,

Medical and Hospital Service

It is obvious that the medical division is one of the most important in the industrial commission. The initiative of recommending physicians and hospitals for the workmen sustaining injuries when protected by the State fund rests on the commissioner of health, as it has been construed by the attorney general, and he also fixes the rates to be paid for hospitalization services.

Contracts are entered into with physicians at a very conservative cost. At present we have under contract 69 physicians in the island at a cost of \$2,922.40 a month, an average of \$42.35 for each. In addition to this, contracts have been signed with an eye specialist for the whole island in the city of San Juan where all laborers suffering from eye accidents are treated, and with surgeons who perform all necessary operations in the clinics throughout the island where our injured employees are hospitalized. Contracts have also been signed with physicians who compose our central medical staff. For all these special services we were paying on June 30, 1930, the amount of \$1,425, making a total of \$4,347.40 a month for the entire medical service, excluding, of course, the hospitalization expenses.

Although the rates charged by the clinics are not considered too high in view of the service rendered, yet this is something which I have always considered a very serious problem, to provide medical attendance and hospitalization at a cost averaging \$3 a day for laborers getting wages of 60 cents a day in the agricultural fields. Just imagine the kind of pay rolls on which premiums are collected, 60 cents a day, to provide such medical and hospital expenses.

I have deemed it advisable to bring to the consideration of this convention this part of our service in an effort to get your views and advice on something which, as I have said before, seems to be a problem without solution—medical and hospitalization expenses on an average of \$3 for underfed people afflicted with maladies and placed on the pay roll at 35, 40, 45, 50, 55, and 60 cent wages for 9 and 10 hours of hard labor.

Weekly Compensations

While the law provides for a weekly compensation in cases of temporary disability at the rate of one-half the weekly wages received by the laborer the day of the accident, payments can not exceed \$15 a week nor be less than \$3 a week. No compensation is provided for the first seven days following the accident (waiting period) and the period of such payments shall in no case exceed 104 weeks.

The payment of weekly compensation to the laborers while under medical treatment has received special attention and consideration on the part of the commission and the treasurer of Porto Rico. A plan was devised whereby through the appointment of a special disbursing officer under the treasurer of Porto Rico, and with the cooperation of all the internal-revenue collectors throughout the island, checks could be mailed regularly to the injured laborers in payment of their weekly compensation.

However, we are not satisfied with the results accomplished. We ought to have a better system, more accurate and more expeditious.

In a place like ours, where most of the workers, in addition to getting such low pay are unemployed half of the year, with no financial means and with large families to take care of, it is imperative that the weekly compensation reach them when it is most needed, that is, when they are under medical treatment and unable to work. With that end in view I beg the kind attention and consideration of this convention, so that we may have proper suggestions as to adopting plans that might meet our local conditions in the island.

Noninsured Employers

Another most important point which we desire to bring to the attention of this convention is that regarding the noninsured employers. Although our law is compulsory and every employer is bound by law to secure compensation to his workmen for injury, disease, or death contracted by them while in the course of employment, by insuring in any one of the three forms provided by law, yet the continued existence of noninsured employers throughout the island is a matter of great concern to us.

The matter of noninsured employers has been really one of the most serious problems with which our commission has been confronted since it was organized two years ago. Except those laborers who are expressly excluded by law from its provisions, all laborers and employees are under our protection. Since the procedure followed with these noninsured employers was of necessity a very slow one, as the law stood until very recently, we had to recommend that the law be amended so as to remedy the unfortunate situation in which laborers working for such employers found themselves when they sustained an accident. Conditions have been such during the two years past, we must frankly confess, that in order to meet local conditions even partially, we have deviated in many instances from the plain letter of the law and have given thought only to the spirit inspiring this legislation.

Fortunately, our action in giving protection to all these cases of employees of noninsured employers has been legalized by the insular legislature, who saw clearly and justified our position. The law has been amended not only to give protection to all new cases, but has been made retroactive in effect to protect all previous cases attended and decided by the industrial commission.

By an amendment to section 41 of the law the State fund now takes care of injured laborers working for noninsured employers and extends to them all the benefits to which they are entitled under the law. When the case has been decided by the commission the treasurer of Porto Rico is notified in regard to the compensation allowed and other expenses which the commission may have incurred, and it is then the duty of the treasurer to collect from the employer the total cost of the case, which, when collected shall be covered into the workmen's relief trust fund as a reimbursement to said fund of such amounts as were expended in connection with the case.

A revolving fund is created with any funds in the treasury not otherwise appropriated, and in such amount as may be necessary, to take care of cases of employees of noninsured employers occurring between August 13, 1928 (the date on which our compensation law came into effect), and June 30, 1930. Should a noninsured employer

prove to be insolvent, the superintendent of insurance has been authorized to include in the insurance rates, as a part of the cost of the workmen's relief insurance service, such percentage as may be necessary to cover such cases.

Although it seems that, for the time being, this problem of the noninsured employers has been brought to some solution in our island, I have deemed it to be proper for us to bring this matter to your consideration for consultation, so that you may clearly express your views regarding the soundness or unsoundness of this remedy from the economic standpoint and also from the social standpoint, bearing in mind the paternal obligation of the State to get some redress or payment for damages for those who are deprived of all other legal means.

Another important amendment to our law by the last legislature is that intended to empower the commission to render judgment by default when the parties, or any of them, have been summoned and they fail to appear for hearing.

In the matter of hearings, the commission, under the authority conferred by law, avails itself of the services of the municipal judges and justices of the peace in conducting these hearings throughout the island.

Stoppage of Work Done Without Insurance

In the cases of contractors of private jobs who fail to insure according to the provisions of the act, the industrial commission is empowered to stop such works, for which purpose it may utilize the services of any marshal or the services of the insular police force. Such stoppage of work shall continue until the contractor has insured as provided by law.

Agreements Between Employers and Workmen

Under sections 10 and 21 of the law the insurer and the laborer may enter into an agreement in regard to compensation, but those agreements are binding on the parties when they have been approved by the industrial commission, and, as the law reads, "such agreements shall be approved by the industrial commission only when the terms conform to this act."

Hundreds of these agreements entered into between the insurers (private insurance companies or self-insurers) and the workmen are considered by the commission during the year. Serious consideration is given to said agreements in order to determine if their terms conform to the law.

In this connection it might be well to state that in cases of permanent partial disability, permanent total disability, and death, the law fixes a minimum and a maximum compensation to be paid to injured laborers or their beneficiaries, as the case may be.

This being the case it is obvious that the commission had to adopt a policy to be followed in awarding compensation in those cases, a policy equally applicable to State-fund cases and to cases of laborers whose employers are insured with private carriers or are self-insurers. According to the spirit and letter of the law, the commission in

grading the compensation considers only two factors: Earning capacity of the laborer and his probability of life.

Although the rule adopted is equally applied to all insurers, ordinarily most of the agreements submitted to the commission are based on the minimum, and are not acceptable to the commission because in its opinion the terms of the agreements do not conform to the law. In such cases the agreements are rejected and the cases are decided by the industrial commission on their merits, just as if said agreements had never been submitted.

Most of the cases taken to the courts by carriers and by self-insurers hinge on this point. The commission has always contended that it has a right under the law to reject an agreement which in its opinion does not conform to the law. This contention has elicited various decisions from the courts, some of them holding the same views the commission holds, while others are at variance with us on this point.

In view of this circumstance, and since none of the parties is allowed to bring any appeal from a decision of a district court to the supreme court and in order to secure final and uniform decisions, we have requested that the law be amended so as to have the District Court of San Juan clothed with exclusive jurisdiction throughout Porto Rico to review the decisions of the industrial commission, subject to an appeal to the supreme court.

During the year ending June 30, 1930, 46 cases were taken to the courts. Almost all of them were petitions for review under section 15 of the act. These petitions, classified by insurers, are as follows: Private carriers, 16; self-insurers, 7; State fund, 12; noninsured, 11. When a petition is classified under State fund it does not necessarily mean that the State fund was the appellant or petitioner, but it means that the laborer in the case was not satisfied with the compensation awarded to him and asked the court for a review of our decision. Of the 46 petitions for review filed, 19 were decided in favor of the commission and 16 against it. Ten cases were pending decision at the close of the fiscal year and one was discontinued.

Summary and Conclusions

This short review of our legislation and particularly of the law now in operation and also of the activities of our commission under this new law, will give you an idea of the work conducted by the Industrial Commission of Porto Rico.

However, we are not very far from the truth if we say to you that we are not entirely satisfied with the results accomplished in our work. We would like to feel optimistic, but we do not.

The superintendent of insurance does; he feels that the State fund is solvent, that it can exist in competition with the private carriers in such a narrow field of industrial activities as ours. In the matter of compensation I honestly believe that there are many different aspects of the problem to be studied and to be taken into consideration.

I believe firmly in an actuarial survey, something never done in Porto Rico during the 14 years we have had a compensation law in operation. I believe that an actuarial survey of our workmen's compensation insurance fund should determine if the fund is solvent, if

the reserves are adequate; it must test the rates and the underwriting distribution of the rates.

I believe that this whole undertaking is strictly a technical actuarial problem requiring the services of an actuary of years of specialization in the actuarial undertaking of computing workmen's compensation reserves, workmen's compensation rates, and workmen's compensation underwriting problems or pay-roll distributions against rates, etc., and well versed with the internal factors of the merit rating system, etc.

I honestly believe that for years we have been wasting time and expense, and that because of our ignorance irreparable damage to our workmen's compensation fund has resulted in the past and might also result in the future.

Not only this, but there are also medical and social aspects in our local conditions that must be studied by competent authority coincident with the actuarial work.

According to the fifteenth census, taken as of April 1, 1930, the population of Porto Rico is 1,543,913. As the gross area, land and water, including the adjacent and dependent islands, is 3,435 square miles, the average to the square mile is 449.5 persons. There is hardly a more densely populated place under the American flag or perhaps in the world, with the exception of Belgium.

Our industrial field is very narrow. While there are employed in the island—when work can be found—not over 50,000 industrial workers, properly classed as mechanics in the building trades and construction works, in transportation, shops and other small industries, there are over 400,000 men, women, and children who must work in the agricultural fields if work can be provided. Sugar-cane, coffee, tobacco, and fruits constitute the main products of our agriculture.

In the above figures I am not including some 10,000 women tobacco strippers getting wages averaging \$3 a week and who work only 7 or 8 months in the year, and I am not including some 38,000 women and young girls employed in embroidery work and getting a wage of 90 cents to \$1.40 for a whole week's work.

Of the 400,000 men, women, and children above referred to, the bulk of them are employed in the sugar-cane fields. They work only six months in the year. Nobody knows and nobody has been able as yet to explain how this mass of Porto Rican workers live the whole year with only six months at work, and getting during those six months 20 and 25 cents per day for the children, 30 and 40 cents for the women, and 50 to 80 cents for the strongest men, who are capable of cutting many tons of cane with the machete.

The late Samuel Gompers, after having visited our island in 1905 and in 1914, and after having very carefully studied our conditions in Porto Rico, getting first-hand information, told the American people and the United States Congress that the working-men of Porto Rico lived on miracles. Conditions as found by Samuel Gompers have not changed since, and progress made by the working classes, if any, has never kept pace with that made by the big interests with invested capital, which see in our island only a place of cheap labor to make profits.

The rest of those 400,000 men, women, and children work in the tobacco fields or on the fruit plantations or risk their lives on the

coffee plantations up at the top of the mountains where this bean is grown.

The wages they get are 65 to 90 cents per day on the fruit and tobacco plantations, and some 35 to 45 cents for a whole family of four or more persons in picking coffee, up in the mountain regions.

This is, briefly, the explanation for a wretched and underfed people; for undernourished children and thousands and thousands suffering the effects of malnutrition, or, might I say, of no nutrition at all; for most of our agricultural workers going barefooted, as they can not buy shoes; and for our workers being affected with malaria and uncinariasis (hookworm). This is practically starvation, while our island has produced more than \$2,000,000,000 during the last 30 years of American régime—no clothes, no proper shelter, no food, no wages, and big profits made every year at the expense of this people, such profits being exported year in and year out to a more fortunate place in Europe or the United States, where the owners or absentee landlords reside. Due to such financial organization nothing is left in Porto Rico to be reproduced or reinvested in new industries and new industrial and commercial life except the meager cents which are termed wages.

The reason for bringing to you this information is this: This is the kind of workers sustaining accidents you have to take care of; this is the kind of people, my people, you have to contend with; it is upon such pay rolls that you collect premiums; for them you have to provide medical attendance and hospitalization. In many instances you have to feed them and cure them of their maladies before giving them the treatment properly required by the accident sustained; and it will not be a surprise to you if I say that an accident sustained by any of your well-fed workers, requiring two or three weeks' treatment and no hospitalization, may take over three months' treatment if sustained by one of these workers of Porto Rico, and that for him hospitalization is imperative.

I have brought this problem to your consideration only to demonstrate to you how necessary it is, in addition to the actuarial survey, also to study this medical and social aspect of the problem.

In conclusion, if it be not considered too much of an imposition on you, and with the desire to get some practical results for our island, I would dare suggest that this convention go on record recommending:

1. That the problem of workmen's compensation of Porto Rico, because of its peculiarities, is unique in the field of this service.

2. That in order to ascertain the truth and bring to light real conditions existing in Porto Rico, it is imperative that an actuarial survey be made by competent authority at the earliest possible time. By this survey it must be determined also—

- (a) If there is field enough in Porto Rico for the existence of the State fund, the private insurance companies, and the self-insurers at the same time;

- (b) If not, which would be the best system for the island, the private carriers or the monopolistic State fund; and

- (c) If in a country like Porto Rico it can be tolerated, without any danger to its economic structure, that the most powerful corporations take all the meat by constituting themselves self-insurers, leaving the bones to the private carriers and particularly to the

State fund which, according to the law, can not refuse to insure the small business, having the largest number of employers with the lowest amount of premiums collected.

3. That coincident with the actuarial survey, the social and medical sides of the problem be studied by competent authority to determine the effect of such conditions in this matter of insurance, so that we may know what would be an adequate rate or premium and an adequate compensation for the workers under the conditions in which they are employed.

4. That a study be also made of the whole machinery, very particularly so of the administrative organization of the Industrial Commission of Porto Rico, to determine if such organization responds to actual needs or what changes, if any, must be made to render service satisfactory to all concerned.

5. That this convention pledge its support to the Industrial Commission of Porto Rico in its efforts to make a success of the present law or of any other law which, after due consideration and careful study, may be considered the best and most practical by those in charge of the studies and surveys recommended.

6. That whatever action this convention may deem proper and wise to adopt, the same be communicated to the Governor of Porto Rico, so that he may be in a position to take steps that might lead to a better service and to assure the existence of a solvent State fund.

I want to add a few more words. Three different private companies did business in Porto Rico last year. The chief agent in the division of claims said that the Maryland Casualty Co. had a deficit of over \$42,000 during the last year. The Great American Indemnity Co. and the United States Casualty Co. quit business along that line. They say they do not want any more business in labor accidents, and the Maryland Casualty Co. is running a deficit. They say that they keep this insurance only to accommodate some of the employers for whom they also carry other lines—earthquake, storm, and fire insurance.

I hope that this convention will see its way clear to lend us the help we beg of you. I think that you have in your hands a very great amount of influence to see that Porto Rico has a proper law duly administered in accordance with local conditions.

DISCUSSION

Mr. McSHANE. I realize that we are now late and are trespassing on time that we should not take, but the appeal that has been made here, it seems to me, requires a little consideration and discussion. I should like to ask Mr. Martinez one or two questions. You have a territorial form of government?

Mr. MARTINEZ. I said the other night and I repeat here that we do not know what kind of government we have.

Mr. McSHANE. There was a territorial form of government in Porto Rico. Then you have your legislative body?

Mr. MARTINEZ. We elect our legislature and we were made collectively citizens of the United States and are supposed to enjoy the same privileges.

Mr. McSHANE. We understand that, Mr. Martinez. I wanted to bring it out.

Mr. MARTINEZ. But the courts have not agreed whether we are an organized or an unorganized Territory or a colony.

Mr. McSHANE. I wanted to lay a foundation in order to say something on this point. Mr. Martinez, I trust that you will not consider that the association is unsympathetic if you are advised, and I think that I am correct, that the problems you have put up to us and the action that you have requested that we take, from my viewpoint, are entirely outside the scope and purpose of this organization, and that for us to take the action that you desire would be an affront to your own Government.

I certainly would be affronted if this convention were to go on record to tell me, if we were to establish an exclusive State insurance fund in Utah, that we were wrong and that we were to do other things. It seems to me that it is a problem that must be worked out by your own people, under the government that has been established; that if the government that has been established is not satisfactory, your appeal is to the Congress of the United States, and not to this body.

We would get into trouble so deep that we could never get out, and we would destroy the organization, if we undertook to take up the problems that you have presented to us and presume to pass upon them.

I want you to know personally that I sympathize with the conditions that exist there, but I feel we are in no position to take official action regarding the matter.

Mr. MARTINEZ. I may say that I realize the position of the delegates. We are not dissatisfied. We are not at all dissatisfied with the kind of government we have in Porto Rico. The general consensus of opinion in our land stands for the American Government and American institutions, and we want to keep permanently our association with the United States. We understand that according to the treaty of Paris it is up to Congress to decide what our final status must be, and we are constantly appealing to Congress for modification of our laws and for extension and application of all those Federal laws that we think may be of benefit to our island.

But, I understood this: The Industrial Commission of Porto Rico is a member of this association and I understand that it is the duty of all the different bodies, agencies, or members of this association to try to help any of the members who are in distress or in need of intellectual help or of any official recommendation to get any reforms or any change anywhere; I do not want to be in conflict with this institution of which we are a member.

Mr. DUXBURY (Minnesota). May I ask the gentleman what legislative body, past or present, passed the present compensation law? Was that Congress or the local legislature?

Mr. MARTINEZ. Our local legislature.

Chairman ROACH. I will say for the delegates that I am afraid this matter brought up by Mr. Martinez is not a matter that can be given consideration by this organization, because you have your con-

stitution which plainly decides the objects that can be given consideration.

Mr. WILCOX (Wisconsin). As I recollect, the meeting at Paterson determined that the executive committee has power. By resolution of the association it was agreed that the executive committee should have authority and it should be its duty to bring aid to any State that wanted to clear up its workmen's compensation situation.

I haven't that action of the Paterson meeting quite in mind—Senator Duxbury ought to have it; he handled it—but I think I am correct in that statement that the executive committee was given that authority, and that whatever moneys were necessary to take care of the expense, etc., were to be used.

Mr. McSHANE. May I ask you a question, Mr. Wilcox? Was that resolution broad enough so that this convention could presume to go on record here officially telling a jurisdiction what kind of law it should have?

Mr. WILCOX. That was to give to the executive committee authority to take whatever action it thought was necessary to the helpfulness of any constituent member.

Mr. McSHANE. Then I move that these propositions be referred to the executive committee.

[The motion was seconded and carried.]

Chairman ROACH. We have one more matter to come before us and that is the report of a committee appointed by the president to consider several questions—the desirability of—

1. Creation of the office of second vice president, in line for promotion in case of death or resignation of president.
2. Whether or not the association should continue the practice of holding its annual meetings in the home State of the president, rather than consider the geographical conveniences and equity of expenses of delegates participating.
3. That the annual meetings of the association be convened on the fourth Monday in May.

Is the committee ready to report?

Mr. DEANS. I understand that Mr. Wilcox, who is chairman of that committee, is prepared to give that report, but because of our constitution it is not proper for him to report at this time, and therefore, we shall have to wait until Friday morning before he can report.

Mr. MAGUIRE. I wonder if we could receive the report of the committee on statistics and compensation insurance costs, which was to have been made by Doctor Hatch on Monday.

Mr. HATCH. I can make a written report which can be incorporated in the proceedings, if that is satisfactory.

Chairman ROACH. Is that the sense of the meeting, that this report be incorporated in the record and not presented formally?

Mr. MAGUIRE. I think the record will be available this time next year. I should like to hear a brief report now and I move that the report be presented at this time.

Mr. HATCH. I will be very brief.

REPORT OF COMMITTEE ON STATISTICS AND COMPENSATION INSURANCE COSTSBy LEONARD W. HATCH, *Chairman*

The committee on statistics and compensation costs of the association, as such, has held no meeting during the past year. No matter came up which seemed to be an occasion for a meeting of the committee; however, as for last year, it seems to be in order for me to report what has occurred in connection with the revision of the "Standard plan for accident statistics" under the auspices of the American Standards Association, which revision is sponsored by this association and the National Safety Council.

As before reported, there were four subcommittees at work on that revision—one on definitions, one on rates, one on causes, and one on industry classification.

Last year I reported that the subcommittee on definitions had completed its report. Since then that subcommittee saw fit to withdraw its first report, in the light of certain further study which had been made, and reconsidered that report, after which a final report of the subcommittee on definitions was filed with the chairman of the sectional committee.

The subcommittee on rates was reported last year as progressing with its work, but it had not yet reached any report. Since last year that committee also has filed its report, so that the subcommittees on definitions and rates have now filed their final reports, which are ready for submission to the sectional committee.

The sectional committee is scheduled for a meeting in Pittsburgh on next Monday [September 29, 1930] to take up those two reports without waiting for the reports of the other two subcommittees. It is hoped that those two reports may be agreed to by the sectional committee, in which case it is possible that that part of the revision of the standard plan which is to a considerable extent separate from the other part of the revision, may go through and be established as the American standard.

The subcommittee on the cause classification is going very thoroughly into the whole question of whether the present classification tells us all that we can find out by the statistical method of causes of accidents, and that seems to me to be a very important thing for that subcommittee to do. If accident statistics are worth anything, they will be worth something for guidance in accident prevention. There is a great deal of dissatisfaction with the present cause classification.

The committee is faced with the difficult problem of whether it is possible for the different agencies to secure the necessary data by which to make a more thorough analysis by causes of accident; however, the committee is working as vigorously and diligently as can be expected of any committee of busy officials who have their current work to look after first of all. I feel that my knowledge of what that committee is aiming at shows it to be a very hopeful endeavor, which, if it proves to be within the realm of practicability for statistical agencies, will improve very much the helpfulness of accident statistics by causes in accident-prevention work. So, sub-

stantial progress has been made by that subcommittee, but it is not yet ready to report.

The subcommittee on industry classification I mention last because that shows the least progress. Some work has been done on that part of the program, but that also must await a later completion.

I think that covers briefly the present status, as compared with a year ago, of the work of revision of the standard plan for accident statistics.

Chairman ROACH. You have heard the report made by Doctor Hatch. If no comments are made, we will consider it part of the record.

[On suggestion of Doctor Stack, a motion was made, seconded, and carried that Dr. Hutchins, a noted authority on rehabilitation work, be invited to address the Thursday morning session of the convention on the subject of rehabilitation work.]

[Meeting adjourned.]

THURSDAY, SEPTEMBER 25—MORNING SESSION

Chairman, Russel Kessel, M. D., chief medical examiner Workmen's Compensation Department of West Virginia

President STACK. The first paper this morning is on The Workmen's Compensation Act in Relation to Handicapped Individuals, by Dr. Frank G. Pedley, director of the Industrial Clinic at the Montreal General Hospital. Mr. Sharpe, will you introduce Doctor Pedley?

Mr. SHARPE (Quebec). It gives me very great pleasure indeed to introduce Dr. Frank G. Pedley to this audience. He represents one of the largest industrial clinics in Canada and our commission is very much indebted to him for cooperation both through his hospital and through the doctors representing the institution.

The Province of Quebec, as you know, is operating under French law; that is, our laws are drafted after those in force in France. In France, since 1898 there has been in force legislation with respect to workmen's compensation insurance. You can imagine that during that time a considerable amount of jurisprudence has been established, and our commission considered it desirable to follow that jurisprudence, and, following that, a workman in the Province of Quebec is not obliged to prove that he had an accident by reason of any force, sudden shock, or abnormal effort. The workman simply has to prove that the lesion which he suffers manifests itself in the course of the work. That is very broad. The paper Doctor Pedley is to present deals with such impaired risks and is of great interest to us in Quebec, and we will be very much interested to hear the discussion which results.

The Workmen's Compensation Act in Relation to Handicapped Individuals

By FRANK G. PEDLEY, M. D., *Montreal General Hospital*

The handicapped individual is usually in a sorry plight economically, but his disadvantages are occasionally accentuated by the acts of well-meaning legislatures, and it is not uncommon to find in workmen's compensation laws paragraphs like the following:

Where the accident results in an injury which does not, in itself, constitute total incapacity but which aggravates an already existing permanent injury so that the workman becomes totally incapacitated, then the workman shall be compensated as for permanent total incapacity, taking into account, however, what he is receiving or has already received.

This clause in the Quebec workmen's compensation act has caused a good deal of comment. Many employers are unwilling to engage men with various handicaps, particularly men who have lost an arm, or a leg, or the sight of one eye, because if the opposite member should

be lost the liability is very materially increased. Committees have been formed by the Montreal Council of Social Agencies and the Province of Quebec Safety League to consider the matter, and it is largely concerning the activities of these two committees that I wish to speak.

As a social problem the handicapped individual falls into two groups. The first group comprises those individuals who are able to work, but whose handicaps impose an increased liability on the employer. The second group—probably a larger group—is composed of those individuals who have some chronic illness and are able to work part time only.

Inasmuch as the second group is of small importance from the standpoint of compensation I need consider it very briefly in this paper. There are in any community large numbers of individuals who are excluded from active competitive employment by virtue of some disability. I refer particularly to those suffering from tuberculosis, heart disease, rheumatism, and the like. Many such persons are able to do some work, and indeed their rehabilitation is often accelerated by suitable employment, but industries as a whole are unwilling to employ lame ducks. It is true that certain companies have made a practice of taking on chronic cases of disease and convalescents; but this practice is carried on to such a limited extent that it only scratches the surface of the problem. For such individuals supervised workshops are the thing. The Altro Workshops in New York, the Spero Shop in London, the Papworth Colony in England, the Potts Memorial Institution at Livingston, N. Y., the Vetcraft Shops in Canada, and a number of similar establishments all over the country have demonstrated the great social value of the supervised workshop. The handicapped individual who finds all doors firmly closed against him is not in the way of becoming a good citizen or a creditable parent. Work in itself is a great healer, both mentally and physically. At the present time commission boards have not been called upon to take any part in the care of handicapped individuals, except those who receive their handicaps accidentally. I wish to leave this part of the problem, therefore, and return to the consideration of the first group, which comprises those individuals who are able to work but whose handicaps impose an increased liability on their employers.

In the case of 1-eyed, 1-armed, and 1-legged individuals I find that seven States and the Province of Quebec require that in the event of the opposite member being lost the employer must pay the difference between 100 per cent and the amount already received, if any, for the first accident. In the case of an individual who is congenitally blind in one eye, or has lost his eye in youth, the employer must assume a liability of 100 per cent if he engages such a man. Any one of us in the position of the employer would refuse to accept this unusual risk, and actually a good many employers do. The result is that this man gets jobs only in industries which do not conduct preemployment examinations.

I find that about 12 States, anticipating apparently that the handicapped individual will be banned, generally compensate for the second injury only; but this is not a satisfactory solution, for in the event of a 1-eyed, 1-armed, or 1-legged man losing the opposite member partial compensation is not adequate for complete disability.

Other States base compensation for the second injury on the earnings at the time of the second injury; but this is not satisfactory either, for a 1-eyed man is probably as good an earner as one who is normal, and the employer becomes liable for 100 per cent disability just the same.

The really adequate solution appears to have been found in the creation of a special fund to carry this increased liability. It is not necessary to go into the details of this fund. I need only refer you to the paper presented by Mr. Knerr, of Utah, at the annual meeting of this association in 1929. Some 10 States in this country have created a second-accident fund or have made other arrangements amounting to the same thing. In Ontario the extra cost of the second accident is charged to the disaster fund. The second-accident fund has been recommended to the Minister of Public Works and Labor in the Province of Quebec, and it is greatly to be hoped that he will see his way clear to its creation.

There is another phase of the problem which is not affected by the second-accident fund. A very considerable number of individuals are apparently predisposed to disease or accident. Deaf persons and those with very defective vision are presumably more liable to accident than normal people. Men with large inguinal rings are thought to be predisposed to hernia; men with arthritic changes in the spine are undoubtedly bad risks; diabetics and syphilitics are apt to have delayed convalescence after injury. Such men are usually classed by medical examiners as substandard risks and frequently fail to secure employment in consequence. Yet is it to be assumed that all these individuals are to be deprived of the opportunity of earning a livelihood? Starvation is not a satisfactory treatment for the handicapped.

In Connecticut, as many of you are aware, an interesting clause is contained in the workmen's compensation act:

Defective employee.—Whenever any person having a contract of employment, or desiring to enter into a contract of employment, shall have any physical defect which imposes upon his employer, or prospective employer, a further or unusual hazard, it shall be permissible for such person to waive in writing for himself or his dependents, or both, any rights to compensation under the provisions of said chapter 284 for any personal injury arising out of and in the course of his employment, or death resulting therefrom, which may be found by the commissioner having jurisdiction to be attributable in a material degree to such physical defect. No such waiver shall become effective unless the defect in question shall be plainly described therein nor until the commissioner having jurisdiction shall find that the person signing such waiver fully understands the meaning thereof and, if such person shall be a minor, that one of the parents or guardian of said minor shall have approved the same in writing, nor until such commissioner shall, in writing, approve thereof and furnish each of the parties thereto with a copy thereof. No such waiver shall be a bar to a claim by the person signing the same, or his dependents, for compensation for any injury arising out of and in the course of his employment, or death resulting therefrom, which injury shall not be found to be attributable in a material degree to the particular condition described therein. The rights and liabilities of the parties to such waiver as to injuries arising out of and in the course of the employment and within the terms of such waiver shall be such as are provided by law in the case of an employer having regularly less than five employees who shall not have accepted the provisions of said chapter 284. (Connecticut Public Acts, 1927, ch. 307, sec. 6.)

There are those who think this clause unconstitutional, in that it deprives an individual of his rights as a citizen. On the other hand, denial of the right to sign a waiver is tantamount to infringement

of personal liberty. It is a matter for the courts to decide, but so far as I know no one has challenged this clause. I had opportunity of observing the working of the Connecticut act for a period of two years, and my experience with the waiver from a medical standpoint was very happy. The examining physician was relieved of a great deal of responsibility by it, and many individuals secured employment who would otherwise have been rejected. In Connecticut, however, I believe it is possible for an unscrupulous employer to exploit a workman, since it is difficult for the compensation commission to examine individually each man who signs a waiver. And I think the signing of a waiver falls short of a satisfactory solution, since it is not enough to tell a handicapped individual who has signed a waiver that he is not eligible for compensation. Such persons actually need compensation more than normal persons.

I believe the waiver system should be permitted, but that each individual who signs a waiver should be approved by an impartial physician representing the compensation commission, and that whenever a waiver has been signed the second-accident fund, which is the State, should shoulder the responsibility from which the employer is relieved.

DISCUSSION

Chairman **KESSEL**. We will have a discussion by Dr. Thomas R. Crowder, medical director of The Pullman Co., Chicago, Ill.

Doctor **CROWDER**. Doctor Pedley has brought before us what I consider a very important subject, one with large social implications, which he has crystallized in the statements, "The handicapped individual who finds all doors firmly closed against him is not in the way of becoming a good citizen or a creditable parent," and "Starvation is not a satisfactory treatment for the handicapped."

It goes without saying that applicants who can not work with safety to themselves and their fellow employees must be rejected. Industry can not make use of them and must protect itself against them. But there are many handicapped who can work effectively. Doctor Pedley has pointed out laws in some of the States and Provinces which militate against their being able to find jobs. These laws no doubt are intended to protect the handicapped workman; but in effect they so penalize the employer as to make him reject the applicant and deprive him of a job. A job is the thing the handicapped workman needs most. Without it the extra compensation he might receive for injury is entirely nonoperative. The remedy for this condition is not a medical one, but a remedy is certainly needed.

Men who have been handicapped through injury in a plant deserve and should receive from their employers special consideration in order that they may continue as useful and productive members of society. In most places I believe they get it. Wherever possible the man should be fitted to a job suited to his limited capacity and paid for the work he can do. He should not be allowed to use the injury sustained as an excuse for loafing. He should not be made to feel that he can draw wages whether or not he does honest work. Good workmen are often spoiled by such treatment.

The real difficulty comes, of course, when the handicapped workman must seek a job in a new location, must become an applicant for work in the open market of employment. In my estimation the wise industrial physician tries to find out what kind of work his defective applicant can do and to place him in it, rather than to discard him simply because he is defective, and wise industrial management supports this policy. It may work all right to discard men simply because they are found to be somewhat greater insurance or accident risks so long as only a few industries apply the physical examination test; but as more and more industries apply such tests and the open field of placement on the simple basis of capacity to produce becomes more restricted, the rejected applicant finds himself in a bad way. In order to live he must work, and the world is becoming so industrialized that only a few can work for themselves. To reject the handicapped is to eliminate a considerable proportion of the potential working forces, among them many good workmen. If strictly applied, it would necessitate the support of many public charges and bring about a social situation which must in time lead to political action for its correction, in which case industry can not escape large charges.

The question is, what can the handicapped do? Men who have lost one eye are safe workmen for almost any occupation. They are scarcely handicapped at all. They are rejected by many employers because of the extra hazard of total blindness. It is a very small risk, if occupations especially hazardous to all eyes are avoided, and can well be assumed by any large organization. In 20 years we have had no case of blindness in such a man, though we have many of them in service. They should be and are required to wear protective goggles in shop work, and they should not be given work which requires accurate judgment of distance.

Men with fingers and thumbs off are usually as good workmen in practice as men not so crippled. Nature has a way of compensating for these things. A man will seldom apply for work he can not do, and I would always give such a man a chance to make good if he can.

Men who have lost a hand or an arm are considerably limited in their capacity, but if the proper occupation is found, they often make useful employees. With the proper mechanical appliance for the job he is doing, such a man often keeps up with those who have two good hands.

Men who have lost a foot or a leg are very little handicapped unless the amputation is done high above the knee. In general they should not work off the ground, though with a low amputation, a good stump, and a well-fitting artificial limb, many of them can climb ladders and work on scaffolds very well.

Men who are handicapped from defects due to some constitutional disorder are more of a problem than those handicapped through injury. The selection of employment must be more carefully made, and conditions under which the work is done must be considered in the selection of jobs. Some of the commonly encountered conditions are:

Men with defective vision. Generally this can be corrected or greatly improved by glasses. If the defective vision can be brought

to or near the normal, such a man should be able to do any kind of work except some special job where it is practically impossible to wear glasses. Many rough jobs are done as well by those with very low vision, even without corrective lenses.

Deafness is not much of a handicap for work in most factories. The deaf learn to use their eyes effectively and acquire the habit of attention. It has been our experience that deaf mutes are exceptionally good workmen. They waste no time, and they seldom make trouble.

Heart diseases make a difficult problem. If bad, these cases can not work at anything with safety to themselves. If only moderately severe, they may do clerical work or possibly very light labor. There are, however, many hearts showing distinct physical evidence of organic lesions which cause no symptoms and are but slightly handicapping. Such persons should not be put at very heavy labor, but they can do anything which does not involve heavy physical strain. They should be examined from time to time until it is determined that the work they do is suited to their capacities.

Hernia is a defect which should disqualify men for very heavy work, but a man with the ordinary kind of hernia can do light to moderately heavy work without detriment to his health, provided he wears a properly fitted truss. There is a little danger of strangulation in any of these cases, but it is very slight and industry can well afford to take the risk and give them work. To do otherwise eliminates at once about 5 per cent of male workers. They can not be spared and they should not be deprived of jobs. Industry should not, however, be made responsible for an increase or aggravation of the ordinary form of hernia through work. It is a natural anatomical defect which, with the lapse of time, is likely to become more troublesome anyway, regardless of work. Making the employer responsible gives the workman a little compensation now and then, but it more often deprives him of a job which would pay him much more. Some compensation commissions have a correct view of this subject; others have yet much to learn.

In general, a man who is crippled either through injury or constitutional disease and who realizes his handicap is likely to be faithful and loyal to the organization that gives him work to do, thus enabling him to maintain his independence and self-respect. He is, therefore, likely to be useful to the organization not only in spite of, but also because of, his handicap, provided the work is suited to his capacity. It should be the industrial physician's endeavor to fit him into a task that he can do.

Chairman **KESSEL**. The subject will now be open for general discussion.

Miss **PERKINS** (New York). I was greatly disappointed at the general conclusion of Doctor Pedley's paper. With the first half of his paper there could be no possible quarrel. Most of us who have had experience under workmen's compensation laws agree that there should be a special fund to compensate those having a previous loss of a member for the total disability resulting from the subsequent loss of another member.

In New York State we have felt that the special fund provision should be further extended so that compensation may be paid to

an injured individual even when the second accident does not result in total disability but only to the extent perhaps of half thereof; put him in the class of a man with one eye gone by a previous accident, or half of an arm gone, or very limited use of one arm, making it possible for him to be paid for his resulting partial but very large incapacity out of a special fund or some modification of a special fund.

With regard to the conclusion that men should be permitted to waive their rights under the compensation law when they have a constitutional disease or disability which is likely to be lighted up or aggravated by a subsequent injury in the course of employment, I feel that we would be treading on very dangerous ground if we took any steps in this country toward such permissive waivers, even when under the strictest supervision of accident boards and compensation commissions. A man may undoubtedly be suffering from tuberculosis or heart disease or any other constitutional defect—particularly arteriosclerosis, which I understand all of us in America have after we are 45 years of age—and therefore be entitled to waive compensation under the law, and be quite within his rights if such is the law of that particular State; nevertheless, we run into a grave social hazard if we do permit it.

I think in our effort to make the compensation practice an exact science, which those of us who have worked with it for many years are coming to do, we are apt to lose sight of the status of the workmen's compensation act. The intent of that law is that through insurance the cost of accidents to the injured workmen should be socialized, and that without regard to the cause of the accident or of the disability or without regard as to whether or not it was his own fault that he was caught in a machine because he had disobeyed an order. We have conceived it was an industrial accident in the course of employment and it was for the benefit of society that the cost thereof should be borne by society through a system of insurance. We built up an insurance pool against which all these accidents were charged and the costs were not inflicted on an individual employer, but socialized not only over the entire industry but over all of industry, and through that, as reflected in prices, over all of society. That, I think, is the purpose of the workmen's compensation law, to socialize the costs of the accident no matter what the individual's personal disabilities may be.

If the employee is a feeble-minded person and not able to coordinate sufficiently to work around moving machinery, we have still said he should be compensated for injury from an accident; so should a worker who has a heart disease and is subject to an attack or exacerbation of that by an injury. It is an economic situation. If an employee is able to perform any useful work and perform it well enough so that his labor will produce an article which the employer can sell for a profit, then any disability which results to him should be reflected in compensation—taking the burden of the cost of the accident off the individual and placing it where it belongs, on society.

If we go far in analysis of the psychology which has led us to regard these personal constitutional disabilities as preventing a man either from getting employment or from getting his compensation

if we make that the alternative, I think we will be bound to come to the conclusion that the institution of self-insurance in this country has been a mistake, and it has been through the fact that the individual self-insurer has felt the cost of the individual accident unduly.

We have had this question raised, in so far as any of us have participated in the pool, that we do not make a difference in the cost of Sam Jones's and Dan Smith's accidents even where one had a preexisting heart disease and the other had not. I think an organization such as this should tread with great care in this phase of the further development of the workmen's compensation law. We in New York State, associated in the management of the workmen's compensation funds, are quite opposed to the breaking down of the privileges, which now exist for an individual, of having the cost of his accident placed upon society.

Mr. PARKS (Massachusetts). I heartily agree with the principles espoused by Miss Perkins from New York as to why we have a compensation act and the theory of it and all that. As one of the earlier sponsors of compensation acts of these United States, I thought that was a splendid thing, but out of it has grown something which is very disturbing. I know it is disturbing to us in Massachusetts. Men are being examined, as horses were formerly examined when men wanted to buy a horse. In order to secure employment, the man must submit to an examination. That has grown out of the compensation act, whether we like it or not. We are dealing with a condition and not a theory. If the man is found with some defect which, if he meets with an accident, is likely to be aggravated and made more severe and thus increase the cost to the employer whose experience rating goes up as a result, then he does not want to accept that risk; and that poor fellow is met with the alternative of being deprived of a means of earning a livelihood or of waiving his rights to compensation.

Which is he going to do? It is a hard position in which to place the man. Of course we want him to get compensation. Everyone here agrees with Miss Perkins that he should be compensated for his injury, but how are you going to compensate him if he has no job? He will never get hurt. He is turned adrift. We have the case of the man who has fits, one who has a heart that is likely to stop any minute, one who has arthritis which is likely to be aggravated, one who has a hernia which is likely to become strangulated by the slightest effort. Those things are likely to happen to such men and the man is confronted with a situation where he can not get a job unless he waives his rights to compensation. What are we going to do about it?

On my board I stand almost alone on this subject. I opposed my board before the Massachusetts Legislature, in the last session, when it wanted to wipe out the waiver clause, section 46, in our act. I asked it and I ask Miss Perkins now and those who are against the last sentence in Doctor Pedley's paper, What are you going to do with these cripples—these defectives who are deprived of a means of earning their livelihood? What substitute are you going to offer?

You say, "Well, we will educate the employer." That will be the millenium. If we can convince the employer that he ought to employ all these defectives, then our problem is solved; but are you going

to do it? In our Commonwealth it is becoming so that more and more, every day, employers are discriminating, unfortunately, against these defectives, and it is becoming a problem as to whether they will become public charges or whether we will have some substitute in our act to take care of them.

I am and always have been against depriving any employee of his rights under this great humanitarian act, but what are you going to do with these defectives? As I said before, we are dealing with a condition and not a theory.

I do not know what they do nor what kind of employers they have in New York. Employers as such are much the same everywhere and deal with things much the same way. I do not think they are any better in New York than in Massachusetts, and if the employers are dealing with them any differently there and are willing to employ these defectives in spite of the compensation act, then I say "Amen" to everything Miss Perkins said. We have to do something for these defectives or we will have the country full of defectives unable to secure employment, and the compensation act, which was designed to benefit them particularly, is going to be a blank to them.

I think this is an important subject, this question of waiver. It is certainly debatable. I know I disagreed with most of my colleagues on our board about it and succeeded in convincing the legislature that my view of it was correct—it took that route, and I hope it does until the employers have a change of heart and stop physical examinations with the object of turning these defectives adrift on society.

Mr. McSHANE (Utah). May I ask Mr. Parks one question? I understood him to say that in his Commonwealth, notwithstanding the waiver clause in section 46, the defectives are being discriminated against. Did I understand him correctly?

Mr. PARKS. Yes; they are permitted to be employed through this waiver, upon application to our board, so that they do not go on the scrap heap.

Mr. McSHANE. Do you know, Mr. Parks, how many such waivers were granted, say, what percentage of the men who make application for employment secure such waivers or are granted such waivers?

Mr. PARKS. I have no exact figures, but I should say that 90 per cent of those who apply are certainly approved by the board. That is a rough estimate.

Mr. McSHANE. Of course this is a question of fundamentals, and of course you agree with that theory, but out of the application of the theory has arisen a matter that society evidently is not coping with. I still believe, with Miss Perkins and with the majority of the commissioners here, that this is a problem for education of the employer, and that when an employer selects a man he should intelligently select that man and place him in suitable employment; if that is done, I feel that the extra hazard of employing a defective man is very slight indeed.

I had occasion to make a comparison between two employers in our State, the International Smelting Co., which employs a large number of men, and the United States Smelting, Mining & Refining Co. The International Smelting Co. gives a very rigid physical examination, but asks for no waiver and turns no man down because of a

physical disability if something can be found, and usually something is found in the plant for him to do.

The other company turns men down. Waivers can not be taken in our State and the experience of those two companies is in favor of the International Smelting Co. It has fewer industrial accidents per man-hour exposure than the company which turns down the defectives.

I want to make one comment regarding the loss of an eye, which was referred to, and emphasize the statement that was made by the doctor. This smelting company—the United States Smelting Co.—employs a great number of men who have but one eye, because of the fact that if such a man loses another member, the company is charged only with the member that is lost while in its service, and the man is compensated out of the combined-injury benefit fund of Utah for permanent total disability, after the second employer has discharged his legal obligation. The experience in that plant for three years showed that the men with only one eye had a better experience than the men with both eyes, proportionately, because those with but one eye were more careful.

Mr. HATCH (New York). It seems to me that part of the answer has already been supplied to this problem in several States. The delegate from Utah has just indicated that it has the same practical answer that New York has, so far as major injuries are concerned. There is no motive possible under the New York compensation law which would lead an employer to discriminate against a man who has previously lost one arm, one leg, one foot, or one eye. That is the major list. In general, those are the most seriously handicapped men.

An employer in New York who hires a man with one eye takes on the risk for just one eye and that is all, but as Mr. McShane has suggested, we do not allow the man to sign a waiver taking himself out from under the compensation law and practically putting him on the scrap heap when he still has one eye. We say that if he has lost both eyes and has therefore become eligible for the scrap heap, we take care of him through another fund, as is done in Utah.

This whole question has been answered in several of the States practically by the provision of this second-injury fund, and we think, as Miss Perkins said, as a practical business matter the answer to this whole thing is an extension of that principle and that method to other combinations of a prior condition plus a new condition.

We are studying this thing in New York, and as far as we have gone in the way of practical investigation the indication is, first (this is tentative, of course; we do not have the proof), that the problem is not quite so large or so serious as is commonly supposed; and, in the second place, the extension of the second-injury principle to other than the major industries will not impose any great or insupportable burden on industry.

In other words, as far as we have gone, the problem is not quite so big as it looks at first sight, and to solve it by this method already tried and working to the satisfaction of everyone in New York State, is not going to be impossible or impracticable.

Secretary STEWART. How about the self-insured?

Mr. HATCH. They have to contribute to the second-injury fund just as anyone else. That is not the insurance fund.

Secretary STEWART. You take care of the self-insured, or is it from the State fund?

Mr. HATCH. We take care of the self-insured in exactly the same way; in other words, when the man has lost one eye and then loses the other one, industry is not breaking down under the burden in New York.

Mr. PARKS. We have the same provision in our law, section 37, that takes out of the State fund half the compensation due the employee, but in spite of that we still have the problem. My question is, Doctor, are men being discriminated against in New York because of physical defects or disability?

Mr. HATCH. Undoubtedly many employers are doing it, but we have reason to know that some employers are in a panic about it, and a lot of employers are not doing it. We know of one firm of considerable size in the State of New York which, adopting practically the suggestion which was made by one of the speakers, makes a business of hiring handicapped men and it claims that the result is that the handicapped man's greater care and greater concentration on his job have a good effect and are a strong motive for making its plant about the strongest in the State.

I think we have all been looking at this whole problem rather superficially. In New York we are studying it, under Miss Perkins's guidance, in an effort to find the solution, and our work so far seems to indicate that you can deal with this thing practically along the lines of the second-injury fund without any great difficulty and that the thing is not such a monumental affair to be dealt with by that method as many people have thought. Many people have said, "Oh, well, if you make a second-injury fund take care of every case in which a prior condition was a material factor in the man's disability you will bankrupt the State or the taxpayers will be called upon to bear an enormous burden." The evidence so far as we have gone does not indicate any such situation. It is widespread and a thing to be dealt with, no question about that, but we are coming to feel more and more that the correct answer, in principle, is the one we have already found in the case of major industries and that that answer is entirely practicable and one that can be adopted without any undue burden on industry, by which we mean a burden on society.

Mr. HALFORD (Ontario). Where do you get the money? Does it come from the employers, or the State, or the insurance company? I may say that we take it from a fund we call the disaster fund. We do practically the same as you do; we compensate for the difference between the two injuries and the total disability; in other words, the second accident is paid for in the usual way and we take the balance out of the disaster fund.

Of course, in Schedule II—people who look after their own compensation—that is a different proposition. We have no fund for those people. I should like to know where you get the money to apply for this. Does it come in the usual way?

Mr. HATCH. The second-injury fund in New York is provided precisely as our fund for rehabilitation of the handicapped man is. Ordinarily, when there are no dependents for compensation, without any special provision the employer would have to pay nothing. In

New York we say such an employer shall pay to the State \$1,000. Five hundred dollars goes into the second-injury fund and \$500 goes into the rehabilitation fund. That is the way the thing has been taken care of so far.

In attempting to deal with the extension of that fund, the immediate practical question has been, "Well, suppose you did extend this provision to all combinations of prior injury and immediate injury, how much would you have to tax employers further," or, if that were not the best way, how much would the State have to pay for it? We do not know.

We are trying to find out and to get some idea about it for next winter, but here again I could only indicate what the impression is that we have gotten so far. We are just trying to find out what additional amount in the second-injury fund we would have to have in New York to take care of the whole proposition. When we started we had an impression it was going to be a terrible thing, and industry had that impression. The latest impression we have is that it is not nearly so high nor steep as we thought it was going to be, and within 10 days I have heard that same opinion apparently agreed to by one of the important leaders of industry in the State.

When you get down to brass tacks on this thing, you are convinced that the principle of extension of the second-injury fund is entirely practicable and it is not going to break the bank, either.

Mr. HALFORD. I should like to say further, Mr. Chairman, that we have difficulty in solving that problem. We found the employers were absolutely averse to engaging a man with one eye or one arm, or anything of that kind, but after we decided to take the second-injury compensation out of the disaster fund, we didn't find much opposition to it.

I want to say also that we haven't had very many cases where we have had to go to the disaster fund for the second-injury compensation. We have had some, but not so many as people would think. Perhaps it is because such men have not been employed; nevertheless it has not been drawn upon to a very large extent.

We do not touch our rehabilitation fund for the purpose of paying for second accidents. That is entirely for rehabilitation of injured workmen.

Miss PERKINS. In New York, where we have had the fund for a long time, there are at the present time 90 or 100 cases charged against it out of a total of 150,000 to 200,000 adjudicated compensation cases every year—only 90 cases—so it is not so large a problem as it appears.

Mr. WILLIAMS (Connecticut). I note in Doctor Pedley's paper that he quotes the present Connecticut statute and quotes it correctly. It is now found in the Public Acts of 1927; it was slightly amended in that year. I drew up the original act in 1917. It was then a provision which nobody else had ever tried, so that we have been actually having experience under this waiver law since 1917. I fully believe it often happens that a laborer will discover on physical examination that he has something he didn't know about before and by proper medical treatment he can get great relief.

We have used this waiver provision very extensively. I should say that I have had over 10,000 of them in my office files alone.

There is one company which I think has about 2,500. I have never had a dispute arise over the terms of the waiver. The large self-insurers use these waivers more than anyone else and they do not use them for any improper purpose. It means that there are thousands and thousands of people in Connecticut earning their living and supporting themselves and their families who, were it not for the waiver statute, would be deprived of an opportunity to earn their living.

In the big concerns which use the waivers, after they find a man has a certain physical defect, they find him a job in the factory where that particular defect will not prevent him from doing his work.

I notice Doctor Pedley says he thinks it is possible in Connecticut for an unscrupulous employer to exploit a workman, since it is difficult for the compensation commissioner to examine individually each man who signs a waiver. I do not know what Doctor Pedley's experience in Connecticut was, but I know mine has extended since 1913 and all persons who come in there with waivers are individual cases. If the medical certificate on the subject of a waiver appears to the commissioner or his assistant not to be quite right, the man is sent to another doctor and another physical examination is made, and another certificate is brought in. It is not a routine matter at all. It would be susceptible to that charge if the cases were not dealt with individually, but the experience since 1913 is much more illuminating than a guess as to what might happen would be.

Mr. HATCH. May I ask one question? My old habit, born of statistical interest in these problems, leads me to this question. I should like to know in how many cases in Connecticut the men who have signed waivers have afterwards filed claims for compensation, and, when they have, in how many cases the claims have been turned down because the prior disability has been found to be a factor in it to a material degree. It strikes me you have a nice little question of adjudication and I wonder whether the man who has signed the waiver does not waive his rights under the compensation act many a time when he would be entitled to compensation. Do you know how it is working, Mr. Williams?

Mr. WILLIAMS. We have never had a dispute on it. A man who signs a waiver does not sign away his rights under the compensation law except as to the particular defect for which the waiver is executed. I have never known a dispute to arise about it. If a man who had hernia or an appendectomy afterwards drops something on his foot, he gets the same pay as anyone else, and we find that our people are fully aware of their rights under the statute and there is no dispute about it.

Doctor PEDLEY. I think that Miss Perkins has struck a note that has to be decided. If I interpret what Miss Perkins said correctly, I think it was this: There is no question about the second-accident fund being called upon in cases of previous industrial injury, but disease which is not industrial should not be placed on the second-accident fund.

Miss PERKINS. That wasn't my intention. Men should not be allowed to waive rights. They should, I believe, be treated under the special accident fund, recognizing exacerbation by an injury of a preexisting disease as part of the claim for compensation.

Doctor PEDLEY. My contention is that the second-accident fund should be extended to take care of preexisting disease, but you must have some way of assessing that disease before you can pay compensation, and the physician, rather than the employer, should be the one who establishes the particular degree of incapacity from the disease.

There has been a good deal said about education. I don't agree with it. If I put myself in the employer's place, I will not jeopardize the success of my enterprise with a lot of lame ducks, and I do not see why I should be called upon to do so. The workmen's compensation act is a social act and should be a good act, and I do not see why I, as an employer, should jeopardize the success of my industry.

Mr. McSHANE. Do you assume that the employer pays it at all? Doesn't society pay that as a whole, and the employer who takes these lame ducks and gives them jobs is simply an intermediary? He advances the money, but he gets it back by the sale of his products, and do you maintain that he does not add that extra charge to his product and pass it on to you and to me? Leave the employer out of it. Society is the one who bears this.

Doctor PEDLEY. The employer has a bad risk. He is assessed a higher cost in insurance and therefore he is in a bad position as against his competitor. The employers are afraid to employ handicapped individuals, and if the waivers and establishment of waivers are no particular burden to society, let us have them all the more, I should say.

Chairman KESSEL. Doctor Stack will introduce the next speaker.

President STACK. I consider it a privilege and an honor to introduce Mr. Joseph Bancroft, whose friendship I greatly appreciate. He was interested in the workmen's compensation law and the principles thereof long before Delaware had a workmen's compensation law, so much interested that from his own personal funds he contributed money that they might be studied and later drafted into an act in this State.

Mr. Bancroft is president of the Joseph Bancroft & Sons Co., which has large plants in Pennsylvania and a very large plant in Delaware. He is also president of the Huntingdon & Broad Top Railway, so his industrial experiences are varied.

An Employer's Recommendation as to Employment of Persons with Physical Impairment

By JOSEPH BANCROFT, *president Joseph Bancroft & Sons Co., Wilmington, Del.*

The title of the subject which was assigned to me to discuss was "The employer's recommendation," etc.,¹ which I have changed to "An employer's," because I can not arrogate to myself authority to speak for employers generally and am trying to give only the conclusions to which I have come by consideration of this complex question.

¹ The full title assigned was "The employer's recommendation as to what should be done industrially with the applicant for employment who has lost a member or who is suffering from a physical impairment either as the result of a previous accident or from constitutional causes."

There are two avenues of approach to any question dealing with employment and employment relations: (1) Economic; (2) humanitarian. The first should be followed in approaching this question, because to get at the truth sentiment must be excluded. The second method is too much controlled by sentiment, with little or no consideration for economic conditions, and the conclusions may be unfair to both employee and employer.

Since we are dealing with human beings the humanitarian point of view can not be eliminated, but should have weight only in the application of the conclusions reached by the study of the question from the economic viewpoint.

The conclusions to which I have come are based on economic grounds alone, and are also based on the present best practices in workmen's compensation as administered by industrial accident boards and commissions, and particularly as represented by conditions in Delaware, with which I am most familiar.

It is an unfortunate fact that into all industry goes a certain amount of human suffering causing disability, either permanent or temporary and which for the purpose of this discussion may be called human wastage.

Human wastage like all wastage should, by careful study and the application of scientific and business principles, be reduced to the irreducible minimum. We know by experience that by the installation of safety devices, by training the individual, and through courses of instruction the number and severity of accidents and the resultant human wastage can be materially reduced.

Under a just workmen's compensation law, well administered, the unfortunate individual who has his earning power reduced through accident is compensated, so that he does not become a burden upon the community at large, as was the case before the recognition of the economic principles underlying the enactment of workmen's compensation, but becomes a charge against the industry in which he was employed.

Human wastage in industry controlled by workmen's compensation laws is therefore charged into the cost of the finished product, which charge is paid by those who purchase and use it. In other words, like the salesman's suit in the expense account, this cost is in the selling price of the finished article although it may not be apparent.

The problem therefore reduces itself to the question of what can be done to utilize human waste and make it of economic value to the community and not a constant cost to the industry of which it is a by-product.

If the industry in which the human wastage occurs is a complex one, in all probability there is some place in the organization where it can be used at a profit to the business.

On the other hand, if the industry in which the waste originally occurred is a comparatively simple one, there may be no place where the damaged material can be used without either damage to it or the possibility of causing additional human wastage. In this case unquestionably the damaged material should not be used, but in a complex civilization such as that in which we are living all material can be used, and no bar should be placed against finding the proper place for its utilization. At the present time industry does not want

to assume the risk of employing a defective, for if he is injured the charge against the industry may be so excessive as to be punitive.

This condition being recognized, it certainly is not fair to handicap industry by paying the same rate of compensation to a defective, should an accident occur, as it would pay in the case of an uninjured person. Therefore the defective individual should assume part of the responsibility for any further injury, because he has already received payment for the injury previously received.

Without a study of the schedules of compensation it is not possible to give detailed recommendations as to what the compensation for an additional injury under conditions of this kind should be, but as a general proposition it would appear that compensation should be reduced in proportion to the effectiveness of the damaged individual with a normal person, because a person who has not all of his members or faculties is more liable to injury than one who is normal, and in employing such an individual the industry should not be required to assume more risk than it should with an uninjured individual, and as mentioned above the defective should under these conditions assume a share of the liability.

The same conclusions apply to the individual who is suffering from physical impairment as a result of a previous accident. He should be employed only with the knowledge of this physical defect and in such work as will not be a detriment to his giving full value for the wage received, and if by any chance this condition becomes worse, so as to cause complete disability, the employer who has used his best judgment in placing this individual should not be held responsible or required to pay additional compensation.

In general anyone suffering with the majority of constitutional disorders should be excluded from employment, for the effect of working conditions which are innocuous to a healthy person may accentuate these disorders and produce complete disability or even death, and in other cases such an individual working with others may be the cause of serious accident to them or of infecting them with his disease.

Constitutional disorders come in an entirely different class from physical disability acquired in industry and should not be considered as deserving compensation under industrial accident laws.

However, should a person having a constitutional disorder be employed in industry and injury or accident result therefrom, the individual should not be paid compensation on the basis of a normal person but on a similar scale to that paid persons disabled by previous accidents, provided that it can be shown that the individual was not employed with the intention of reducing compensation payments and thereby enabling the employer to reduce his financial obligations. Should this occur full compensation should be paid the individual, the excess above the usual rate to be charged directly against the employer and not against the insurance carrier, for the reason that such excess compensation should be considered as punitive against the employer assuming such risk, and because if charged against the insurance carrier it would adversely affect the rates paid by all other employers.

In conclusion, an applicant for employment who has lost a member, and who therefore has become human wastage, should not be debarred from being used in industry to his maximum value, and

compensation schedules should be so adjusted as to make his employment simple and attractive.

An applicant for employment who is suffering from physical impairment as a result of a previous accident, and who therefore has become human wastage, should not be debarred from being used in industry to his maximum value but should not be entitled to additional compensation in the event that the physical impairment results in total disability.

An applicant for employment who is suffering from physical impairment due to a constitutional disorder should not be employed unless the constitutional disorder is of such a character that it will not be detrimental to his fellow employees. In this case he should receive compensation on the same basis as an applicant who has lost a member. In the event that he is employed with the knowledge of his condition, with the intent to reduce accident insurance liability, he should receive full compensation, the excess over the regular schedule to be charged directly against his employer as punitive damages, the regular scale to be paid by the insurance carrier.

DISCUSSION

[The chairman read a communication from Mr. O. T. Fell, assistant general counsel of the Republic Steel Corporation, stating that he would be unable to attend the convention. His discussion of Mr. Bancroft's paper was read by the chairman, as follows:]

Mr. FELL (Ohio). After an experience of almost 20 years, or from the time compensation was introduced into the State of Ohio, I find I can say I have never known of compensation liability being deliberately considered as a bar to employment except in respect to three classes of cases.

I think large employers of labor quite generally examine for hernia and bar from employment those suffering therefrom. The risk of injuring others is considered such with this class of cases, I believe, that it is doubtful if hernia victims would be employed even if they were permitted to waive compensation. The practical answer to this class of cases seems to be an operation. Much industrial loss and suffering would be prevented if the State maintained at selected centers free clinics for the operation of hernias. Sufferers would be induced to seek a cure in the early stages of development.

In the State of Ohio and in most States employment at dangerous work is forbidden under certain ages. Under the Ohio compensation law violation of this provision resulting in injury formerly laid the employer open to action at common law and now lays the basis for a claim before the commission for a penalty up to 50 per cent of compensation payable. The risk that a youth between 16 and 18 who is employed at lawful work may become engaged in one of the prohibited activities is such that the compensation hazard is avoided as a rule by denying employment to anyone under 18.

A third class consisted of those who had lost one eye. The loss of the remaining eye constituted total disability, which is a serious liability under Ohio law. We met this danger by keeping men who had lost an eye in our service and refusing employment to those who had lost an eye elsewhere. By enactment of law it is now provided

that a one-eyed man losing his eye is entitled to compensation against his employer only as for one eye. After this is paid, compensation for permanent total disability is paid by the commission out of the reserve fund. This fund is built out of industry, and it might be difficult to explain why it instead of the community chest should stand this loss.

I have been impressed almost from the beginning with the thought that remedial laws such as the compensation law and the occupational disease law tend in theory to handicap the unfortunate. This theoretical tendency exists under so-called self-insurance or under any State fund which responds to the individual experience of the employer. Even under pure insurance where the experience of all insured are averaged, there remains the fact that employment of the handicapped and unfit will inevitably result in a higher insurance cost.

It may be rightly said that for his own good the handicapped and unfit should be employed only in restricted fields. Still, a man with diabetes or a faulty heart may have to make a living for himself. The former will make a very bad recovery from an injury and the latter may die from a slight exertion, yet the economic condition of the man may be such that he must take the risk. Must the employer also take this risk when by proper medical examination it may be avoided?

I am told that some railroads have adopted medical examinations which weed out such cases and follow up with periodic examinations and service to maintain physical condition among employees. So far as has been brought to my attention, no industry in our neighborhood has adopted so complete a plan.

A proper regard for social welfare should recognize this tendency and prepare a safeguard against it before its actual results are manifest. Such a safeguard can be adopted only after earnest and sincere study, and no study is more worthy of the attention of this body.

With reference to specific recommendations which have been made on behalf of an employer, I would suggest that the first class should cause little trouble. I feel the average dismemberment does not seriously increase risk of accident, but merely limits the field in which one may be employed. The second recommendation is sound. Injury to an impaired man should be measured by the loss it would cause a normal man.

The real problem will be presented by the third class. The doctrine of aggravation or acceleration which enjoys a growing popularity with commissions and juries will inevitably point out the folly of employing those who have a condition which might be aggravated or accelerated by an injury.

I have in mind the case of an electrician who claimed that dust from a polishing cloth irritated his eyes, which thereafter became infected with a disease from which he suffered at the time. The employer was held responsible for loss of an eye, although when application was filed later for the impairment of the other eye the responsibility of the employer was denied. In another case an employee returned two years after an accident and was operated on for a slow-growth tumor just above his heel. There was evidence

that the tumor was present at the time of the accident, but it was held that it had been accelerated or aggravated, and the employer was presented with the responsibility. In another case, a foreigner of an age and physical condition which should have kept him out of the mill stepped on a cover board, which turned with him. As a result, without any definite fracture or injury, he has been totally disabled since. The employer is paying compensation, though an ordinary man would probably have lost little or no time. An act of charity in keeping the old fellow becomes a serious burden.

Innumerable cases of this kind point out the fact that industry is being called upon to pay much for which it is not properly accountable. This is true under any form of insurance, because the awards when paid inevitably find their way into the rate. Industry should not be offered the dilemma of weeding out these handicapped men, or paying for that for which it is not responsible.

Reluctantly, I admit I have no remedy to suggest, though I have had the problem in mind for a number of years. I feel keenly that in some way these unlucky individuals should be protected from the handicap placed on them by legislation adopted for the benefit of labor as a whole.

Chairman **KESSEL**. Our next discussion, will be by Mr. I. K. Huber, of the Empire Companies, Bartlesville, Okla.

Mr. **HUBER** (Oklahoma). The title of the subject under discussion admits, by reading between the lines, that there is something wrong with conditions as they exist at this time industrially. Employers and employees are not on the same "level" as they were in the past—hence the call for recommendations "as to what should be done industrially with the applicant for employment who has lost a member, etc."

The writer of the paper here discussed graciously changed "The employer's recommendation" to "An employer's recommendation," and by the change gave to himself an opportunity to handle the subject from an individual standpoint, which can not be criticized, and the conclusions drawn are in accord with the reading of the subject.

As an adjuster, I looked for suggestions to put those logical reasonings into practice and to place employer and employee on the same level.

Let me consider this question as a Pennsylvania Dutchman interprets the English language. We read "as to what should be done industrially with." Here a Pennsylvania Dutchman stops and thinks, "What should be done with? What have we 'already' done 'with' the applicant 'once'? Nothing, and the one recommendation to give would take only three words—"set him aside." This recommendation will stand as long as industrial conditions remain as they are.

If I am permitted to change one word and read "for" the applicant, instead of "with" the applicant, I could offer a practical solution combining the economic and humanitarian avenues, as defined in the paper, into a common-sense view.

A great living utilitarian made this remark, "The thing we call common sense is the most uncommon thing in the world."

If there is no objection to the proposed change, I will continue a few minutes and change the recommendation "Set him aside." An

employer of many men expressed himself on the subject in this language: "Every industry has certain kinds of work which can be handled by older men or those with minor physical defects, and it is my recommendation that they should provide employment for such men rather than make them public charges."

Another one says: "Modern safety methods reduce the number of accidents, and an industry should take care of its own handicapped employees as far as possible." That sounds like common sense, but is not practical in Oklahoma for these reasons: 1. Legislators enacting law which is not as intended. 2. Commissions ruling as best they can. 3. Supreme Court decisions as to the meaning of the law. 4. Insurance carriers' requirements for accepting risks. Here recommendations are registered to have common-sense legislation.

In *Nease v. Hughes Stone Co. et al.* (244 Pac. 778), we find: "Where an employee who had previously lost the sight of his left eye received an injury in the course of his employment destroying his right eye, thereby leaving him permanently and totally disabled, held, that he is entitled to compensation for permanent total disability." In this case the commission ordered compensation paid for 100 weeks for the loss of one eye.

Nease brought an action in the supreme court to reverse and vacate the award. The case was remanded, with instructions September 15, 1925. Rehearing was denied March 23, 1926. Nease was compensated according to the decision and benefited. After the decision of the supreme court thousands of one-eyed, one-legged, one-armed, one-handed men in the State of Oklahoma were let out and can not get employment coming under the workmen's compensation law of Oklahoma. In the opinion, decisions of a number of States are cited, so the same condition may exist in other States.

In *Maryland Casualty Co. et al. v. State Industrial Commission et al.* (282 Pac. 293) the supreme court decision does not make employees jobless, but might make the insurance carrier or self-insurer penniless. Let us see how this decision works.

Take the case of a squint-eyed pipe-line walker; a gas explosion had slightly burned the poor eye, and the good eye was badly burned. The eyes tested as follows: Slightly burned eye, 40 per cent loss of vision; badly burned eye, 10 per cent loss of vision. The law reads, "For loss of an eye, 100 weeks." For the loss of both eyes, making a permanent total disability, 500 weeks is fixed. The order and award was 40 plus 10 per cent divided by 2, times 500, or 125 weeks' compensation. Common sense might say 40 per cent of one eye and 10 per cent of the other or 50 weeks' compensation. The man received compensation equivalent to one and one-fourth eyes, but had left three-fifths of one eye and nine-tenths of the other, or one and a half eyes. He received compensation of 125 weeks for one-half an eye. Thus far the case is true. I could give this man two more accidents—"a total permanent disability"—with awards for 900 weeks or \$16,200 compensation. With a hook on his left arm and with glasses, this man could walk more miles along a pipe line in a day than any man in this convention—"a permanent total disability," and absolutely compensation proof because only one "permanent total disability" to one man could be allowed, common sense would dictate. Yet this man, a one and four-fifths times a total permanent disability, is still a top notcher in his work. You can see by this case

that many such cases would make insurance carriers or self-insurers penniless, but the men would not be jobless. The recommendation now is legislation and placing employer and employee on the same level. This would be nothing more than common sense.

Chairman KESSEL. We will not have general discussion at this time. I will ask Mr. Bancroft if he has any closing remarks.

Mr. BANCROFT. I have little to add to what has already been said, except that in the previous discussion the idea seemed to be paramount in your minds that workmen's compensation is a social or humanitarian problem. As Doctor Stack said in his introduction, I have been a student of workmen's compensation for a great many years and I have come to the point of believing that workmen's compensation is right and proper from the economic point of view, because under the old idea of the liability of a fellow servant and the liability of an employee when he was injured, the cost to the community was excessive. Under workmen's compensation, the cost became a direct charge against industry and, as indicated in my paper, the study of working conditions reduced the number of accidents and the severity of accidents, and therefore reduced the cost.

The merit-rating system, as applied by the insurance rating boards, has been a tremendous incentive to the reduction of economic loss and human wastage, as the industry which studies this question and uses all possible means of reducing accidents receives the benefits of its work and is put in a more favorable position in competition with its competitors.

As I stated in my paper, we must in considering these questions look at them in a cold-blooded economic way and divorce, as far as possible, the humanitarian feeling. It is from that point of view alone that my paper was written and my ideas expressed.

Mr. DUXBURY (Minnesota). This is one of the most important things that has come before this association. Some of you heard my paper and might realize that the question we are now discussing was involved in what I had to say there.

We know that everyone has the spirit of the compensation law. We are agreed that a man should not be denied compensation because his disability arising from the work is more serious and more extensive than had he been a perfectly sound individual. That is a situation that must be met, but, as said so well by the member from Massachusetts, we have a condition and not a theory. I wish that the ideal expressed by the gentleman from Utah as to the character of the employers and their ideal with reference to their duties could be realized. That would solve the problem, but I do not hope to get employers to adopt that ideal this side of the millenium, and I am not expecting that right away. That will not solve it. You can not educate employers so they will assume that burden.

Another thing that interferes with that theory is the practice of self-insurers, so called. I do not call them that; I call them authorized noninsurers. Just as soon as you have an authorized noninsurer, the question becomes not a social question but an individual question for him, and unless he reaches the ideal expressed by the member from Utah he will determine it on a practical basis for his own interest. That will not solve it.

I have not assumed to be able to solve it. My paper, because of its reference to Mr. Wenzel's resolution, has resulted in a rather

lengthy correspondence between Mr. Wenzel and myself, in which we are about as wide apart as the poles—both of us undoubtedly wrong; but we have a condition and it has to be met, and it must not be met in a way which will prevent men from getting employment of that character because that would be a serious result. It must be met in some way by which these men can be employed.

I can see one thing that might induce certain employers who consider this thing to give employment to this class of help—they are looking for a market for their product, and if they will not permit men to earn, they will find the men can not consume. That might be an inducement to them to be more liberal, but that applies also to all instances of unemployment. Unemployment destroys the market and it is markets that are needed as well as everything else.

I am not so satisfied as some people seem to be that the principle of letting these people have the opportunity of waiver is to be condemned. If they are not proper subjects for the compensation system, there ought to be something done in a practical way so that they can get employment, because employment is the important thing, and if we have no better system than that of waiver, we had better do that, because we want to have these men employed. That is more important than anything else. If their physical condition makes them absolutely unemployable with the compensation privilege, then the consequences are they are not going to be employed. You can theorize all you want to, but that is the practical result. It must be met in some way. It is a practical question, one in which that uncommon thing known as common sense must be used, and while we may not get the ideal situation, we shall have to modify some principles that have gone into the law, such as authorized noninsurance and other things, before we can make it an absolute social question, one in which society should take care of these men as well as others.

Mr. PATTON. It seems to me there is a sort of confusion, evidenced this morning in the references to the socialization which has been brought about by workmen's compensation. All of us have the idea that workmen's compensation has socialized this burden and distributed the risk over society. As the American compensation laws operate, it seems to me that is not true. Under our merit-rating system, the compensation burden is not socialized over the entire industry in which the man is engaged. It goes right back to the individual employer; in other words, he is very much in the same position as Mr. Duxbury's authorized noninsurer, or self-insurer. The second thing I want to bring out is that I thoroughly agree with what was said by Doctor Hatch as to the extension of the second-injury fund to care for all these cases. Personally, I am as yet very doubtful whether it will be practicable. I should like to be more optimistic about it than I am.

A year ago a man called to see me. He was the employment man for a concern doing heavy work. His company had ordered him to institute a rigid system of examination for prospective employees. He said one of the best workmen he had ever had, who had had an injury before, had suffered a fractured leg. He received compensation for a fractured heel. The doctor said, "Never again let that man do heavy work. He has varicose veins to such an extent that he is likely to go at any time." The company immediately dis-

charged the man and he wrote, "I will sign any document you may wish. I will waive under the compensation law or my right to personal suit if you will only let me work," but he did not get the job back.

I said, "How many, up to the present time, have you discharged because of preexisting condition?" He answered, "Four per cent."

I asked, "What are the chief items?" They were hernia, heart conditions, high blood pressure, and varicose veins.

All of us are familiar with the war-time physical examinations. I doubt if any person in this room, any one of us, can pass a 100 per cent physical examination; in short, I am inclined to think that this problem of preexisting diseases or conditions, whatever you choose to call it, embraces a very much larger percentage of the total population and the working population than we are inclined at present to admit. At the same time, while it may be illogical, I am not at all willing to admit that the waiver proposition is the way to solve this situation.

Getting back to my original statement, I do think all of us ought to give more consideration than we have to the fact that when we blindly say workmen's compensation has socialized the burden, it is not the truth in the sense we ordinarily say it is.

Secretary STEWART. I want to say a word on the question of waiver that has been brought up. I wonder if we know what we are doing. We passed a workmen's compensation law which it was said was going to run capital out of the country and ruin everything. We thereby became blood-red socialists. We have now had the law some time and capital has not been driven out of the country, and for the most part it is very friendly to the workmen's compensation law. I do not think it wants to go back to the old doctrine of liability, even with the fences put around it.

Now let us see what you are doing. You passed a workmen's compensation law which was to distribute, which was to socialize, the expense of accidents in industry. For fear you might be doing what you said you were doing, you made a waiting period in some States of 14 days. Sixty-one per cent of the accidents in the United States do not last 14 days, so you eliminate from your socialization 61 per cent of the accidents in some States.

Forty-three per cent of the accidents do not last seven days, so nearly all of your States have eliminated at least 43 per cent of the accidents. Then you introduced the merit system of fixing insurance premium, which desocializes the whole business and gets away from the idea of charging the expenses in as part of the cost of production, as your taxes are charged.

Then along comes the waiver, and Mr. Williams tells us there are—I do not remember whether he said 2,500 or 25,000 waivers in Connecticut. The first thing you know, gentlemen, the workmen of this country are going to wake up to the fact that you haven't any workmen's compensation law, and they will wipe the whole infernal thing off the books.

Mr. HUBER. I did not want to discuss it any further, but there was a terrible stab made at self-insurance risks. In my discussion I stated that the insurance requirements as to risks ought to be changed. The Empire Companies employed a little over 2,000 men

at one time in construction work at East Chicago, Ind., and we sent about 180 men from Oklahoma there.

The insurance company wanted to displace 40 men—men who had worked for us four, seven, eight, or ten years. It said it could not take our risk if those men were employed. We went to Indianapolis and qualified to carry our own risk in Indiana, and the insurance company said it would take the men and it would be all right. I was glad the company did that because I didn't have the additional work.

You will find that the Kansas commission will tell you that the own-risk men give them the best satisfaction. The Oklahoma commission will say that. Their employees are better treated, are better and more promptly paid, and individual care is taken of them. That might not suit States which have State insurance and the like. Mr. Horner told me at one time their own-risk companies in Pennsylvania gave them the best satisfaction.

I do not want a stab made at the own-risk men in this convention. We employ more crippled men, we say, than any other company in the State of Oklahoma, because they are good, faithful men, and were good faithful men before they were crippled. We keep them, but we are running a risk. Those two court decisions put us in bad shape. We had 71 men who had only one member when that decision was made, and out of the 7,000 that were sent out, we didn't send 1 out. We didn't let out even one man with one arm or one leg who was employed, but the decision displaced between seven and eight thousand men in less than 30 days in Oklahoma.

Those conditions have to be changed by the legislatures. You must have legislation that is common sense, that will put the employees on the same level with the employer.

Chairman KESSEL. The work of rehabilitation is a thorn in the side of the compensation commissioner. We have with us this morning an authority on rehabilitation, and I take great pleasure in introducing Dr. C. P. Hutchins, who will speak to us for a few minutes on Rehabilitation.

Rehabilitation

By C. P. HUTCHINS, M. D., *rehabilitation expert Aetna Clinic, Syracuse, N. Y.*

I appreciate the politeness on the part of your officers and the resolution passed by the convention yesterday afternoon to interrupt your present discussion for a few minutes and take you back to a point previous to the discussion of the morning—that of dealing with the matter of seeing how far we can reduce each candidate's vocational rehabilitation by ameliorating the amount of damage.

Ten years or more ago the United States Government faced this problem with thousands of returned soldiers, more or less maimed. They had received in some instances excellent surgical attention and in some not so good—as good an average as we encounter in our civil life, however; but they paid the penalty of severed nerves, of scar tissue, of immobilization, and whatnot, the result of high explosives and machine guns.

Change, if you will, the character and nature of the injury, but in the main it does not modify it much; and so eight years ago in a

small way the company with which I am affiliated started to see what could be done to salvage the results of functional impairment. While small, the work has been earnest, and the record now runs about 1,700 cases. It is a drop in the bucket, yes, but it is based upon the fact that there are four cardinal principles in meeting the results of industrial damage: 1. Safety inspection service to prevent as far as possible the advent of injury. 2. Adequate first aid to prevent infection. 3. Intelligent surgery to conserve structure. 4. Intelligent after-care to conserve function.

It is of the fourth that I want to speak. It is manifestly impossible in the few moments at my disposal to give you more than a casual bird's-eye view. I wish I had the opportunity to sit down with you, as I have with our own commissioner in New York and with the commissioners of Connecticut and Massachusetts, and go over in detail some of the attempts we are making to deal with much that you have been discussing this morning. They deal with the underlying disease which has been lighted up by accidental injury. The injury itself would have been a small matter, but the underlying disease has made it a colossal one in many cases.

Seven years ago I had the opportunity to talk with the president of our company and told him—what I guess he did not know much about before—what we are trying to do. He said he was glad if we were able to make any economic saving in the expense of injury, but he was far more interested in the humanitarian side of it, and if we could tell him at the end of the year we had succeeded in getting 20 men back to the job, all he asked was that we would pay our own way.

We have succeeded. We have succeeded so well that a company the same size as mine, that is not insensible to the balance sheet, has found it advantageous to send us cases from Oklahoma, Texas, Illinois, and all through the Atlantic seaboard. The provisions of the compensation law have not operated to prevent it. We have received cases, a goodly number from Pennsylvania, where the amount of financial salvage is comparatively small, but we have never yet been told that we could not go ahead and do everything possible to redeem a man functionally, no matter what it cost.

As an illustration of that, some seven or eight years ago a young fellow, who by the way was engaged to be married and expected to be married at a date a week later than his accident, fell from an oil company scaffold in Watervliet, N. Y. He received four fractures of both legs, compounded. The surgeon who attended him gave him meticulous care and was very fortunate and very happy in succeeding in keeping him alive. The trauma was great, but when he recovered from the immediate condition, there was an internal angulation of the lower left leg and an external one of the right leg, so that this man did not have standing power. He was as nearly permanently disabled as one could conceive. We spent \$7,000 in medical aid on that case and the man received an award of 25 per cent of one foot and 33 per cent of a leg, and he was able to return to his task, which is the point I am trying to make.

This is partly secondary and reconstructive surgery, partly the study of underlying conditions such as disease and the results of the penalty we have to pay for the necessities of immobilization, the leg

union and whatnot, the scar tissue, partly due to the fact that we have an opportunity to run what might almost be called a convalescent hospital and to give intimate attention to our cases.

I have never forgotten and I shall not forget a remark Mr. Parks made to me at the end of a day. He said, "The thing that impresses me most with this work is the friendly spirit that is back of it." That has been the impulse all the way through and that is the impulse which we intend to carry on.

All surgery is not good. It is not conscious of ultimate function. Much of it is good, and yet, in spite of all the surgeon can do, there are certain penalties we have to bear.

Physiotherapeutics really came into being at the end of the war, in the reconstruction service. We saw 8,000 cases in one hospital at North Sheridan. It was a great training. It sifted physiotherapy right then and there to what it might be. We have had plenty of chance since to see what it frequently is, something to conjure with, in many cases with resulting disappointment. I want to say here that physiotherapy is exactly as much a part of the attempt to restore the injured man as the surgical element or any other single factor, but it is not a panacea, and the commission of the State must not allow it to become a dump by simply resigning these men to physiotherapeutic attention with the expectation that ipso facto there is to be a regeneration.

I count it a privilege, also, that in these eight years of application to injuries of the principles we tried to work out with the wounded soldier, none of these efforts have in any way affected my personal fortune. I mean by that, that there is no fee element in it to myself; that there is no restriction and never has been any restriction in regard to the amount of money that I chose to pay for X-ray studies or other X-ray work, or any other collateral treatment that might in any way be involved as a factor in keeping this man on the list of the maimed.

Chairman KESSEL. The next paper on the program is Psychiatry and Industry, by Dr. Frederick C. Robbins, of the United States Veterans' Hospital, Perry Point, Md.

Psychiatry and Industry

By FREDERICK C. ROBBINS, M. D., *United States Veterans' Hospital,
Perry Point, Md.*

It is said that a man to attain his highest efficiency must be in normal mental health and any factor that in the slightest degree prevents him from attaining this high degree of efficiency produces inefficiency. Our industrial machine is so complex at the present day that unless it operates at the highest degree of efficiency it operates at a loss and is unable to continue; therefore if the human element which is the basis of our industry is unable to produce, our social economy as regards industry falls.

Human behavior and emotion are so complex and are so intimately connected with our earlier life that unless they are at a normal standard the individual fails to function normally.

It is necessary to correct these faults, if they can be corrected, so that the human machine may operate correctly. The only way that

these difficulties may be ascertained and corrected is by means of a psychiatrist who has had special training in abnormal mental reactions. The mental reactions are so complex and our emotional life so difficult to analyze that only one with special training can understand to help solve the problems that arise.

Of late years much interest has been given to various methods of mental analysis and there has come about a welding together of these methods by American psychiatrists whereby the different theories are adapted to our American emotional life. We believe there is no one method of analysis and treatment that is infallible, but each case must be judged on its merits and treated accordingly; therefore a man who has spent much time and study of abnormal mental conditions is better fitted to assist industry than one who has not been so trained.

The United States Army has compiled from many campaigns the casualty statistics, so that the medical department knows under certain conditions what will be the probable load on the medical department; this has worked out in recent Army activities in spite of change in armaments.

V. V. Anderson, M. D., of R. H. Macy & Co., New York City, states that 20 per cent of the employees in mercantile establishments are problem individuals and are a drag on any organization. In 500 cases studied by him 67 per cent were still in the store and 33 per cent had severed connection with the firm; 40 per cent had been adjusted and 44.7 per cent still need office treatment.

A statistical study of mental disorders which has been carried out in great detail under Pollock and Malsberg, of the Mental Hygiene Commission of New York, shows the incidence of mental disorders for 100,000 population in New York State, and a recent study by Matz in the May, 1930, number of the American Journal of Psychiatry shows the future incidence of nervous and mental disease among ex-service men. The approximate number of mental cases that will need treatment is, therefore, a known fact.

When one uses the term "psychiatry" we are apt to associate frank mental cases with the question at hand, forgetting that all the shades of abnormal mental behavior or maladjustment come under the heading of psychiatry.

The time has arrived in our development of industry when it is well to stop and consider the human material in relation to mental hygiene. Without industry we would have no civilization in its highest development, and without the human element we would have no industry even in its simplest forms; it therefore behooves us to care for our human material, safeguard it well, protect and care for it, for in so doing we have preventive medicine functioning at its best.

When we talk of medicine in its relation to industry we first think of the accident room. At the present time that is a small part of our problem, for maladjustments enter into the question far more often than many of us realize.

The approach to the problem is best through a medical man or woman trained in the psychiatric field. Free rein should be given with no hampering from other departments. The psychiatrist need not necessarily be under the medical director in a given establishment but should, however, have a close liaison with the medical de-

partment. The head of the personnel department may be a psychiatrist, but I feel that the head of such a department has little time for helping solve mental problems. It would seem a better method to call the psychiatrist a consultant whose recommendations should be final as far as is consistent with the policies of a specific industry, always holding in mind the greatest benefit to the common good.

As has been stated the causes of mental maladjustment are many; likewise the remedies are multiple. We are prone to mistake alertness and affability for efficiency when it may be the exact opposite.

The study of behavior at the present time is at the forefront and of great importance, for by one's behavior we judge to a great extent the mental content. The varieties of behavior are of course multiple, but there is a border line beyond which the individual in his behavior may not go without serious consequences.

Abnormal behavior is dependent on so many factors that often it is difficult to ascertain the cause—it may be remote, in some physical ailment, in some home or marital condition; it may be financial; and it often lies within the working condition or environment itself.

A frequent cause of complaint by the worker is the unjust attitude of the arteriosclerotic head of the department. We are not far removed from the influence of alcohol as yet, and with the incidence of hardened and enlarged liver and hardened cerebral arteries, the mental symptoms that follow, while they may be insidious, are none the less of grave importance, not only to the individual affected at first hand but on the final output of the department.

The psychiatrist is often able to assist in overcoming mental friction in a specific department, for unless corrected it may be far-reaching in its consequences and detrimental to the specific industry. It has been found, too, that the difficulty which was thought at first hand to lie within the individual may be due to environment, a fellow worker, or his immediate superior. We may in routine physical examinations, if the individual passes under the eye of the psychiatrist, pick up incipient neurological conditions; even advanced cases of severe pathology of the nervous system have been passed by unless the nervous system was carefully examined. Close analysis is necessary to determine the remedy needed and not only plenty of time without undue haste but also facilities to carry out suggestion through a visiting nurse who has had special training in psychiatric problems. The approach to the case is often a delicate matter although it is astonishing how many individuals recognize they need assistance and go to the psychiatrist voluntarily. The psychiatrist becomes in a way a father confessor, for the majority of people realize their responsibilities and are desirous of avoiding pitfalls and obstacles in their progress through life.

This has been well shown in university life where one would hardly expect the young adult to request aid in adjustment, as at Cornell, Harvard, Smith, Vassar, Yale, and other universities where psychiatrists have been employed on the medical staff.

A list of a few of the problems is astonishing—it includes insomnia, indigestion, constipation, headaches, nervousness, difficulties with fellow workers and heads of departments, restlessness, inability to do their accustomed work, mental dullness, depressions, anxiety, sense-

less worrying, feelings of inadequacy, suspicions of all kinds and degrees, which to them are real physical disorders.

These troubles require careful sifting, that the pathological condition be treated by the medical man and the obscure and functional cases be sent to the psychiatrist for interpretation and treatment. These cases must be treated, for if they are eliminated at once from the firm they are not only often lost to industry but they become a social loss in our economy and may find it extremely difficult to regain their place in society.

We easily notice hilariousness, exaltation, or depressions, but the varying shades may be difficult to apprehend, although, strange as it may seem, the individual often easily recognizes the change and will apply to the psychiatrist for advice, if one is available.

Daydreaming and seclusiveness may be the beginning of a serious condition from which it is difficult for the individual to extricate himself even with assistance. Not that we should not dream, for the "castles in Spain" may help us over many dangerous pitfalls, but when it interferes with our daily life then it is approaching the border line.

Some individuals have small control over their emotions and it may require much study and treatment to assist them in adjusting. We may find that the individual is doing work beyond his mental capacity with the sure result of a let down in production.

It may be necessary to study the mental capacity by some form of intelligence testing. This is a procedure about which there is much discussion, but nevertheless one arrives at a conclusion that may not be controverted, that the individual has a mental level, and this gives the psychiatrist information that may be correlated with other mental analyses.

The frank mental cases require treatment at home or in an institution, preferably the latter. As soon as diagnosed the best plan is to forestall the complete mental upset if possible, and much may be done to prevent the loss to society of valuable human assets.

The psychiatrist should be consulted when advancement is made to key positions, or positions of trust, for why put an individual in a position where he is unable to carry on satisfactorily? Should a promotion have to be revoked, think of the often inevitable consequences not only to the individual's pride but in his later adjustment among his fellow workers.

The question as I see it is: Can a psychiatrist be of benefit to industry, how much benefit may he be, and will the benefits justify the outlay? As an economic question that is easily proven, for in preventive medicine anything that may be done in the line of prevention in the field of mental hygiene always justifies itself.

DISCUSSION

Chairman **KESSEL**. Dr. Richard H. Price, assistant medical director of the E. I. du Pont de Nemours & Co. (Inc.), of Wilmington, will open the discussion.

Doctor **PRICE**. Doctor Robbins has brought to our attention a subject which is of great importance to industry. It will undoubtedly

require some time to convince all employers that the mental as well as the physical health of the employees should be given attention.

Not many years ago organized accident prevention work was considered by the general public as an experiment of doubtful value. Even to-day the work of preventive medicine in industry is realized by only a few of the larger organizations which have been carrying on this line of work. The universality of guiding the worker in mental adjustment is still in the future, but we hope not too far distant.

Even more difficult than convincing the employers of the good results to be derived from mental hygiene work is the matter of selling the idea to the individual employee; in other words, to convince him that the mental counsel is to help him, not to find fault with him; but this can be accomplished if the work is carried on as it should be.

The United States Army and the Veterans' Bureau learned by a vast experience not only the necessity for assistance of psychiatrists in instances where men failed to adjust to problems of life, but also what might be accomplished by the same type of mental hygiene work which Doctor Robbins has recommended for industry.

It was my privilege some years ago to observe the splendid work Doctor Robbins was then doing at Cornell University in helping students who had difficulties in satisfactory adjustments to college life, and also in regard to vocational guidance; there seems to be no reason to consider the mental problems of men and women in industry as essentially different from those of college students or army personnel, and hence the same methods of solving such problems should be useful for our purposes.

Once having determined the need for psychiatrists in industry, our next question would be where to obtain them. The United States Public Health Service is at present expanding the work of its mental hygiene division and is apparently having some difficulty in obtaining properly trained psychiatrists for this work.

Very few organizations in the industrial field have employed full-time psychiatrists as yet. The R. H. Macy & Co. is one of the pioneers in this regard, but it is probable that the supply of men with psychiatric training will increase with the demand for these services, thus preventing any inability of industry to carry on this important work.

With the larger companies employing psychiatrists, the smaller organizations will be confronted with the problem of how they may be able to obtain similar services for their employees without the necessity for utilizing full-time specialists. A solution might be the expansion of group practices in industrial medicine with such trained personnel available in various lines as might be called on for work with either small or large groups of employees.

There are, of course, many phases of mental hygiene, so many phases that we can scarcely consider them all to-day, but I should like to ask Doctor Robbins to tell us a little more about how we may prevent the time-consuming method of promoting employees by the so-called trial and error method; in other words, giving a man a job and letting him try it for two or three years and then possibly having to demote him because of his mental inability to carry on that work.

In regard to accident reports, how often we find the statement made, "Accident caused by negligence on the part of the employee." In any such case might we not find the responsibility to be partly on the part of the employer in not having predetermined the right type of work for the man's particular mental capacity? It would surely be safer for a one-handed man to do certain work than one unable properly to control two physically perfect hands; therefore, the mental status of employees should be considered, I think, as well as the physical.

Doctor Robbins has given us a great deal of food for thought in his paper this morning, and it seems probable that many of his suggestions may well be carried on in industry.

Chairman KESSEL. The subject is now open for general discussion. If there is no general discussion, I will ask Doctor Robbins to close.

Doctor ROBBINS. I think psychiatry has come forward very much in the last two days in the newspapers. Those of you who read either the New York Times or the Baltimore papers about the fearful catastrophe that occurred in a certain office in the city of Baltimore the afternoon of day before yesterday, where one man shot another, killing him, and then shot himself, may realize that. Living fairly near there, I have, in the last 12 hours, heard some of the details. Supposedly, the president had constantly nagged the man under him, so much so that the man who did the shooting thought it was a personal matter and practically developed marked paranoid or persecution ideas. Whether the president was arteriosclerotic or under the influence of alcohol, I do not say; I do not know.

I want to cite a case at Cornell I had the privilege of observing, to show you how easy it is sometimes to arrive at the conclusion, and sometimes how far remote the cause may be.

A boy came into the office and he had a friend with him, as they so frequently do. I was talking to the boy and said, "You haven't had typhoid vaccine and you had better let me give it to you. You are going into the Reserve Officers' Training Camp and I should like to give it to you."

"All right," he said, and his friend, sitting near by, proceeded to faint.

"What is the matter?"

He said, "I always faint when anybody does anything like that, especially a doctor, or I see a drop of blood."

I said, "I will talk to you in a few moments," and when I talked to him I said, "What makes you faint?"

He said, "I don't know. I have fainted since I was about 12 years old. The least thing makes me faint."

I said, "I want you to do a little thing for me. Sit here quietly and go back to somewhere about your twelfth year. Do you remember any serious accident that happened, anything that rather frightened you?"

He sat there a few moments and said, "Yes, I do. I was at a boys' camp and two of us were on a little log raft in the middle of a lake. We had built this raft out of some logs we had nailed together the best we could. The boy with me started to dive off the log raft, and as he did so he caught his shin on a spike and tore a gash the whole length of his shin, cutting the flesh down to the bone. It was

fearfully bloody, and he took off his bathing suit and tied up the leg, around the knee, in the way he had been taught as a Boy Scout to stop the bleeding, and it stopped. His father, who was a doctor, was there at the camp and took care of the injury."

That was all there was to it, but that left a mark in that boy's emotional field which, while he had forgotten it, had made him faint every time he saw blood. I had the privilege of following up that boy, and, having had it explained to him, he had no recurrence of the fainting attacks.

Doctor Price wants to know what we should do to eliminate the trial and error method. The thing I have found best to do in the work I am doing at the present time is to subject the individual to a mental test. Binet and Simon, two Frenchmen, developed this method of intelligence testing and it has been developed by others so that at the present time we have a pretty uniform method of testing. We do not use it exclusively, but in this examination we test the memory, the imagination, and the reasoning ability.

I will give you one little example, and you can answer the question. Then I will give you the answer. The question is this: You have one large box; in it you have two smaller boxes, and inside of each, one box. How many boxes do you have all together? You have five, of course; but then the number goes up—5, 7, 11, 16, 21—to see if you can imagine these boxes and give the correct answer in a short time.

You might ask a man to repeat six digits backwards. It is easy. Surely it is easy if he is retentive, but ask him to repeat eight digits backwards and it is quite a little stunt. Try it sometime.

My idea, of course, is to sell psychiatry to industry. Much has been written about the subject. Much will be written. The question, as I see it is, as I have stated, how much benefit may the psychiatrist be and will he keep up or prevent loss of production. It seems to me that in fitting men, as we do in industry, for higher positions, not only the laboring man but the man who has ability to become foreman or superintendent, they should be under somebody's eye as they go along in the various stages to be sure they are doing something within their mental capacity; and you would be astonished sometimes to find how often the office forces have little maladjustments they are unable to reason out themselves without somebody's assistance.

[Meeting adjourned.]

THURSDAY, SEPTEMBER 25—AFTERNOON SESSION

Chairman, G. H. Gehrman, M. D., medical director E. I. du Pont de Nemours & Co. (Inc.),
Wilmington, Del.

Chairman GEHRMAN. We are fortunate in having with us this afternoon a man who is well versed in his subject, a man who is well known throughout the country, and he is going to give us a talk on Fractured Skulls and Their Permanent Manifestations. It gives me great pleasure to introduce Dr. John J. Moorhead, professor of surgery at the Post Graduate Hospital, New York City.

Fractured Skulls and Their Permanent Manifestations

By JOHN J. MOORHEAD, M. D., *New York City*

From a clinical standpoint we recognize that there are three zones of skull injury, viz.: (1) Fracture of the vault of the skull; (2) fracture of the base of the skull; (3) fracture of the vault and base of the skull. The commonest is zone (3) because nearly 80 per cent of skull fractures spread from the vault into the base, and vice versa. It is thus important to recognize and realize that practically 8 out of 10 skull fractures affect the vault and the base.

A further clinical classification recognizes two general divisions, viz.: (1) Skull fracture without brain injury; and (2) skull fracture with brain injury. The first of these is practically negligible as to permanent effects, for a fracture of the skull minus brain injury is of no real significance.

One more clinical division segregates cases into the following divisions: (1) Skull fracture with concussion alone; (2) skull fracture with hemorrhage; (3) skull fracture with brain laceration.

The concussion group usually recover without operation and may or may not have permanent aftereffects. The hemorrhage group usually require operation and there are generally permanent aftereffects. The laceration group rarely recover with or without operation; and in those who survive, the aftereffects are lasting and severe.

Thus there are several grades of clinical importance, and those named are sufficiently inclusive for a working basis in discussing our theme.

Generally speaking, the brain serves as headquarters for the motor-sensory activities; for the special senses; for the higher faculties such as memory, association, imagination; for equilibrium. There is probably no part of the body better charted, no organ more minutely studied microscopically and macroscopically.

There are sections of the brain relatively silent in the sense that injury or disease thereof fails to register in terms of any demonstrable defects. Again there are sections so important that the slightest variation produces tangible effects. This accounts for the apparent

paradox of severe skull injury with minor effects, and for minor skull injury with major effects. By far the greatest potential source of early or late danger in skull injury is involvement of the base, for here reside the organs of special sense, the respiratory and the circulatory mechanism. The next greatest site of potential danger is on the surface of the brain, especially the left half, for here resides the mechanism for the motor and sensory control of the body.

Let us then visualize some of the permanent aftergroups already mentioned. First we may divide our manifestations into objective and subjective signs, or their combination, for one rarely exists without the other.

Objective aftereffects are: (*a*) Motor symptoms such as weakness or actual paralysis of an extremity, as the arm or leg; (*b*) sensory symptoms such as impairment of sensation of an extremity; (*c*) special sense defects, especially as related to vision, hearing, taste, touch, smell; (*d*) circulation defects as related to the blood vessels and the heart; (*e*) respiratory defects as related to the breathing apparatus; (*f*) higher faculties defects as related to memory, speech, association, imagination; (*g*) epilepsy, insanity, melancholia.

Subjective aftereffects are: (*a*) Dizziness, vertigo, tinnitus; (*b*) headache; (*c*) insomnia, somnolence; (*d*) temperament; (*e*) habits, desires; (*f*) ambition; (*g*) hysteroneurasthenia (traumasthenia) group.

1. *Clinical group of skull fracture with concussion.*—Here the injury is of the most minor character and the chances of permanency are the least. There are usually no objective residuals after a lapse of a few days or weeks.

The subjective permanent manifestations, if any, relate chiefly to dizziness, headache, lessened ambition, and perhaps changes in temperament. These last may take the form of changed likes or dislikes as to persons or things. There may be alteration as to habits of speech, alteration as to desires, alteration as to personal appearance.

For this group suffice it to say that recovery is the rule without impairment enough to modify the working ability of the injured. If there is any residual defect, then clinically the case should properly be assigned to the next group.

2. *Clinical group of skull fracture with hemorrhage.*—Here the injury is of severer grade and operative relief may be demanded, so that there will be added the hazards incident to a defect in the skull following the trephining procedure.

The aftereffects will depend somewhat on the location of the fracture, but for the purposes of our discussion we will assume that there has been a fracture of the vault of the skull (parieto-temporal region) radiating into the middle fossa.

This regional selection is appropriate because the vast majority of skull injuries affect this area. It is understood, of course, that the average case is under discussion; namely, a patient operated upon for skull fracture associated with hemorrhage from the meningeal vessels, a so-called extradural hemorrhage.

This patient remained in the hospital six weeks and when discharged had some remaining weakness of the arm, he was unable to stand erect without swaying, he had definite vertigo, he complained

of headache and buzzing in his ear. His sleep was affected and dreams disturbed him.

There was a trephine opening the size of a half a dollar above and in front of his ear, and in stooping over he complained of pain in this area. There was a visible pulsation of the brain through this orifice in the skull. Six months later there was almost complete return of power in the arm, he had no ataxia, but his subjective complaints were still present but less in degree. A year after the injury he could not resume his regular occupation because of dizziness, headache, weakness on exertion. He was advised to work at some job that would not require climbing nor working above the ground level. He did this, and after a lapse of two years following the injury his complaints were limited to occasional headache, and the dizziness occurred only after marked exertion. There was now no visible pulsation through the trephine opening, but pressure on this area caused discomfort and nausea. Here was a case of permanent partial disability that with justice could be accorded a rating of 40 per cent by any group of surgeons.

In this same group is another case of hemorrhage due to a fractured base of the skull. No operation was performed. There was partial deafness in one ear, the sight of one eye was diminished one-half, and the same subjective signs of dizziness, headache, and weakness after exertion also pertained. After a year the hearing was practically perfect, but vision was still defective and the subjective signs appeared after working. Here an award for permanent partial disability of $33\frac{1}{3}$ per cent would be justified by any group of surgeons.

A third case in this group concerns a patient with a fracture of the vault of the skull spreading into the base. No operation was performed. Hearing, vision, and muscular power were involved, and the usual subjective complaints were in evidence. It was stated by his family that he was irritable, he had taken to violent dislike to one of his children, he had strange aversions as to food, and it was difficult to please him in the family relationships. Some of his friends regarded him as "queer" and he was no longer the hale fellow well met.

These manifestations were most marked for a year following his accident, and then they abated. However, his vision did not return, and he was still irritable and easily annoyed. He complained of headaches and dizziness and said that roaring noises annoyed him, especially at night when his sleep was disturbed. Here was a case in which surgeons would allot a permanent partial disability of 60 per cent.

3. *Clinical group of skull fracture with laceration.*—In this classification we have the severest manifestations, and in those who survive the injury or the operation, inevitable permanency ensues.

A case in point was a depressed fracture of the skull with splinters of bone imbedded in the brain, and radiating lines of fracture extended into the base.

Technically this was a compound depressed fracture of the vault and base of the skull with laceration of the brain.

There was paralysis of the arm and of the face; vision, speech, and hearing were much affected, and the period of unconsciousness

lasted many days. The patient was in the hospital three months, and when discharged speech was just returning; the paralysis of the arm and leg was decreasing, but vision and hearing were defective.

Six months later there was improvement as to the paralysis, but vision was much impaired in one eye and hearing was still defective. A year after the accident the paralysis was yet in evidence and vision and hearing were diminished and speech was halting. Memory was much affected and the power of association was almost lacking.

Subjective complaints of headache and dizziness were much in evidence, and his family stated that he was morose and melancholy.

His habits had changed, he was irritable, untidy, and avoided many with whom he formerly associated.

Here is an instance of permanent total disability because there had been actual destruction of brain substance.

These, then, are the three groups of greatest frequency, and again it is stated that this classification is arbitrary and subject to the criticism that it does not include border-line or atypical cases and to that degree is insufficient. However, this defect in the scheme is recognized and what is desired by me is a presentation to you that covers the average type of skull fracture.

There are, however, certain outstanding sequelae that arrest our attention, such for example as epilepsy, insanity, and hysteroneurasthenia.

Epilepsy as an aftereffect must be exceedingly rare because genuine post-traumatic epilepsy is almost unknown in the surgical groups with which I am associated. Personally, I have not encountered such a claim in many years, and certainly the statistics of war hospitals rate epilepsy as one of the very rare end results of even the severest type of head injury. We are therefore justified in believing that post-traumatic epilepsy is to be regarded as a most unusual sequel.

Insanity following skull fracture is also rare and is no longer regarded as a sole producing factor, except under unusual circumstances. In alcoholics, in syphilitics, in the mentally unstable, a head injury may upset the disturbed balance and precipitate the inevitable. But the point is that post-traumatic insanity is not nearly so common as we formerly thought it to be. Here again war statistics accord with the experiences of civil life.

Hysteroneurasthenia of traumatic origin (called by me traumasthenia) is relatively common by comparison with the preceding. However, the better the surgeon or the neurologist the less often the diagnosis "traumatic hysteroneurasthenia." It does occur to be sure, but by no means is it encountered as frequently as hitherto. The chances of permanency are slight and one of the best cures is a prompt award and closure of the case. Here it may be pardonable to interject the statement that you compensation commissioners have the facility often for preventing as well as curing many manifestations of this hysteroneurasthenia type. What follows is in part from the writer's forthcoming book entitled, "Traumatotherapy: The Treatment of the Injured."

You hesitate to exercise this settlement privilege because of possible damage to the claimant; but as a matter of fact, you do more harm to the claimant than good by postponing a final award.

It is unfortunate that our system is as yet so imperfect that one examination by one surgeon or one neurologist is in such conflict with the repeated examinations of the surgeon or neurologist who had this same case from start to finish.

You as commissioners have a rating as to the surgeons and neurologists in your respective communities. This rating is very properly based on your past experience, and you naturally have great respect for those practitioners who are highly spoken of by their injured patients. You men of experience realize that the doctor in attendance daily is in the best position to render a final opinion. You realize also that hospital doctors as a rule are acting in the best interests of their patients, and that when a patient is certified as ready for duty by such a doctor, your inclination is to accept that opinion. Unfortunately, when the patient is discharged from the hospital, all too often outside interests interject a new element into the case, add something by suggestion or otherwise, and the whole picture changes.

This happens to be sure in any group of the injured, but in skull injuries in particular the practice is especially common. The patient becomes suspicious of his former medical advisers, he perhaps now mistrusts them, and thus becomes the victim of many subjective symptoms that never existed during his stay in the hospital. Your decision in such a case is made the more difficult by the introduction of this new evidence by an outside doctor imported to give so-called expert testimony. Naturally, before you make a final award you seek all the available high-grade medical data and accordingly you select for yourself a specialist competent to pass on the hospital data and the additional testimony. Then you sift it all and settle the matter.

The point stressed is that in skull injuries the subjective symptoms equation needs decision, otherwise the indecision of the patient may be increased to such an extent that traumasthenia will be firmly established. And in this present day of too many men for too few jobs, this problem looms large and requires of you maximum diligence.

Before concluding, let me say a few words as to the effects of head injury in those already substandard as the result of age, physique, or associated disease. A patient with high blood pressure (160 or over) is not a good risk in a head injury, especially if the arterial disease is associated with changes in the heart or kidneys. Diabetics are also poor risks. Sinus disease or ear disease also adds to the hazard because of the possibility of causing meningitis. Syphilis is also a bad factor. Alcoholics are notoriously poor risks. In a word, the coexistence of disease of this sort beclouds the outcome of the original surgical lesion and is very likely to add to the disability.

Finally enters the personality of the patient, his morale, his cooperation, his will to get well. There is no question as to this being a factor of greater importance, and it was this element that made the war wounded the best group of patients any of us ever attended. The spirit of "I won't give up" is a factor in every injury; but in head injuries it is paramount, and with it many a man can rise superior to handicaps that would in another mean permanent invalidism. There are plenty of good surgeons and plenty of good

commissioners; but there are too few in either class who are able to arouse in the injured that divine spark of courage which so stimulates and arouses that the battle is won thereby.

To summarize:

1. Skull fracture with concussion is usually unimportant from a compensation standpoint because recovery is the rule.

2. Skull fracture with hemorrhage usually means permanency of some degree.

3. Skull fracture with laceration usually means permanency of considerable degree.

4. Skull fracture with combinations of the preceding usually means permanency of considerable degree.

5. Skull fracture with subjective symptoms usually falls into the hysteroneurasthenia group and in these a prompt final award is one of the best forms of treatment.

6. The opinion of the attending surgeon in a given case of head injury should usually be the best medical evidence as to the original and subsequent condition.

DISCUSSION

Chairman GEHRMANN. Dr. Francis C. Grant, assistant professor of neurological surgery, of the University of Pennsylvania, will open the discussion of Doctor Moorhead's paper.

Doctor GRANT. It is a little difficult to discuss a subject that has been covered as well and as completely as the matter of head injuries has been by Doctor Moorhead, there being not much left to say. There is, however, one phase of his subject which has been of particular interest to us through our association with Doctor Frazier in the clinic of the university hospital. In this clinic we have seen a good many head cases, and cases are sent to us for post-traumatic diagnosis and treatment.

In our experience two of the common reasons why patients do not return to the same level of economic efficiency, post injury, they had prior to the time of their injury, are headache symptoms and symptoms of vertigo. Headache and vertigo, those two things, in our experience, have been the bugbear of these post-traumatic cases. Furthermore, it is very difficult to be sure whether or not headache and vertigo are due to a functional or an organic type of lesion. Very careful neurological studies fail to reveal evidence of organic lesion to account for the headache. That is the type of case which has been so ably called traumasthenia, I believe, by Doctor Moorhead, where you have no definite organic evidence of injury to the brain, but the patient comes to you rife with complaint and two of the principal complaints are headache and vertigo.

About two years ago Penfield, of New York, in describing his results with lumbar puncture and an introduction of air in the ponsubarachnoid space, so-called "encephalograms," found he had cured five out of seven cases of headache connected with previous injury in which an encephalogram had been done. Boyd, of Chicago, has also reported definitely favorable results from this treatment.

From the university hospital, as reported about a year ago by Gardner and myself, there were at that time 36 and there now have

been over 50 cases of encephalograms done on post-traumatic head injuries for the purpose of attempting to relieve headache and vertigo. These cases have not been followed, it is true, for a sufficiently long time to be certain as to the permanency of the results. Furthermore, I am too conservative to wish to claim what may seem to be too great a success with this procedure, but our follow-up statistics, which have run now, some of them, between two to two and one-half years, show that approximately 65 per cent of these cases have been relieved, so that while the patient may not have been able to return to exactly the same job that he had before he was hurt, he has at least been transformed from a man who was unwilling to attempt any type of work to one who was agreeable to trying out a job to see whether or not he could stand it. As Doctor Moorhead has said, if you can get these fellows working, sooner or later they are almost certain to build themselves up; their confidence comes back, and they restore themselves slowly to their previous tasks.

What is an encephalogram? It is, briefly, a lumbar puncture, the removal of the cerebrospinal fluid, the replacement of that cerebrospinal fluid, volume for volume, with air. You remove 125 to 150 cubic centimeters of fluid from the spine and replace it by an equal amount of air. Exactly what the therapeutic effect of that procedure is I do not think we know. The theory of it is that it breaks up adhesions and restores the cerebrospinal fluid circulation and in that way prevents or removes the factors producing the headaches.

I think, too, that the psychic effect of that procedure—which is an uncommonly unpleasant one in a good many cases, gives the patient a fearful headache, knocks him out for 24 hours—that of itself and the assurance on the part of the physician that the patient is going to get well, may have a lot to do with it. Nevertheless, I am quite sure that I can report 65 per cent of success with these cases, probably 20 per cent were not affected in any way, and a possible 10 per cent or less may have been made a little worse.

Another thing that the encephalogram does is this: Inasmuch as the air, the shadow of the air, can be shown up in an X-ray plate within the skull, it gives you a fairly definite idea as to the changes in the subarachnoid space, the changes in size and position of the ventricles, and an idea of the degree of damage done to the brain.

When a patient complains of a tremendous amount of symptoms but gives you a relatively normal encephalogram showing the brain not injured and subarachnoid space not interfered with, this will lead you to the suspicion that there is a large amount of traumatism connected with the case.

So I simply make this suggestion to you, that possibly in these cases of headache and dizziness following on trauma, the beneficial effect of encephalography be kept in mind. It is not the panacea that a number of persons have claimed for it, but it does unquestionably benefit a certain percentage of these cases, particularly those which are taken early in the game. The chronic headaches which have lasted for years are not much affected, but a man with a cranial trauma, who is put on his feet but does not go back to work and says, "Doctor, I can't work; I am too dizzy; I have a headache; I have vertigo," is a good subject for an encephalogram. An encephalo-

gram would do that man no harm and in a relatively high percentage of cases it may greatly relieve the subjective symptoms of which he complains and which are preventing him from returning to his job.

Chairman GEHRMANN. Next on our program is Dr. James G. Spackman, of Wilmington, who will continue with the discussion on this subject.

Doctor SPACKMAN. I am probably sailing under false colors this afternoon in attempting to discuss a subject which is so bound up with neurology. I am neither a neurologist nor a neurological surgeon, either by training or experience; however, there are one or two things I should like to mention about this subject.

It seems to me that as to the subject of fractured skulls it is realized by everyone that the situation differs markedly according to the location in which the injury occurs. For instance, a small city the size of this—150,000—rarely has a hospital which maintains a resident consulting neurological department. When I say “resident” I mean in the city. So there is a vast difference between the handling of a head injury in New York City and at the University of Pennsylvania, and in a small town of this size or smaller, and it is along those lines I should like to address a few brief remarks.

It happened to be my good fortune to spend four years as a resident surgeon in a hospital in Philadelphia where we had an average of 1,500 accident cases a month. At one time, due to a sleet storm and the prevalence of whisky at 5 cents a glass in Chinatown, we had 40 fractured skulls in one month.

It has always seemed to me, as I move about the country, in smaller cities, and observe how things are carried on, that too many of us at the present time are still pursuing the same treatment as at the time I mentioned, which was 15 years ago; and that is what led me to remark that there is a vast difference between the treatment of a head injury in a large, metropolitan hospital, particularly if it is a teaching institution, and the treatment in a smaller city.

So many of these cases are admitted in shock, pulse rapid, skin cold and clammy. They are unconscious. I should like to know what percentage of them are down in the X-ray room within an hour after the time admitted. It certainly must be high. I can not see any advantage in rushing in a patient with a head injury and putting him immediately in the X-ray room, except to satisfy your curiosity and show the accident board the patient has a fractured skull. So far as he is concerned, or the treatment is concerned, it makes absolutely no difference. So far as the patient who arrives in that condition is concerned, treatment for shock is better than treatment for anything else.

In one hospital through which I went I think over 60 per cent were rushed to the X-ray department. The hospital had an ambitious surgeon and before the patients' feet could get warm in the bed they were in the operating room, and somebody was industriously engaged in making an opening in the head. I am afraid such a procedure, with perhaps minor variations, is far too common to-day.

It seems to me the treatment of head injuries as we see it conducted in hospitals which do not have an elaborate staff with more modern procedures, such as first the treatment for shock, if the patient is

shocked, and then repeated lumbar punctures, is not to be compared with the other treatment. I wonder how many institutions treat head cases and yet do not own a spinominimeter. Introduction of magnesium sulphate by rectum and mouth gives a far higher percentage of well patients than if they are rushed to the operating room and have a head operation.

I don't know how many of you had an opportunity to hear Bagley's paper in 1927 in Washington. I think Doctor Grant discussed it. The motion pictures were very illuminating. It was animal experimentation, the injection of blood in dogs, with a resulting diminution of control and atrophy, which followed six months or a year after injection. How much more we are able to do the first four or five days when a patient does not come into the hospital and does not fall under the classification which we at least use for surgical treatment, namely, compound fractures of the skull, with foreign bodies, depressed fractures of the skull, not small, but causing some actual focal involvement, and focal hemorrhage. Those are our classifications for surgical treatment.

The other class is lumbar puncture, repeated—because we think Bagley's work is sufficient at least to give it a long-continued trial—with the use of the spinominimeter; we endeavor to drain off the bloody spinal fluid, and it is bloody and becomes less so on the repeated lumbar punctures, restricting the patient's fluid intake, because the more fluid he takes the greater the volume of cerebrospinal fluid.

That is certainly preferable to taking those patients to the hospitals or operating room and operating because they are unconscious, have bloody spinal fluid, and the X ray shows a fracture of the vault of the cranium.

The CHAIRMAN. We will now open this paper for general discussion.

[A motion was made, seconded, and carried signifying the debt of the association to Doctor Moorhead for his excellent paper.]

Doctor KESSEL (West Virginia). There is a question I should like to ask Doctor Moorhead. He stated that in a skull fracture with concussion the injured employee usually got well. Frequently we find certain symptoms such as headache and dizziness following these cases, and in these cases Doctor Moorhead suggested a settlement. On what basis should we settle with that type of claimant?

There is another remark I should like to make, concerning the encephalogram. It is quite true some of our leading clinics throughout the country have had very marvelous results with the encephalogram. During the past year we have tried some 50 cases of encephalogram, and I hesitate to state that in not a single case have we had permanent improvement. We have repeated the encephalograms some two or three times in some cases, but we have not had a cure in a single case out of the 50.

Secretary STEWART. I should like to ask one question in regard to Doctor Moorhead's paper; that is, if you abolish the lump-sum settlement, don't you abolish the lump-sum neurosis? Would the fellow, after he was dismissed, get the outside doctor to tell him he wasn't well and must have a lump-sum settlement, if there was no such thing as a lump-sum settlement, and would the outside doctor be looking for that job if there wasn't any money in it?

In the first place, the workmen's compensation law was not intended as an adjunct to surgeon's methods of practice. It is not our business to furnish a supplementary remedy for diseases which their practices have created. We are not helping ourselves by creating a new disease, a new occupational disease, a new industry hazard, by adopting the lump-sum settlement scheme in further destruction of the workmen's compensation law.

Doctor ROBBINS. The United States Government, especially the Veterans' Bureau, has among post-traumatic cases many of these cases, which come into the Veterans' Bureau for adjudication or for analysis in order to find out whether the man really has some symptoms—cases especially prior to January 1, 1925, what we call "service connected." We have many cases come in which have been diagnosed outside as possible traumatic conditions, and we have found that the best way is to analyze the cases very carefully, especially those of many years'—at least 13—duration. We find out whether the man from his social history might not have been a mental defective and, with increasing stress in industry, he is not able to qualify, and consequently the traumatic condition had nothing to do with the mental enfeeblement, as all mentally enfeebled and feeble-minded are pushed down hill gradually. Many are constitutional psychopathics and have a tendency toward chronic alcoholism, toward becoming pathological liars and hoboos, and so forth. It is astonishing to find out how some wandered over the country and it has been said, "Oh, he did it because he was hit on the head with a piece of shrapnel," but we have found on analyzing the case that before the history given he was of the type that would easily become a hobo or criminal.

Mr. PARKS (Massachusetts). I suppose a layman should not attempt to discuss this paper, but even a layman knows something after listening to doctors, and I was interested in what Doctor Spackman said, especially when he said he wondered why the doctors rushed the patients down to the X-ray room to see if they had fractured skulls, instead of treating them for shock. I am reminded of a case that came before me. The business agent of the teamsters' union came in to tell me about the death of a colored man, and he wondered if his work had something to do with his death. He gave me the name, and so forth, and I had an investigation made. I got the hospital record and it read something like this: He had come into the hospital on one day and then three days later there was another injury. The first day they said he came into the hospital with a lacerated skull, and three days later he came in and they said he had come in three days before drunk, with a fractured skull.

That immediately excited my suspicions and I had our medical adviser make a personal investigation and he got the staff of that hospital together. The outcome of the investigation was that the doctor who had seen that case first, to use a slang phrase, had flubbed it. He hadn't detected the man had a fractured skull and therefore the man went without treatment. He went into a state of coma and died, and the doctors said, after looking into the matter, that if that first doctor had diagnosed the case correctly as a fractured skull, the man could have been treated for it, and perhaps his life would have been saved.

Of course, the outcome was that I had a further investigation made and found out that the evening that he went to the hospital, he

had had an accident at the coal yard. The hospital interne had in the record, "Drunk." The man had been seen to fall when putting up his horse and the horse had kicked him in the head. A fellow-workman saw that happen, so we were able to connect it up and we got compensation for that colored widow.

I was interested in the other side of that story. The man went without treatment for three days and they say if he had had the proper treatment, based upon a correct diagnosis, he probably would not have died. I do not know how that fits in with what Doctor Spackman said, that perhaps it is a waste of time rushing these patients into the X-ray room to find out whether they have fractured skulls; that the doctors should go ahead and treat them for shock.

Doctor MOORHEAD. I didn't know I was going to start anything like this. After all, the topic of my paper was the end results of fractures of the skull in respect to their permanency, and I didn't know we were going to get into the treatment of fracture of the skull, the differential diagnosis of fractures of the skull, or coma from drunkenness.

However, in regard to what Doctor Grant had to say in respect to the use of "airograms" in connection with relief of some of the post-traumatic lesions, I think it depends very largely on the management of these cases as to whether or not they are compensation cases. There is a large group of compensation cases that will continue to complain of subjective symptoms no matter what is done for them, in contrast to another group of cases, hurt as a result of their own fault with an identical injury, and of the same general type of physique, that will respond to a line of treatment that the other will not respond to at all. I tried to make mention of that in connection with the morale of the individual. We have created, under the influence of the compensation law, the same set of cases that we used to have in the old common-law time when people sued railroad companies and contractors and other types of people, whether employers or not.

My observation is the same in regard to that as it is about compensation cases. So long as the motive exists in the mind of a given individual of a special type the subjective symptoms will exist, and I tried to stress that in my remarks here, stating that I believe you commissioners have the opportunity of helping not only the injured man, but also his associates and us as well, in clearing up a great many of these cases by a proper award when you come to the conclusion, based on the medical evidence that the individual is suffering from a hysteroneurasthenic complex and the pathologic side of his case is at an end.

I do not undertake to say commissioners shall enter the practice of medicine nor that we shall enter upon the duties of commissioners, but I believe a mutual relationship has been created by the new law. A great deal of good can come if these cases are not carried along to infinity, as they are too often, against the interests of the individual himself, and not only of that individual but also of the man at the bench next to him or some of his other associates. We all know that one of the best means of treatment in this traumasthenia group is a cessation of any kind of litigation, and compensation is practically the equivalent of the litigation of the older days.

In respect to "airograms," our experience in New York has not been so favorable as that of Doctor Grant in regard to relief. I am familiar with Doctor Penfield's results and, again to revert to the different types of morale as between the compensation case and the ordinary kind of case, in the compensation case one must not expect to get the same sort of relief from the same treatment as he would in the ordinary case.

As to what Doctor Spackman said, I am entirely in accord with him as to his classification as to the type of cases that should be operated on. I believe personally fractures of the skull should be operated only for three major operations: (1) Depressed fracture, (2) accessible hemorrhage, (3) foreign body. Other classes of cases are not, in my experience, benefited by operation.

Multiple spinal punctures, injection of hypertonic solution intravenously, magnesium sulphate or a saturation of a variety of things, glucose also, are other treatments.

In respect to shock, I think a patient coming in under shock presents the primary consideration of taking care of the shock, and we all know that in head cases, as well as in spinal cases, the mortality rate is greatest in the first 48 hours and if a patient passes the first 48 hours his chances of recovery are very much greater.

In regard to Doctor Kessel's question as to what kind of settlement should be made in these cases of traumasthenia, I think settlement should be made for a post-traumatic traumasthenia arising out of a head injury in the same way that the post-traumatic injury is settled for, on a low basis of partial disability, and the sooner they are settled after the objective symptoms have subsided the better for the individual and for all others concerned.

As to Mr. Stewart's question as to whether a new type of occupational disease would be created by this lump-sum settlement proposition, that is a large-sized question to put to me, and again I revert to the observation that has been made countless times long before the compensation law came into effect and many times since, the observation that Major General Gilchrist can give you with respect to the war wounded. We had hundreds of them come in, especially after Chateau Thierry and the Argonne offensive, with diagnoses of shell shock, and what did we do? We made a careful examination, and if there was no objective injury we marked them for duty and sent them back in the line. That stopped the influx of shell-shock cases and the manifestations of it.

What was shell shock? Traumasthenia—exactly the same thing you get from a head injury or back injury, exactly the same thing you get from an ankle injury; and what was the background of it, the motive? What did they want to do? Get out of the front line. And what was the thing to do? Send them back on the job. It stopped the influx and the manifestations.

In respect to what Doctor Robbins had to say in regard to the constitutional tendency of a great many of these people, of course, that is true. These people who have a susceptible nervous system are born that way. Sometimes they are made that way by environment, but unfortunately we have to take them as they come—we can not make a psychological study of them before they are employed—and that is enough. No injury should hurt a person with

an unstable neurological mechanism more than it does a person who has a sound one.

In respect to the cases spoken of by the commissioner from Boston, one of the most difficult things in the world to do is to make a differential diagnosis as between a comatose condition as a result of head injury and one as a result of alcoholism, or epilepsy, or some drug, or kidney disease. By a very strange coincidence, in New York there is a convention now of fire department surgeons and police surgeons and on Saturday morning I am to read a paper before them, and the topic that I have chosen for my remarks is "What type of case shall be brought to the hospital?" I stress that very thing, that when a patient is found in a station house or on the street in an unconscious condition, one of the first things to be done is to rule out the possibility of a head injury, and in the hospital, of course, these cases are passed through without being diagnosed, but to be able to make the diagnosis on inspection or even by the most exhaustive tests in some of the cases of unconsciousness, a sufficient lapse of time, 48 hours, is oftentimes an impossibility.

I have no desire to introduce any controversial matter into this subject or into this discussion at all. I come before you as one having grown up with the compensation law. I have been for over 25 years in association with injured people. I have had my opportunity of seeing a wide variety of the injured, and what I have tried to do here this afternoon has been to pick out some of the high lights, based on my own personal experience, in connection with the aftereffects of this group of skull cases.

Chairman GEHRMANN. With the progress of the chemical industry, we are more and more frequently being faced with those cases which give a history something like this: "I am working for so-and-so, and I inhaled some fumes and as a result"—and they claim all sorts of injuries from total disability to tuberculosis and many other constitutional conditions.

During the war we had a great opportunity of studying this particular type of case and finding out just what actual damage was done to these cases and just what the permanency of these effects might have been. One of the men who has had an opportunity of studying this more than anybody else is Maj. Gen. H. L. Gilchrist, who is now Chief of the Chemical Warfare Service of the United States Army, Washington, D. C. He has been kind enough to consent to come here and tell us some of the effects, some of the things that we may expect, from these cases which have inhaled gases.

The Effects of Chemical Cases

By MAJOR GENERAL H. L. GILCHRIST, *Chief of Chemical Warfare Service, United States Army*

While the subject assigned me is not entirely clear, I believe that you wish me to discuss the late or aftereffects of the so-called cases of chemical injury. I feel that we have considerable information at the present time to base a prognosis on the final outcome of this type of injury.

At the close of the great World War, you will remember, there was a very definite impression that the soldier who had been injured (gassed) by chemicals was very likely to remain a cripple for life. Incidentally, I might say that during those early days after we entered the great strife, when I was privileged to see thousands of gassed, it was also my own impression. I can say advisedly that at the time the war ended we thought we might have a great number of permanent casualties, life-long cripples, from this new implement of warfare. Now, after 12 years of observation, we are qualified really to determine the extent of these injuries. All of the nations that participated in the World War have faced this same problem and boards of medical officers in all participating countries have reported on the end results in chemical cases, and it is interesting to know that all of these reports have been fairly uniform in the opinion that our early fears as to the permanency of injury were exaggerated.

As you know, the use of chemicals in war came without warning and was contrary to existing rules of warfare, so naturally their use gained considerable publicity. The subject was not only given much space in the columns of the daily press, but was written up extensively in magazines and periodicals. Unfortunately, most of these articles were notoriously wrong, and, as a result of these misleading statements, the true action of chemicals and gases on the human being, together with their residuals, was greatly exaggerated.

To what extent gas was responsible for many of the symptoms of which so many ex-soldiers complained following the war presented a serious problem to our Government. There was no doubt that many of these soldiers were exposed to gas sometime during their service abroad and that in a few cases their infirmities were traceable more or less to it, but the actual part that gas played in producing them was an unknown factor.

This lack of definite information was realized at the very beginning by the medical division of the Chemical Warfare Service and, as a result, early steps were taken to try to fathom it. In carrying on this important investigation every known means were resorted to in an endeavor to obtain information. Extensive correspondence was had with the officials of different chemical companies, with physicians and others who had actual experience with gas casualties, and through the State Department, with the different countries participating in the war to obtain their views on the subject.

In addition, a comprehensive system of research was carried on at the medical research laboratories at Edgewood Arsenal. This research began December 1, 1921, and continued for nearly five years, during which time not only many of the personnel at the laboratories were subjected to experimental gas, but in addition hundreds of animals were used, the object being to determine the true action of the different gases, whether any pathological lesions were actually produced, and if so the nature of such lesions. In carrying on the experiments with animals, they were gassed with minimum lethal doses and under conditions as nearly like those found in war as possible.

As a result of this extensive work much valuable information has been obtained. In a great majority of cases it was found that the action of the gases on the animals was similar to that on the human being. Many were sick for periods varying from a few days to a month, and they were only considered as recovered when their temperature, pulse, blood pressure, etc., were normal and no resulting symptom such as coughing and depression remained. The animals were then confined in large areas where they could exercise under normal conditions, and at varying intervals after recovery they were killed and their bodies carefully studied in order to ascertain if any pathological lesions remained as a result of the gassing.

Time prevents going into details regarding comprehensive study, but with your permission, I shall mention a few interesting results. For example, in the study of phosgene, which was a very important war gas, nearly 100 animals were used in this test alone. This study extended over several years and during the course of the work 61 of the animals were killed at intervals varying from 2 weeks to 15 months after recovery, the remainder being killed at later periods. Of the entire number, 70 showed no abnormal conditions; the rest showed evidence of slight changes in the lungs and other parts of the body.

In studying the effects of mustard gas, which as you know was also a very important war gas, 58 animals were used in the series. Of this number, 40 were killed at intervals varying from actual time of recovery to eight months thereafter, while 18 were killed at later intervals, and of the entire number studied 46 showed no changes. The others showed such slight lesions as congestion of the lungs, hemorrhages, etc.

In studying the effects of chlorine but 21 animals were used and of this number only 4 showed any changes whatsoever and these were so slight as to be negligible.

In the study of chlorpicrin, 48 animals were experimented with. Eight of these died in the kennels; 40 were killed at intervals ranging from 1 to 26 weeks after recovery. The post mortem of these animals showed no gross lesions of importance. A few showed evidence of congestion and of minor conditions in the lungs.

As a result of these extensive experiments, the following conclusions were reached:

1. In the great majority of animals gassed at lethal concentrations, in those that survived few changes could be demonstrated from two months to a year after recovery.
2. In the minority of instances lung damage was shown, but this damage was not widespread and was confined to small areas in the form of small patches of organization, thickening of the bronchial walls, certain loss of elasticity of the lungs, and occasional closing of the bronchioles. As might be expected, some scar tissue was also found but not severe enough to affect the efficiency of the lungs.

A further study of this subject was made by a board of officers appointed by the President in 1926. This board consisted of Dr. Allen K. Krause, of Johns Hopkins University; Dr. Phillip B. Matz, of the Veterans' Bureau, and the speaker. The object of the board was to investigate the residual effects of gases on patients who at

that late date claimed to be suffering from injuries caused by chemical agents while in the service. The board held its first meeting in February, 1926, and in order to conduct a thorough investigation, it was realized that the main problems confronting it were as follows:

1. To establish whether any or all of the several gases used during the late war left residua, either anatomical or functional, after a period of approximately six years.

2. If such residua be proved to exist, to determine their nature and relative importance.

The investigation from the outset resolved itself into an inquiry along several lines, as follows:

1. A determination of the pathological effects of the various gases.

2. An investigation of the world-wide scope of the impressions formed by military men, sanitarians, internists, and others as to the late effects of warfare gases.

3. An analysis of the present disposition of those men who had war records of having been gassed in the service.

4. A specific and exhaustive analysis of the entire medical histories, including all sick and wounded cards together with diagnosis tags, of a fair cross section of men disabled by the various gases from the date of gassing through all the various contacts with the Veterans' Bureau since then and up to the present time.

With the reservation that the final findings might require considerable modification of the present opinion, the board was impressed with the following probabilities:

1. That at this late period there are patients who exhibit definite residua, either anatomical or clinical, that are due to either one or a combination of gases.

2. That not infrequently there has been a complicating respiratory infection which, as is well known, might potentially lead to the same effects as gas.

3. That the most common organic residua as a result of gassing are pulmonary.

4. That active pulmonary tuberculosis is not a prominent residuum of the effects of the action of any of the gases.

We heard a great deal during the World War of the thousands of men permanently blinded by chemical agents. As a matter of fact, there were only 783 individuals in our Army of 4,000,000 that were carded for blindness in one or both eyes during the World War. Of these, 23 or 3.7 per cent were due to chemical agents. It is hardly possible for our returns to be incorrect on such a serious condition as this.

It is believed that possibly an investigation recently conducted by the Chemical Warfare Service will be of great interest to this group. Following the terrible catastrophe at the Cleveland Clinic Hospital, May 15, 1929, I made an immediate visit to that city and offered the municipality the facilities of the Chemical Warfare Service for investigating the nature of the disaster. The city of Cleveland accepted the offer. However, it urged that we make our report as promptly as possible; in fact, the coroner requested a report within 14 days. Our investigation of this disaster consisted not only in reviewing all the literature available on explosions of this kind, but the construction to scale of a model of the entire clinic building with

a set-off of a proportional amount of the same film substance that caused the Cleveland disaster. The investigation also included exhaustive studies as to the ignition points of various nitro-cellulose compounds; the heat required to set off especially nitro-cellulose film stored under various conditions; and finally and possibly most important, an exact study of the gases produced by the decomposition of nitro cellulose, especially the flameless decomposition (the so-called fuming off) of the film. The investigation also concerned itself with the proper methods to store film. The report was submitted on time and it is believed represents a real contribution to the safety of great numbers, as the recommendations for the storage of film and similar nitro-cellulose products are receiving international approval.

The Chemical Warfare Service hopes to be of further value in tending to reduce the number of casualties from chemical agents as an incident of our great chemical industry. The medical research division at Edgewood Arsenal is at the present time engaged in the preparation of a first-aid kit and a small manual for the first-aid treatment of persons injured by chemical warfare agents as well as certain other chemicals. The medical division of my office, as well as the medical research division at Edgewood Arsenal, receives a number of communications from physicians in industrial positions throughout the country making inquiry as to the proper method of treating chemical casualties. We are at all times glad to give all the information available; we hope that this practice has been of value and assure you that we will be glad to continue and extend this service.

The board of officers appointed by the President in 1926 was in session for over three years and through the State Department was in constant touch with leading medical men all over the world who claimed the disabled men were suffering from residuals. We studied their effects, not only in the Veterans' Bureau but through the Adjutant General, from the time the men were gassed, or claimed they were gassed, to the present time.

In order to present this a little better, I am going to use the screen.

[Slide.] This picture, taken in 1915 by the Canadians, shows the first gas attack which took place on the western front. It was on Vimy Ridge on that evil day in 1915, about 4 o'clock in the afternoon.

The statement has been made that Germany anticipated and prepared to use gas at the beginning of the war. That is an error. Germany never thought of using gas until after the war had been in progress several months and she discovered that her well-organized mechanical weapon of war was accomplishing no results, one reason being the dug-in method of warfare.

It was in the fall of 1914 that the German general staff called in the chemical scientists of Germany and placed the matter before them and, after carefully considering the entire proposition, it was decided to use chlorine, for the reason that Germany had a tremendous amount of chlorine and receptacles for conveying that chlorine to the front.

The Germans were prepared to use chlorine gas as early as February, but for one reason or another, mostly climatic conditions or the wind, it was put off from time to time until finally, in April, the gas attack took place; but by that time the Germans had lost all interest and, in fact, the use of chemicals in war had been considerably ridiculed and joked about. When the attack took place it left a gap over five miles wide in the front line. Had Germany realized the strength of her weapon, she could have passed and marched to the sea without a solitary shot, and the chances are the war would have been closed at that time. But as it happened, she was not able to follow up that great weapon.

[Slide.] These chemicals have been divided according to different classifications. First is the physical state. We speak of gases or chemicals and we think they are all gases. You will observe that some are liquids, some are solids, and some are true gases. Here are the tactical uses. The next is the part that interests us, the physiological effects.

All chemicals, all gases, have certain effects on the body. They affect the lungs and are known as lung irritants, or they are suffocants. The two principal gases are chlorine and phosgene, which are sternutatives, and produce sneezing; next are lacrymators. These are used to-day practically by all the different police departments. They accomplish the same purpose for dispersing mobs as machine guns, but the advantage of it is that the gases leave no widows or orphans. Then there are the vesicants. Then there are direct poisons of the nervous system, and we have hydrocyanic gas. It is practically worthless in the open air, but if confined in a room, we all know the effects. I imagine carbon monoxide has been discussed. It is not a war gas because of its instability.

Another important factor is persistency. We find certain chemicals will remain in a territory for a long time and others will not. The advantage of mustard gas is that it can be laid down in a territory and it will produce casualties for two or three weeks following.

I remember during the war going to see the casualties of 15 batteries of field artillery. These batteries bivouacked one night in a wood bombed two weeks before with mustard gas, and over 60 per cent of the personnel of the 15 batteries became casualties.

[Slide.] This slide concerns lung irritants, and the majority of the gases we find in our industries or in war—it makes no difference—affect the lungs. How do they affect the lungs?

Here are four little pictures—in our laboratory we have tried the following experiment several times. It has been repeated by the Germans and by the French. We have taken four cats of equal weight and gassed them with phosgene. Here is one cat immediately afterward. You see the normal lungs, weight 7 grams. Two hours afterwards see the increase. See the weight increase, five hours afterward, from 7 grams to 23 grams, and 9 hours afterwards, from 7 grams to 34 grams. What is the cause of that? The lungs fill up. It is a marked edema, and it shows the necessity of keeping the person absolutely quiet, because there is no intake of oxygen.

[Slide.] This was a picture taken on the western front, 11 hours after the man was gassed. He was gassed with phosgene, a lung

irritant. You gentlemen probably find examples to-day in your chemical establishments or establishments where they use chlorine or phosgene or any of the lung irritants.

There is the picture. If the man were in front of us here, we should see him striving to bring in his auxiliary muscles, trying to get a little air into his lungs. His face is red and his lips are blue, and if we took his temperature, it might be 100 or 101, pulse not over 100 to 101 or 102. That case will get well with normal treatment—bleed the man and take out 25 cubic centimeters of blood, open up the wrist or anywhere, and the chances are the man will get well by keeping him absolutely quiet.

[Slide.] Here is another man gassed, perhaps, at the same time—an entirely different picture. The cause? Perhaps this man was a weakling. The chances are that he didn't have the vitality—that he had been up in front and had a lack of sleep, a lack of nourishment; and there is the picture—an entirely different picture. That man would require entirely different treatment. He may be in a bed beside the other fellow with the red, mottled face; he may look over at the other and sympathize with him and wonder why he is in the hospital. He hasn't an ache or a pain, but he is there; his pupils are widely dilated, respiration 25 or 30—it may be 60 or 70—temperature 97 or 94, or 104, but his pulse you could scarcely count, perhaps 150 to 175. There is a man who will die; that class of case. He was a weakling at the beginning.

[Slide.] You can not arrive at the aftereffects unless you know something of the immediate effects. We had many cases of gangrene. The gassing starts thrombi in the lungs. We had a few, not many, cases of gangrene of the lower limb from thrombi. Mind, these cases are extreme cases, not the average.

[Slide.] This shows a section of the lungs of that man. That section was taken 11 hours after the man was gassed. You see the alveoli completely filled with liquid and they have broken loose. The bronchus is filled with the liquid, but the wall of the bronchus remains intact. Keep that in mind when we take up the picture of the man gassed with mustard.

[Slide.] Now we will take up mustard. It was one of the best war weapons. I might say it is one of the best war weapons we have to-day. We have found that a great many are very susceptible to it; it might be likened to poison ivy. It was a policy at the school at Edgewood Arsenal to make the sensitive test with all students.

At the present time we have several hundred records. The men expose their arms. Here are two sets of arms—two individuals. A drop of about 1 to 50 of mustard is put on the arm. The upper arm is extremely sensitive to mustard. The lower arm presents no sensibility. What does that mean? It means that if there is another war, in addition to giving the different vaccines, we will have the sensitive tests; that is, if gases are used, the men sensitive to mustard should not be permitted to go near the front area.

[Slide.] Here is a typical case of mustardization—looks very much like a man who had been on the seashore. It was taken eight days after exposure. It is a typical sunburn, with marked derma-

themia. His eyes are involved and in his throat there is a violent inflammation. It looks very much like a diphtheritic throat. It may go on and clear up or go into what is known as dark pigmentation.

[Slide.] This is a typical case. The vessels are greatly dilated and often the lids are swollen so you can scarcely see the eye, depending on the degree of mustardization. I have seen a tremendous amount of this. In the early days the eyesight would be lost; but we lost few cases of eyesight, as I will show you later.

[Slide.] Here is the pigmentation. This picture was taken after three weeks. Hundreds of men thought they would have black skin, very much like the skin of a negro, but fortunately it would clear up in two to three weeks.

[Slide.] This was taken nine hours after a severe mustardization. If it were colored properly, you could see there are pus areas. The mucous membrane is greatly thickened and could be stripped off. That is a markedly severe case.

[Slide.] This is from mustard—it is the foot of a student officer. Walking around in the classes taking a sniff test to get the odor, he accidentally came in contact with a little blade of grass where there had been a drop or two of mustard. He was wearing calfskin shoes and it penetrated the leather. He was a casualty five weeks after exposure.

[Slide.] This is the lung of the mustard case. You will observe that the air cells remain present. Mustard does not affect the lungs, so this is a gas entirely different from the lung irritant, which has a direct effect on the lungs. In a mustard case a man may be badly blistered and burned over the body, but his lungs and respiratory tract, barring the upper respiratory tract, are free. This is a very severe case; the lining of the bronchus has been completely destroyed.

As a rule in the Army the great problem is transportation, getting the men back, and the man gassed with mustard is made to walk because the man suffering from a lung irritant must be conveyed in recumbent position as every movement interferes with his intake of oxygen.

[Slide.] Here are the main features of the lung irritants and the mustard cases, entirely different. The vesicant has delayed effect. There could be thrown into this room a concentration of mustard vapor that would put us all out of commission, but we would carry on for the next three or four hours and the chances are none of us would know anything about it. We might detect a faint odor; but now there are ways of covering up the odor. That is another trouble with the mustard gas, the delayed symptoms, while the lung symptoms are immediate. If a little phosgene or chlorine were put into the room, we would detect it immediately.

[Slide.] Here is a table showing the war cases fully worked out from the records of the Adjutant General of the Army, backed up by the record from the Surgeon General's report of the number of men. Gas was responsible for 27.3 per cent of all the casualties. Of those casualties from gas 50 per cent were able to walk. In industrial life that is not so important, because there is plenty of

transportation; but in the Army transportation is a great problem, and anyone able to walk was compelled to do so because of that fact. So 50 per cent, expressed graphically, were able to walk; 10 per cent were lying cases—the chances are they were chlorine or phosgene cases—sitting cases, 35 per cent, as shown here; and mixed cases 5 per cent.

[Slide.] Here we have the number of days lost. We have weapons for the purpose of putting men out of commission. It is not good policy to have a weapon that kills a man. We do not want to kill on the other side for the reason that a dead man requires no attention. His remains can be buried either under flag of truce or at the cessation of hostilities, but the wounded man requires four or five able people to care for him from the time he is hurt until he gets well or dies, so we want a weapon that will wound but not kill.

Unknown gases—nobody knows the kind of gas—accounted for 33,587 cases. The number of deaths was 546, and the days lost 1,252,974 or an average of 37.3 days. The average for chlorine was 60 days—when a man was gassed, he was an invalid for 60 days, requiring four or five able-bodied persons to take care of him from the time he was gassed until he died or returned to duty; mustard, 46 days; phosgene, 45.5 days; arsine, 18.5 days. The average for the total was 41.6 days.

CHART 1.—TOTAL GAS CASES DURING WAR, GASES RESPONSIBLE THEREFOR, NUMBER OF DEATHS, AND TOTAL AND AVERAGE DAYS LOST

GAS	NUMBER OF CASUALTIES	NUMBER OF DEATHS	NUMBER OF DAYS LOST	AVERAGE EACH CASE
UNKNOWN	33,587	546	1,252,974	37.3
CHLORINE	1,843	7	100,473	60,
MUSTARD	27,711	599	271,993	46.
PHOSGENE	6,834	66	311,040	45.5
ARSINE	577	3	10,719	18.5
TOTAL	70,552	1221	2,937,199	41.6

[Slide.] This shows a series of 3,014 cases taken from the records in the Veterans' Bureau. Died from traumatism in the service (not from gas; they were either gassed and killed later on by other methods than gas), 1.4 per cent; died from disease in service, 1.4

per cent; made no claim for compensation, 44.2 per cent; compensation disallowed, 20.5 per cent.

CHART 2.—AFTEREFFECTS OF GAS POISONING—STATUS ON AUGUST 1, 1924, OF 3,014 "UNSELECTED" CASES FROM RECORDS OF VETERANS' BUREAU

DISPOSITION OF CASES	CHLORINE 27.8%	PHOSGENE 53.2%	MUSTARD 33.7%	MIXED GASES 5.3%	TOTAL	PER CENT
DIED FROM TRAUMATISM-IN SERVICE	13	15	14	2	44	1.4
DIED FROM DISEASE IN SERVICE	6	11	26	.1	44	1.4
MADE NO CLAIM FOR COMPENSATION	360	446	467	60	1333	44.2
COMPENSATION DISALLOWED	179	212	194	34	619	20.5
CLAIMS PENDING	3	4	6	0	13	.4
COMPENSATION DISCONTINUED	86	112	117	24	339	11.4
NOW DRAWING COMPENSATION	191	200	192	39	622	20.7
TOTALS	838	1000	1016	160	3014	

OF THE 44 DEATHS FROM DISEASE 28 OR 63.6% WERE ATTRIBUTAL
TO THE IMMEDIATE EFFECTS OF THE GAS.

[Slide.] Here is an interesting chart relative to blindness. Do gases produce blindness? From the records we have there were 812 men in the war who lost their sight, one or both eyes, from gas and other weapons. Of that number 4 per cent was due to gas, and the majority, 96 per cent, was due to weapons other than gas. I am saying this to contradict the many statements as to gas or chemicals producing blindness. Only 33 cases,¹ or 4 per cent of the 812 cases in our Army, were due to gas in one form or another.

CHART 3.—NUMBER AND PER CENT OF CASES OF BLINDNESS DUE TO GAS AND NONGAS WEAPONS IN WORLD WAR

NATURE-INJURY.	CAUSE	NO.	PER CENT	PERCENTAGES EXPRESSED GRAPHICALLY										
				10	20	30	40	50	60	70	80	90		
LOSS OF RIGHT EYE	GAS	16	1.9%											
	NON-GAS	307	37.8%	[Bar chart showing 37.8%]										
LOSS OF LEFT EYE	GAS	10	1.2%											
	NON-GAS	289	35.6%	[Bar chart showing 35.6%]										
LOSS OF BOTH EYES	GAS	4	.5%											
	NON-GAS	44	5.3%	[Bar chart showing 5.3%]										
LOSS OF ONE EYE- UNKNOWN	GAS	3	.4%											
	NON-GAS	59	7.3%	[Bar chart showing 7.3%]										
TRAUMATISM	GAS	0	0											
	NON-GAS	80	10.	[Bar chart showing 10%]										
TOTAL	GAS	33	4.	[Bar chart showing 4%]										
	NON-GAS	779	96.	[Bar chart showing 96%]										

[Slide.] This chart shows the number of casualties. Thirteen and three-tenths per cent died on the battlefield and of these less than 200 were due to gas. The others were removed to hospitals. This shows the number of hospitalized men suffering from gas, 70,552, and of those only 1,221 died; that gives us 1,421, or one-half of 1 per cent of all the casualties in the war, due to gas.

¹ Included in this number are 10 cases resulting indirectly from war weapons.

The yellow shows the hospitalized casualties not due to gas, and the weapons responsible. We had only 235 due to bayonets in our entire Army. Here are the casualties due to falling bodies, grenades, saber wounds (only 12), shrapnel, etc. There were 12,470 deaths.

[Slide.] Perhaps some of you were where this picture was taken. Over 3,000 gassed men were brought in in one night. This is one section of them. They are all suffering from mustard gas, but we know that a very small percentage—less than 2 per cent—of those men will die. If they had been wounded by weapons other than gas, 24 per cent would have died. I am bringing these out to show that the effects of chemicals are not nearly so bad as the effects of wounds of another nature.

[Slide.] Here is a picture, which I will try to express graphically. It is a comparison of deaths from gas with the deaths from weapons other than gas. This is the British experience. They had 180,981 gassed men, and of that number 6,062 died. That is the exact number of the men who died from gas in the British Army.

[Slide.] This shows the casualties of the German Army. They had more deaths from weapons other than gas for the reason that Germany was short of man power and was obliged to put men back in the front long before we did, and so their deaths were heavier than ours, but the comparison is quite the same.

[Slide.] Now let us check up our own. We had 70,752 gassed, and of those 1,421, or practically 2 per cent, died. Here we have 187,586 casualties from weapons other than gas, and of that number 24 per cent died. The ratio was practically the same as with the English, which means that the man wounded with a chemical or gas in the field has twelve times the chances for getting well that the men wounded with other weapons have. I do not see why that same percentage would not hold good in our industrial enterprises.

[Slide.] Here are the effects—the permanently crippled, living to-day—if they have not died in the meantime—with the loss of one or more limbs. We find a total of 9,972 men in a permanent crippled condition as a result of the war. Of that number, gas was responsible for only 33.

As to the relation of tuberculosis, that has been very interesting, and we have made a 10-year study of the effects as to tuberculosis, of gassing of the lungs, or of gassing in general. In France the rate per thousand for tuberculosis among soldiers gassed was 2.45, and for all soldiers serving in France in 1918 the rate was 3.50, showing that the chances were better for those who were gassed.

[Slide.] Now, a word about how we conduct our research. Nearly all of it is done at Edgewood Arsenal, and we take the different gases after they are finished in the chemical laboratory. They are sent to the Medical Research Division and tried out on animals. That is an ordinary flow meter in which an elevation is possible. The first area we have is the center where it is strong, and then we have a second and still a third area.

[Slide.] That shows three with the animals in the cages, and we have that elevation of about 15 feet to get the elevation of the gas clouds and see what the concentration of the gas is at that height; and we have found that most gases after 15 feet are practically nil, so that explodes the idea of gassing cities. Such a thing is ridicu-

lous, for the reason that concentration strikes the ground and seldom reaches an altitude of 15 feet.

[Slide.] This shows one where the gases are present, and we note carefully and get readings from the flow meter. The animals are placed in the hospital and are given as careful treatment as human beings, for the reason that it is to our advantage and interest to get true records.

[Slide.] Now, this is not a body of Ku Klux Klanners. We try our research work not only on animals but also on human beings. There is a class of over 200 men who volunteered. We had a very large class at the school, and many officers of the general staff went through the experiment. The object is to find out what is going to be done with the airplane in dropping gas from different altitudes. They are dressed in white, and they put on masks and march into the gas clouds following gases distributed by airplanes. There is other work that is secret about which I can not tell, but this shows what is being done. We are doing everything possible to find out what the effect of gases will be on the individual. We realize what the airplane means, the rapid strides made in aviation to-day, and we are using it in our research. I might say that the United States never intends to use gas; but if the other fellow does, we want to be prepared to reciprocate.

[Slide.] I have been asked to say something about the Cleveland clinic disaster. This terrible disaster occurred a little over a year ago, as a result of which a little over 125 lives were snuffed out. I was ordered there, as soon as it happened, to make an investigation. If there was a gas killing over a hundred people, the service decided we should know about it; so I reported to the county prosecutor of Cuyahoga County the following morning, and I was interested in the Cleveland clinic disaster until the investigation closed.

This is a plan of the basement of the Cleveland clinic. I believe if we were going to construct a building for the purpose of killing people, we could have made no better arrangement. This was the basement. That part of the basement not excavated was 131 feet long by 75 feet wide, connected with this room where the films were kept, which room was 18 by 24 feet, and about 10 feet high. It contained 4,500 cubic feet. Connecting with that room was a tunnel which circled clear around the building and up through the middle of the building and connected with an elevator. Here was the shaft through which came a draft to give plenty of ventilation, so it took that poison gas clear around the building and up through the shaft of the elevator.

[Slide.] When I reported to the Cleveland municipality, I extended the privileges of the Chemical Warfare Service; the offer was immediately accepted, and at one time we had 110 people working on this thing at Edgewood. I returned to Edgewood and we built a model, you might say, of the Cleveland clinic disaster. We knew there were 9,000 pounds of films in that room and that it contained 4,500 cubic feet, and we used that ratio in all of our experiments. We built our little chambers representing three rooms, each containing 8 cubic feet, and we used 16 pounds of films in all our experiments.



FIGURE 1.—Acetate films, eight layers inclosed in envelope, with two layers of paper between successive films. 100-watt frosted lamp was placed on negative films as shown. Temperatures were obtained by means of a thermocouple connected to a potentiometer indicator, the hot junction of the couple placed as nearly as possible at point of highest temperature of films



FIGURE 2.—Stack of 20 full-size cellulose nitrate film negatives in envelopes; lamp without wire guard; films ignited after exposure of 7 minutes at indicated temperature of 163° C.

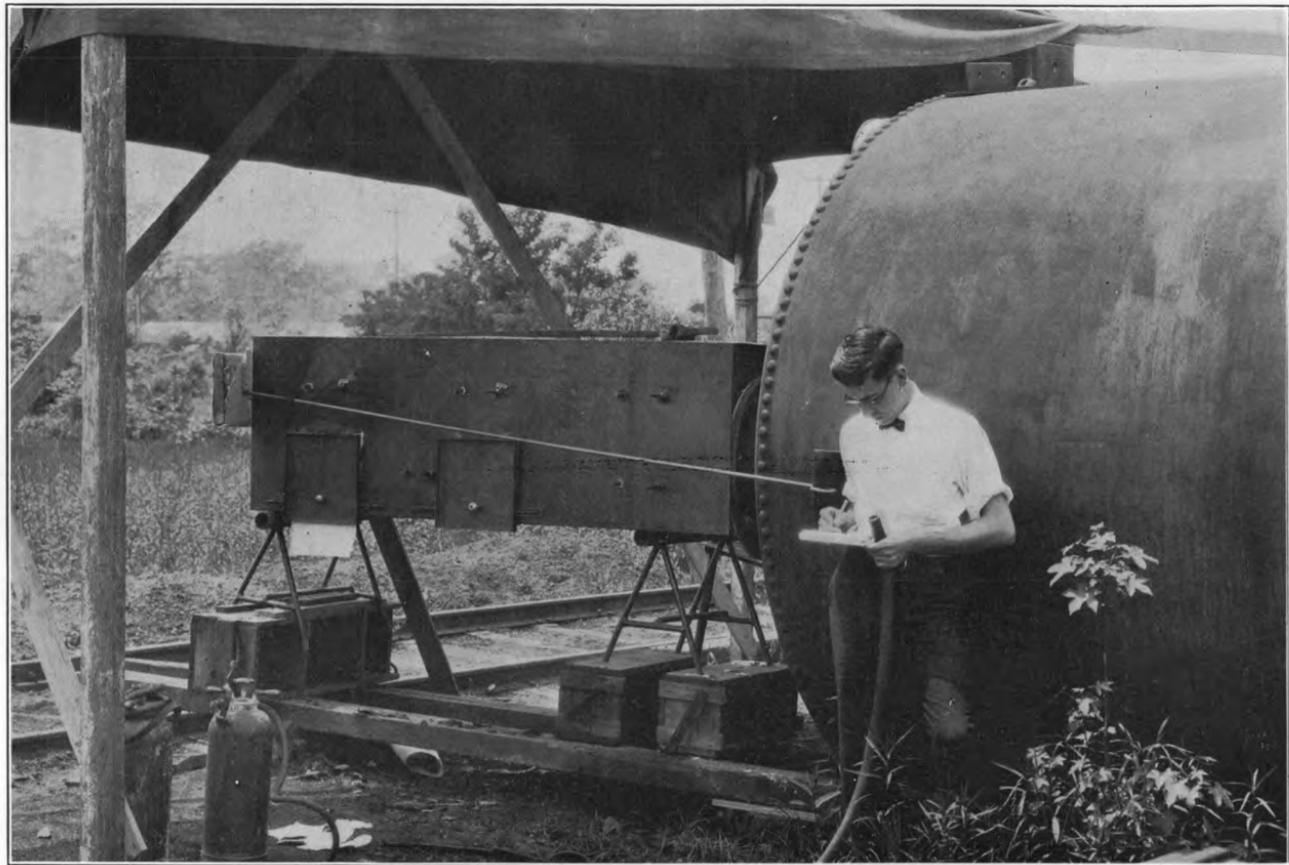


FIGURE 3.—Sheet-metal chamber (2 feet square), hooked up to 910 cubic-foot tank used in investigating products of combustion of cellulose nitrate X-ray film negatives

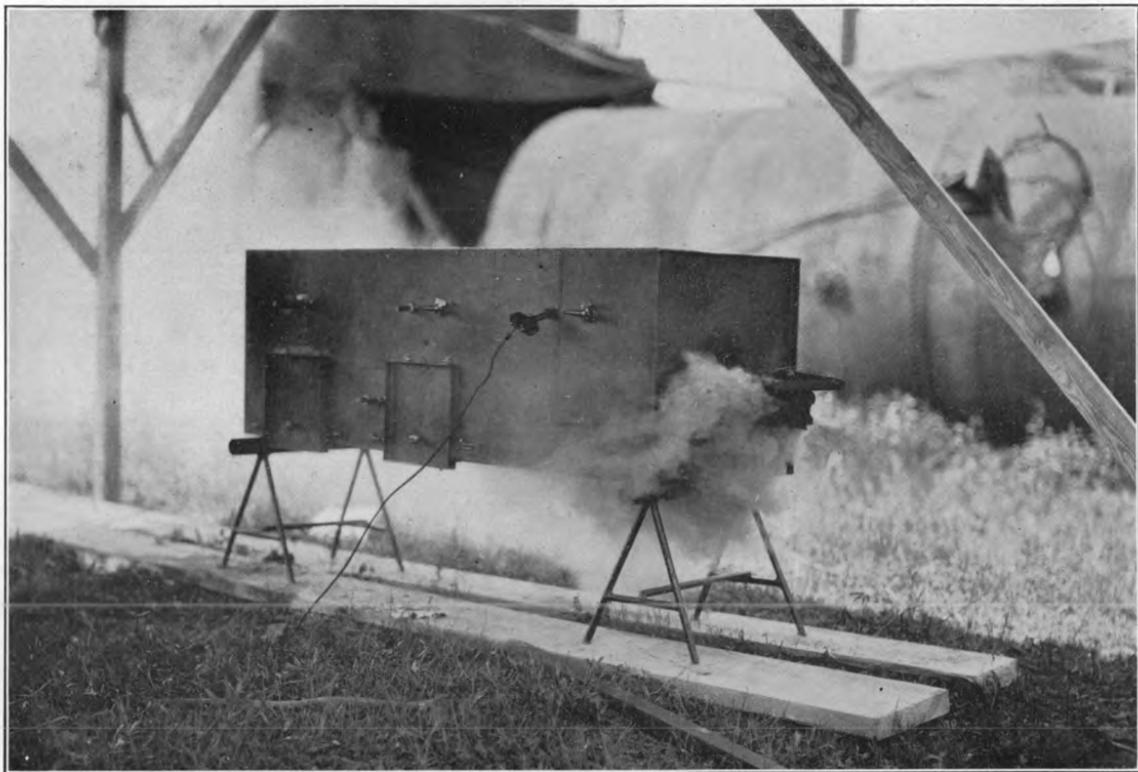


FIGURE 4.—Sheet-metal chamber (2 feet square) showing fumes from negative cellulose nitrate X-ray film while burning

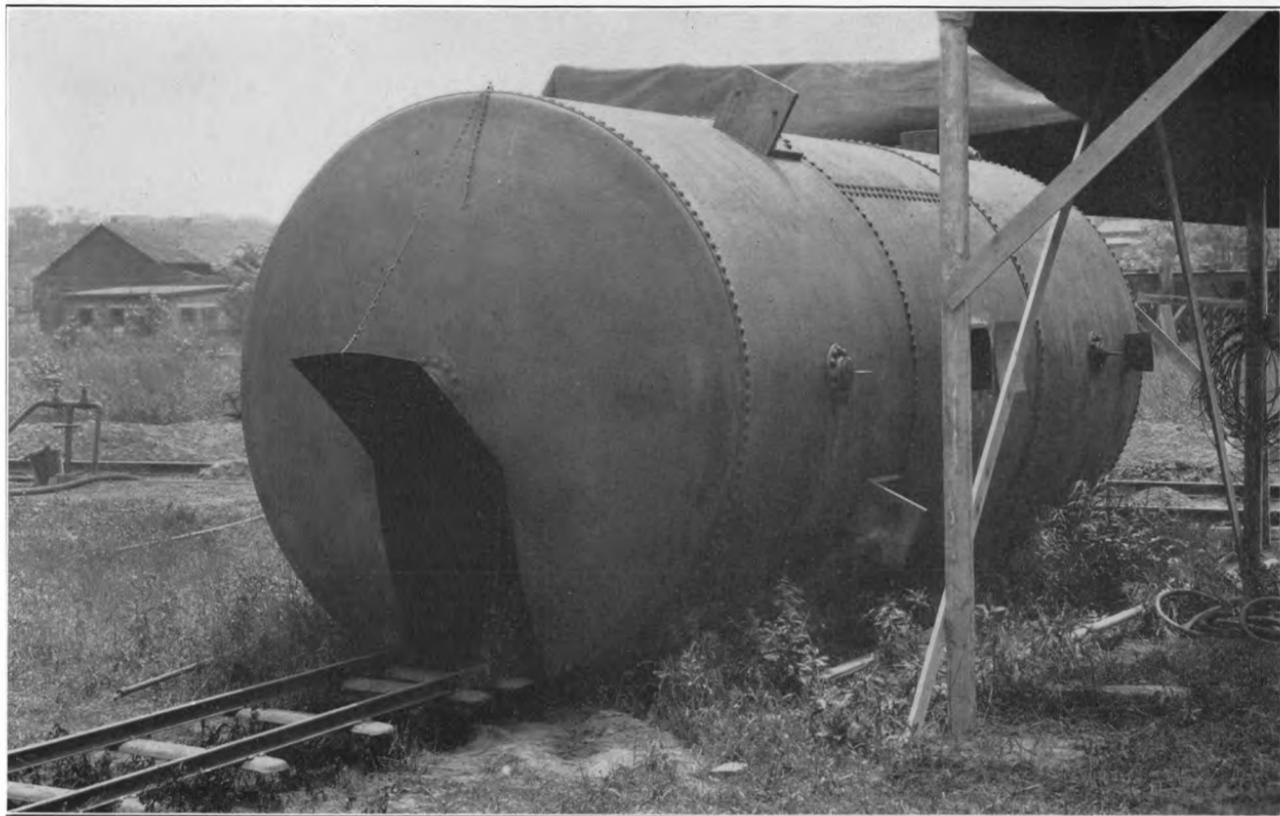


FIGURE 5.—910 cubic-foot tank used in investigating products of combustion of cellulose nitrate X-ray film negatives, showing track leading into tank for carrying into tank chemical and other testing apparatus



FIGURE 6.—Fumes and flame from cellulose nitrate X-ray negatives issuing from experimental steel tank

The Eastman Kodak people gave us over two tons to carry out this work and there were two classes of films—the acetate and the nitrate. Unfortunately, the films in the Cleveland disaster were the nitrate form. This is one of our experiments. It is questionable as to what caused it. Some claim it was due to a hot bulb. They were using 100-watt lamps. The lamp was resting on the films. They were acetate films—one of the new films. That lamp rested on that film for 1 hour and 17 minutes without any effect. We have been unable in our test to start a conflagration or combustion with acetate film.

[Slide.] This shows the nitrate film. There is the result after 5 minutes and 10 seconds. It varied from 5 minutes and 10 seconds up to about 7 minutes. We went through that 18 or 20 times. We found the jacket acted as a sort of protector and it took 2 or 3 minutes for the film to start if in the jacket, but the 100-watt lamp coming in contact with the nitrate film, if it was outside of the jacket, would start a conflagration in between 5 and 6 minutes. Inside the jacket it takes 2 minutes longer and, as I stated before, with the acetate or fireproof film we were unable to start a conflagration with the 100-watt lamp. I speak of that because that was the lamp that was used at the time.

The statement was made that the conflagration of the films started from the hot steam pipes. We went through several experiments and found that anything that would give a temperature of over 100° C. in a room containing nitrate films was dangerous, spontaneous combustion starting. We allowed some of those films to rest against a steam pipe, say 135 pounds pressure and a temperature of about 160°, and in 3 to 4 minutes a conflagration would start. We tried it with the asbestos lying over the steam pipes and it was impossible to start a conflagration.

This little thing here represents the basement of the clinic. It contains three rooms, each 2 feet square, and in all our experiments we used 16 pounds of film—representing the proportion of volume to weight—and went through that disaster exactly as described in the papers. What happened? The conflagration was started with a match or cigarette. We dropped it in through a little tube and at the end of a minute we see this.

[Slide.] See the heavy brown smoke, and then there would be a rest for a minute and a half, following which was an explosion, which was followed by flame. That was our experience, and it tallies exactly with the accounts of that Cleveland clinic disaster. That disaster could have happened in thousands of places in the United States. In Washington we found the same class of films stored in nearly every hospital in the city. In the large Veterans' Bureau there was a tremendous quantity of the same film, but fortune was with the other organizations.

[Slide.] We took this tank and chiseled this door here, made out of $\frac{3}{8}$ -inch steel, and we used it as a trap through which we could put the animals.

After the smoke and flame there would be enough heavy, brown smoke from the 16 pounds of film to make a heavy cloud which proportionally would engulf any large apartment house in the city of Washington. We also had vacuum gas tubes which we collected

and sent to the laboratories. We took the temperature. In view of the fact that the building was five stories high, we used towers to correspond with the five stories of that building, stationing the animals in the towers, to see the effect of the elevation of the gas going up.

[Slide.] We have taken that little basement and fastened it into a tank and started a conflagration, and have gone through that Cleveland Clinic disaster experiment many times and it has all checked up the same.

[Slide.] That shows the heavy, brown smoke which is followed by flame.

As a result of that Cleveland Clinic disaster we found something new. It was the opinion that most of the deaths of the animals and the early deaths in the Cleveland Clinic disaster were due to carbon monoxide. We found something new. We found that in many of those animals their blood was absolutely free from carbon monoxide, but death was due to lack of oxygen; and the secondary deaths—the deaths of those which died a week or several weeks following—were due to marked edema of the lungs from NO , NO_2 , or N_2O_4 .

In closing I want to call your attention to the fact that the Chemical Warfare Service is your service and we are prepared at any time to carry on any work for you. There is scarcely a week in which we do not get into communication with some medical man or some plant where they want an investigation into the matter of peculiar gas deaths that are taking place, and we are glad to do it. I want to extend that invitation to you. If any question comes up as to any peculiar gases, just refer it to the Chemical Warfare Service, because it is your service and we are only too glad to do it for you.

DISCUSSION

Chairman GEHRMANN. This paper has given us a clear conception of what we may expect from individuals who have met with similar conditions in industry. We will have a general discussion on this subject now.

Mr. MAGUIRE (Pennsylvania). I should like to ask whether Major General Gilchrist's department has made any investigation of the gases used in refrigerating mechanisms.

Major General GILCHRIST. We found that there was considerable controversy between the natural-ice people and the artificial-ice people. We conducted some experiments, and it is our belief that from the average refrigerating plant there is no trouble at all, in spite of all the different gases and chemicals. Of course, in a large establishment where you have one central generating plant, if that leaks and it all goes to one refrigerator, there might be trouble, but in our experience we found they were absolutely safe.

There is one thing I failed to bring out and that is the importance of having fire escapes on concrete or fireproof buildings. On the Cleveland Clinic there were no fire escapes. The chances are that had there been, many lives might have been saved. Gas was never figured on, and as a result, the entire dependence was on the stairs, but the first explosion threw down walls and blocked the door and tore up the stairs and it was impossible for the people on the upper

floors to use the stairways. You should have fire escapes where there is likely to be an explosion or combustion at any time.

Doctor PEDLEY (Montreal). In connection with the use of carbon tetrachloride fire extinguishers, have you had experience with phosgene generation?

Major General GILCHRIST. We found if we put it on a hot automobile we would have phosgene generation, but if we poured it on the burning flames it had no effect. The little extinguisher in the automobiles, however, if used on a hot surface would generate a heavy phosgene gas.

Mr. KEARNS (Ohio). I want to ask a question. Referring back to the refrigerants used in the electric refrigerating plants, if the pipe should be broken or ruptured in any way in a unit using sulphur dioxide, and the entire amount of refrigerant, which is about four to six pounds, should escape into a room where a person was sleeping, would it prove fatal?

Major General GILCHRIST. Do you mean in a central plant?

Mr. KEARNS. I had in mind one unit.

Major General GILCHRIST. Absolutely no.

Mr. KEARNS. But it might occur where a multiple system was involved, if it discharged through one unit?

Major General GILCHRIST. If you have a central plant and throw the entire discharge into one room, yes; but with the individual refrigerator we have found no trouble at all. It is absolutely safe.

[A rising vote of thanks was tendered Major General Gilchrist.]

Chairman GEHRMANN. The next subject is one which is of very great importance to those of us who are concerned in industry. It is the object of our company, of course, to employ always as many men as possible. In our physical examinations it is our aim to make a selection of suitable employees for various types of work, and one of the conditions with which we are faced, and faced very frequently, is the applicant who has heart disease. The question arises, at what work can we safely put such a man.

I know of no one better to give an insight into this matter than Dr. Olin S. Allen, of Wilmington, who has been specializing along this line for many years. He has studied many heart cases, and he has been of very great assistance to us in the past in helping us to determine just what is the proper thing for us to do for these cases. I take pleasure in introducing Doctor Allen.

The Classification of Heart Disease from the Standpoint of Employment

By OLIN S. ALLEN, M. D., of *Wilmington, Del.*

To classify heart disease according to the type of work that is suitable in each case is a very difficult problem. It is not only difficult for the physician to know the type of work suitable for each case, but it is difficult for the employer to find positions that are compatible with the capacity of the patient's heart. I would like to say here that my experience with the employers in Wilmington has been most gratifying. They have, in practically every instance,

done more than their share in helping to restore the employee's health. In some instances they have actually made positions to suit the patient's condition. This I think is a high tribute to any company, that it takes the employee's health into consideration first and the finances of the company second.

For the purpose of this paper I will classify heart disease into six main groups. These groups may be subdivided into two or more subdivisions. I do this because each subdivision may warrant a different kind of work. The six main groups are as follows: 1. Hypertensive heart disease. 2. Rheumatic heart disease. 3. Coronary disease and angina pectoris. 4. Arteriosclerotic heart disease. 5. Syphilitic heart disease. 6. Thyroid heart disease.

I shall further divide the group of patients suffering from hypertensive heart disease into two classes, namely: Hypertension *with* coronary involvement, and hypertension *without* coronary involvement.

The first group, those having hypertension with coronary involvement, especially when they have a high diastolic blood pressure, are rarely ever able to do more than light work, such as ordinary clerical work in an office, watchman's job, doorkeeper, timekeeper, and so forth. Laborious work is out of the question, because a large number of these patients complain more of general weakness and lack of reserve than they do of actual heart symptoms. This is probably due to two factors: 1. A large percentage of these cases have advanced general arteriosclerosis as well as a marked sclerosis of the aorta and coronaries; 2. Their cerebral and peripheral circulatory efficiency is very much lessened.

In the second group of hypertensives are those having a systolic hypertension (a normal diastolic blood pressure) without coronary involvement. These patients are usually able to do any ordinary work without much difficulty, and frequently they are able to carry on for a number of years before cardiac decompensation sets in.

The next classification, the second main group on the list, is the rheumatic group. This comprises all of the different diseases that seem to cause rheumatic heart disease, namely: Rheumatic fever, tonsillitis, quinsy, St. Vitus dance, and scarlet fever. This group is subdivided into three stages, each patient passing through each stage sometime during his heart trouble if it is allowed to go untreated. The three stages are: (1) Inflammatory; (2) valvular; and (3) muscular.

The inflammatory stage is really the beginning of rheumatic heart disease or an endocarditis. By this term I mean an inflammation of the endocardium or the lining membrane of the heart. This is often coincident with the rheumatic attack or may not develop for weeks afterwards. This inflammatory stage usually occurs in early childhood, most frequently between the fifth and fifteenth year, although not uncommonly between the fifteenth and twenty-fifth year. I believe it is comparatively rare after the twenty-fifth year. It is more frequent in the females than the males. It is a much more prevalent condition than is commonly supposed. It is a very difficult disease for physicians to diagnose accurately. Oftentimes it is equally difficult to make the patient realize that he has a mild attack of endocarditis because the symptoms are apparently so unimportant. The patient may go along for a considerable time noticing nothing except a slight

temperature, especially in the evening, and the heart rate a little faster than usual and the most important symptom is that of fatigue and lack of reserve. Practically all that the physician finds upon examination is a temperature of from 99 to 100, a systolic murmur at the base or apex of the heart, or both, and a tachycardia from 100 to 120. During this stage it is very easy to confuse this condition with incipient tuberculosis, because, in many ways, they resemble each other. I do not believe that these patients should work in the active stage of this disease, especially when they run a temperature of 100 or over. If we hope to prevent later heart complications it is only in this early stage that the possibilities exist of arresting the disease so that the valvular and muscular stages will not occur. If the physicians and employers will cooperate in this matter I believe we can do much to ward off some of the serious complications that are all too often occurring later in life. I do not believe that this group should return to work until their temperature is normal and the heart rate is below 90 for at least two months and then they should only do light work, such as clerical work, for the next year.

The second stage of rheumatic heart disease is the valvular stage. By this I mean organic disease of the valves themselves, especially of the mitral valves. A condition in which you have little warty vegetations form on the valves and the valves are not able to close properly, thus causing a back flow of blood with each heart cycle. This is not a serious complication from the standpoint of work, providing the patient has a normal heart muscle demonstrated by a normal electro cardiogram, no regurgitation at the aortic valve, and a normal or elevated blood pressure. In other words, the organic disease of the mitral valve alone does not necessarily mean a serious cardiac handicap for these patients. They are oftentimes able to carry on heavy work for a number of years, even up to 75 or 80 years of age. In one case I saw recently, a patient 79 years old, with organic mitral valve damage or mitral stenosis, gave a history of having had an attack of rheumatic fever at the age of 26 years, or 53 years previously. He had done very heavy work all of his life. His ability to do this was due probably to three factors. First, he was 26 years of age when he contracted rheumatic fever, at which age his resistance against rheumatic fever is much more pronounced than when younger. Secondly, he had no organic disease of the aortic valve, nor auricular fibrillation, and no heart-muscle damage. Last, but not least, he had a moderately high systolic blood pressure of 190 and the high blood pressure undoubtedly was very beneficial to his valvular disease.

Another group of patients that we meet in the valvular stage of rheumatic heart disease are those who have not only organic mitral valve damage but a complicating aortic valve damage as well (aortic regurgitation) and auricular fibrillation. This group of patients should not be allowed to do any more than ordinary clerical work or any light work along this line. Many of them are able, even with these serious complications, to do work of this nature for a number of years, provided they are willing to get 10 to 12 hours' rest at night and not to take too much exercise outside of their working hours. I have several patients of this latter stage who have been going along successfully for a considerable time doing clerical work and they really seem in much better condition now than they did a

few years ago, the main feature here being not so much the hours they put in at work as what they do with the hours they are not employed.

In the third class of patients of the rheumatic group is the group having disease of the heart muscle, or the manifestation of such disease, namely auricular fibrillation. By auricular fibrillation we mean a complete disassociation of the action between the two upper and two lower chambers of the heart, or the auricles and ventricles. Whenever a patient develops auricular fibrillation it always means that he has a serious damage to his heart muscle, but it does not mean it is serious from a prognostic point of view or from a work standpoint, because I have seen any number of these cases of auricular fibrillation able to do light work for some time. Especially is this true of what we call a slow fibrillator. In the case of a fast fibrillator the effort tolerance is not nearly so good and the reserve strength is low, likewise the prognosis is guarded, but even so they are able to carry on sometimes for several years.

The next group of patients is the coronary and angina group. The coronaries are subdivided into the acute coronary thrombosis and chronic coronary sclerosis.

In acute coronary thrombosis the patient is often seized with sudden pain over the heart itself or epigastric region, or the pain may even be in the abdomen. This pain is usually more or less severe and as a rule it lasts from one-half hour to several days, depending to a great extent on the size of the thrombus. If the thrombus is small and plugs up one of the smaller arteries the pain may even be very slight. There may or may not be shortness of breath with coronary thrombosis, although there is a group of patients who have no pain but have a severe grade of dyspnea and choking sensation associated with the attack. These attacks are often called acute indigestion. It is not uncommon to pick up a newspaper and read that Mr. So and So was at a dinner the previous evening and was taken seriously ill and died in a few minutes of acute indigestion. In reality this is usually acute coronary thrombosis. It is true one might have an attack of acute indigestion but never serious enough to prove fatal. After a patient has had an acute coronary accident he should remain in bed at least 10 weeks, for our greatest hope of prolonging the lives of these unfortunate patients lies in the long-continued rest. Clinical experience has taught us that prolonged periods of rest are most important factors in the establishment of collateral circulation around the coronary block.

I shall describe an attack of acute coronary thrombosis that came under my observation some four or five months ago. This patient was walking along the street and was seized with a pain in the pit of the stomach. It hit him so hard that he had to sit down on the steps of a house for a half hour, at the end of which time the pain subsided. He got up and started to walk home. About the end of half a block the pain returned, together with a choking sensation. This pain did not radiate down either arm. He sat down again and rested until the pain disappeared and remained sitting until some one happened to come along who knew him and took him home. He then went to bed and in the course of a few hours the pain had entirely disappeared. He remained in bed for a few days and then returned to work again. He noticed that he could not walk

over a half a block before the pain and discomfort appeared in the epigastric region. Sometimes he would have to stop twice in one block and other times he would be able to walk several blocks before the pain would attack him again. I examined him a few days after the initial attack and found that he had had a thrombosis of one of the smaller coronary arteries. He was put to bed for 10 weeks, at the end of which time he was allowed to be up 1 hour three times a day and this was increased each day until he was finally up 10 hours a day. I reexamined this patient just a few days ago and found the coronary T wave, which was present on the cardiogram, had disappeared. At this examination the cardiogram was normal. His X-ray plate demonstrated that his heart was actually about 2 centimeters smaller than on the previous examination. The patient has now returned to work and so far he has had no return of the pain or dyspnea for several weeks.

The other form of coronary disease is usually called chronic coronary sclerosis, or a gradual narrowing of the lumen of the vessel. It sometimes takes months or even years for this to take place. It is remarkable how some of these patients with angina and chronic coronary disease are able to carry on ordinary office routine and often direct successful business for a number of years before the final break. This seems to occur in the type of patient who is willing to adjust his life to the capacity of his heart, and after all heart work depends to a great extent on the heart capacity. Basing all normal hearts on 100 per cent capacity, a patient having a 50 per cent heart capacity, providing he is willing to live within this capacity, is often able to go along quite well for a long time. On the other hand, if you have a patient who has a 50 or 60 per cent capacity and he tries to do 90 or 100 per cent work daily, sooner or later he is going to use up his heart reserve and go into definite heart failure. I should like to add here that the heart is probably one of the quickest organs of the body to recuperate and it is often surprising how quickly the heart comes back. No doubt we all abuse our hearts, and especially in our younger days, I think, oftentimes by trying to outdo the other fellow. This is not entirely confined to our boyhood days, for I believe it is all too frequently done between the fortieth and fiftieth years by the male sex, a man trying to prove to his friends, in some physical sport, that he is just as good as he was 20 years ago.

The fourth group of cases is the arteriosclerotic group. This class of patients is probably one of the easiest to handle and often the best results are obtained. These patients go along quite well doing fairly heavy work, sometimes for a number of years, so much so that the ordinary light work does not seem to embarrass their cardio vascular system to any great extent. Again, if they go into heart failure a few day's rest in bed often restores compensation and they are able to carry on ordinary work for many months.

As to syphilitic heart disease, in this type of patients, if well advanced such as aortic insufficiency, they are rarely ever able to do heavy work, but if they have no leaky valve at the aortic ring but have muscular degeneration instead, these patients are oftentimes able to do light work for quite some time. It must be remembered, however, that all patients that have syphilis do not have syphilitic heart disease, for you may have syphilitic disease in other organs of the body and at the same time the heart may not be affected. If not

affected to any great extent, this type of patient can usually do any ordinary work as far as his heart is concerned.

The sixth and last group of heart diseases is the thyroid group. This can be divided into two main groups, the toxic group and the nontoxic group. We can dispose of the toxic group readily because I believe that, with but very few exceptions, these patients should be operated upon for the removal of the thyroid gland, for it is a well-known fact at the present time that the greatest possibility for a complete cure is in surgery. After the patient is operated upon and there have been no serious complications, he is usually able to return to his regular work in the course of about two months—in some cases much earlier, while in others it may be a little longer.

The nontoxic group, or the medical case, usually occurs in adolescence or the third decade. It is more prevalent in females than in males. This type usually responds to medical treatment and as a rule is able to do any kind of work as far as the heart is concerned. It is not a handicap from an employment standpoint.

There is still another group of cases that have been toxic at one time and during this toxic state did severe cardiovascular damage, and then, in course of time, burnt out as it were. These patients' reserve strength is so low and their efforts limited to such an extent, that they are rarely ever able to fill a position satisfactorily, and, therefore, these patients should never be employed.

Conclusions:

1. Many of these patients who come to us complaining of heart symptoms do not have true heart trouble.

2. A complete history is the first thing to be done when a patient comes to a physician complaining of cardiac symptoms.

3. Granting that the patient gives a history of cardiac pathology, then the problem is to decide, after a complete physical examination, whether the patient's symptoms are caused by true intracardiac pathology or whether the heart is simply acting as a signal for pathology somewhere else in the body.

4. The most common causes of heart symptoms, outside of the heart itself, are abscessed teeth, tonsillitis, sinuses, gall bladder, appendicitis, gastrointestinal tract, and central nervous system.

5. Should the patient prove to have true cardiac pathology, then our problem is to determine the type of the disease and the stage in which it is at the time of the examination.

6. After the type of disease and the strength of the heart muscle is determined, then the character of the work which the patient is allowed to do should be of such nature that it would be well within the safety zone of his heart's capacity.

DISCUSSION

Chairman GEHRMANN. The discussion will be opened by Dr. C. H. Watson, medical director of the American Telephone & Telegraph Co., New York City. He has under his supervision probably more employees than any other man in the country and has had a lot of experience along this line.

Doctor WATSON. We in industry have grown up with the pre-employment examination and we find ourselves from time to time elim-

inating some of the academic factors which we in our younger years included in what constituted rejection for employment and what did not. In our organization we find ourselves becoming more and more liberal in respect to heart disease. I can recall the time when a simple heart murmur—what we call a mitral murmur, a diseased condition between the smaller and larger chambers of the heart—would constitute a rejection.

Now the members of the American Heart Association feel that murmurs centering around those particular valves of the heart are no longer necessarily hazards against employment; in fact, we feel that valvular heart disease plays a very small part as a cause for rejection or for specialized employment.

I have an old gardener working for me up in the country who has a heart that has no characteristic valve sounds in it whatsoever. He is a man 67 years of age and does the hardest kind of labor. Two years ago I took care of him through a double lobar pneumonia. My care was largely directed by telephone between New York and the country, and he made an uneventful recovery. Notwithstanding his added years and the kind of work he does (the kind I can not do myself without great discomfort), he has a heart which, if he were approaching a preemployment examiner, would probably cause him to be turned down on the ordinary academic grounds.

Through the efforts of the American Heart Association we find that the industries throughout the country are becoming more and more educated along the lines of what constitutes an "employable" heart. We find that men with almost all kinds of hearts can be employed, and that very few people have heart disease who can not be fitted into some kind of opportunity to earn a living.

There is a social element involved in the heart question, because if we stop and think of a cardiac or a potential cardiac in terms of the unit of our population, we are bound to think of him as having acquired that through no fault whatever of his own, and I think that feature runs through the whole gamut of cardiac pathology. While he can damage the heart as a result of overexercise or overwork, part of the responsibility for his lesion is because he does not know any better. We can not penalize members of society for anatomical damage sustained by various parts of their bodies as a result of contact either with the things they use in their efforts to earn a living, or the things they do as a result of competition or overeffort in getting about.

In the preemployment examination we have a practical element which has to be met in industry. The average medical man whom we engage to carry on our preemployment examinations must of necessity not be a heart specialist. He can not be expected to discriminate between some of the finer elements of the cardiac diagnosis; neither is it possible as a routine measure to make use of some of the refinements of cardiac examination in the form of the electrocardiogram or some of the balances which have to do with cardiac function. The average man we take on as an examiner in the Bell system we are sure is a doctor and in good standing, one who can hear reasonably well and in a measure knows what he hears. I think our examiners in the Bell system are about as good as the medical examiners you find in any of the industries, yet I know perfectly

well, because we have gone over cases some of our men have seen, that they can not always tell the difference between diastolic and systolic murmurs, and that is not passing any discredit on the diagnostic ability of our medical men, but as a practical thing industry can not afford to pay men to do preemployment examinations in the expert sense and with the skill implied in a real heart examination.

On the other hand, we have felt that there should be certain rules laid down for the instruction and guidance of our men that would help them a little in determining what cardiac cases should be kept away from the job. The rules are relatively simple, and some of them are not quite right. We are perfecting them a little year by year; in the course of time I think we will have fewer rules and the ones we have will be more concise. In other words, when an individual who comes up for preemployment examination shows a cardiac condition and at the same time has areas of focal infection, such as diseased tonsils or diseased teeth, or if he has cardiac disease and signs of active syphilis, we tell him that he must have the conditions corrected.

The active syphilis case with active cardiac signs does not necessarily have active syphilis throughout the rest of his days and at the same time show active heart disease. In the syphilitic with heart signs, in the secondary stage of the disease, the cardiac signs can be made to clear up very considerably.

Another one of our rules that we insist on is the one regarding what is known as diastolic murmur. We do not believe that, for labor requiring any great degree of physical strain or even moderate strain, we can accept an individual who has a diastolic murmur or diastolic thrill. We mean by that the transmission of cardiac vibrations to the hand as it is laid over the heart. A diastolic murmur or thrill with us precludes employment. On the other hand, people of that sort are referred to their physicians for prolonged treatment and observation before we say we can not give them work.

There is one other very strict rule which we adhere to, and that is in regard to the individual with a heart that over a period of time runs very rapidly and stops, and runs very rapidly and stops. If we can get the opinion of a cardiologist and he confirms what we fear by an electrocardiogram, we will not employ those people.

Our doctrine with reference to the employment of the cardiac individual is to put him to the same tests we put all as regards physical requirements. In other words, in our industry we feel that everyone should have an opportunity of earning a living, provided the job is there, who in the execution of the task is not a menace to himself, to others, or to property or service. That is the old hackneyed phrase which the conference board of physicians in industry formulated a good many years ago, but in running through the gamut of our preemployment problems and fitting into this the cardiac picture, I think that is about as fair a statement as anyone can make about it.

If in the preemployment examination of the individual with heart signs—signs of heart disease, no matter what they are—any of the evidences of breakdown of the mechanics of the heart are present, we do not consider the man employable, because we consider him a menace to himself or to others. Such people, however, are all po-

tentially employable if suitable measures can be carried out for their medical supervision.

As to my statement with reference to the professional skill of the medical examiners in industry, I do not mean that industry should plan to correct the schedule now in progress. Taking the average medical men scattered throughout a community, they can not be cardiac specialists any more than they can be gastroenterologists or specialists on any of the organs of special sense. When we choose medical men, as we must, to do our preemployment examining, we have to take average men; and in laying down the rules as to whom we will take and why we will accept men for employment, we must adapt the rules to the skill of these particular people.

If our industries can finally come to the point where they will be willing to have a consultant available, one whose regular fee they will be willing to pay, we will have reached a place where the man of average medical ability can play his part and his efforts will be supplemented to the degree conformable with the best thought along higher medical lines.

I feel very strongly about the employment of the cardiac individual. There are very few people with heart disease for whom some sort of job can not be found.

This is strictly in confidence between you and me: In the American Telephone and Telegraph medical department we seldom reject for heart disease. Such a rejection is exceedingly rare. Once in a while the picture is a little different in some of the associated companies, but that is because of the necessary absent treatment which we at headquarters are obliged to give the associate companies. We can not always see that they do everything in the medical line in the way we should like to have them, and every once in a while we find people being rejected for employment who have nothing more nor less than a simple systolic murmur heard over the apex of the heart—in other words, a mitral murmur. There is nothing that disturbs me more over the future of medicine as applied to industry than to see that sort of thing taking place, because the doctor in industry has a very definite part to play in upholding the hands of the members of the compensation boards and in making possible the perfection of the human machines that operate and manufacture our products and render our services. The surest way for the medical man to ruin that very important social endeavor is rejection for employment on grounds that are questionable, not only as respects cardiac disease, but as respects other forms of organic pathology.

Mr. DUXBURY (Minnesota). I do not know whether the speaker was really serious in his reference to what he seemed to think was the attitude of this association with reference to preemployment examination. I do not think he was really serious, but I think we ought not to have that impression prevail, because it seems to me this association ought not to use its influence against anything so important as that is for the employee himself. In so many instances it results in the determination of something that treatment will relieve, and in many other instances in placement of the employee where he can properly perform useful work. For many other reasons it would be very unfortunate to have the impression prevail,

it seems to me, that this association deprecates the practice of pre-employment examination.

Chairman GEHRMANN. During the past few years we have heard a great deal about the effects of spray painting, what the hazards might be, and so on. We have with us this afternoon our friend, Dr. Henry Field Smyth, of the University of Pennsylvania, who is probably better qualified than anyone I know of to tell you something of the effects of spray painting. His subject is, What Are the Health Hazards of the Spray-Coating Industry?

What Are the Health Hazards of the Spray-Coating Industry?

By HENRY FIELD SMYTH, M. D., DR. P. H., *assistant professor of industrial hygiene, University of Pennsylvania*

"From the mechanical and production standpoints the introduction of the spray gun or air brush has proved a most important advance in many branches of industry and its use is increasing rapidly. In many types of factories to-day it is the only means employed for placing permanent coatings for protective or artistic effect on manufactured articles. Its use not only saves time but economizes materials and permits of artistic effects not easily obtainable in any other way, and also produces better and more uniform coverage than can be had otherwise.¹

"Since its more general use, however, there have appeared from time to time accounts of apparently serious harm to workers from the inhalation of sprayed materials, as solid particles, droplets, or vapors. The attention of the medical profession was first called to the possible danger of spray painting by Doctor Albaugh in 1915,² and two years later Dr. Wade Wright included one spray painter in a list of cases of lead poisoning.³ In 1922, Dr. N. C. Sharpe⁴ reported the results of an investigation into the lead-poisoning risk among spray operators, his studies including air sampling in the laboratory and in factories and the testing of the efficiency of various types of respirators. He recognized the danger of poisoning from fume inhalation where volatile solvents are sprayed, but reported no tests for them.

"In 1924, Dr. Alice Hamilton⁵ called attention to the risk of lead poisoning from spraying lead finishes, and in 1924 and 1925 the Wisconsin Industrial Commission promulgated regulations governing the use of the spray gun.⁶ These were objected to by some as being too drastic and by others as inadequate.

¹ Except where otherwise noted, quotations are from Journal of Industrial Hygiene, Boston, June, 1928, pp. 163-214: Spray Painting Hazards, by H. F. Smyth and H. F. Smyth, jr.

² Ohio Public Health Journal, June, 1915, p. 512: A Fatal Case of Slow Poisoning in the Person of a Young Man Employed as a Sprayer in a Varnishing Department, by R. P. Albaugh.

³ Monthly Labor Review, May, 1917, p. 1257: An Industrial Clinic, by W. Wright.

⁴ Journal of Industrial Hygiene, Boston, April, 1922, p. 378: Report on an Investigation to Determine the Hazard to the Health of Operatives Using the Spraying Machine for Painting: The Risk of Lead Poisoning, by N. C. Sharpe.

⁵ Journal of the American Medical Association, Chicago, Aug. 23, 1924, p. 583: The Prevalence and Distribution of Industrial Lead Poisoning, by Alice Hamilton.

⁶ Wisconsin Industrial Commission. General Orders on Spray Painting. Madison, Apr. 10, 1924; rev. October, 1925.

"The Pennsylvania Department of Labor and Industry, desiring to draft regulations governing spray coating, decided first to endeavor to obtain more definite data than were then available as to the possible health hazards, particularly as to the risk of benzol poisoning from the spraying of lacquers. For this purpose it initiated a state-wide survey in 1925 of the entire spray-coating industry, it being thought best to include the use of varnishes, shellacs, stains, paints, and even vitreous enamels.

"This field study included plant tests for materials in the air where spraying was in progress, air measurements, and surveys of spray equipment and exhaust ventilation, and medical examinations of spray operatives. This was supplemented by a series of tests at a spray booth erected in the laboratories of the Mechanical Engineering Department of the University of Pennsylvania, the booth being donated for this purpose by one of the prominent firms manufacturing spray-painting equipment. The Pennsylvania findings have been published in a special bulletin.⁷

"Following the Pennsylvania survey, the National Safety Council, through a special committee representing as far as possible all phases of the industry and all directly interested groups, instituted a supplementary study. This was aimed to include work not covered in Pennsylvania or not sufficiently covered owing to lack of opportunity."⁸

Both of these studies were conducted by the author and his associates, and both have been reported upon in considerable detail.⁸

Following these studies, Myers, in 1928,⁹ reported at some length a study of the benzol hazard in spray painting in automobile refinishing shops in New York City. Spray painting and health hazards were discussed in the Bulletin Sanitaire of Montreal early in 1928,¹⁰ and in 1929 Banik, in the Zentralblatt für Gewerbehygiene¹¹ considered the dangers of lacquer work. Siebert¹² discusses the possible injurious effects of a number of hydrocarbons and halogen derivatives used in lacquers in Europe, such as tetrachlorethane, trichlorethane, carbon tetrachloride, chloracetone (developed in the lacquer when acetone and chlorine derivatives are used together), monochlorbenzene and benzene. Kranenberg and Peeters¹³ report benzene poisoning in a group of men spray painting airplanes.

Based on the experimental work reported in this country and on clinical evidences of harmful effects, at least two more of our States, California and Pennsylvania, have drafted safety orders or regulations governing spray coating.¹⁴

⁷ Pennsylvania. Department of Labor and Industry. Special Bulletin No. 16. Harrisburg, 1926.

⁸ In Pennsylvania Department of Labor and Industry Special Bulletin No. 16, Harrisburg, 1926; and National Safety Council committee on spray coating, final report, September, 1927.

⁹ Journal of Industrial Hygiene, Boston, October, 1928, p. 305: Medical and Industrial Findings Among Spray Painters and Others in the Automobile Refinishing Trade in Manhattan, by J. Myers.

¹⁰ Bulletin Sanitaire, Montreal, 28, 1928, p. 113: Spray Painting and Health Hazards.

¹¹ Zentralblatt für Gewerbehygiene, June, 1929, p. 1927: Dangers of Lacquer Work, by Banik.

¹² Journal of Industrial Hygiene, Boston, September, 1929, p. 202: Injury to Health Caused by Lacquer Solvents, by G. Siebert. (Abstracted from Zeitschrift für Angewandte Chemie, Berlin, 1929, vol. 42, p. 17.)

¹³ Journal of Industrial Hygiene, October, 1929, p. 235: Chronic Benzol Poisoning, by R. H. Kranenberg and H. Peeters. (Abstracted from Zentralblatt für Gewerbehygiene, December, 1928, p. 358.)

¹⁴ California, Department of Industrial Relations: Tentative Spray Coating Safety Orders, 1927; and Pennsylvania, Department of Labor and Industry: Regulations for Spray Coating (Tentative Draft), 1928.

It is not the purpose of this paper to discuss in detail the scientific findings of the above investigations, or even the clinical manifestations of injury among sprayers, but rather to consider wherein may lie the health hazards incident to the use of the spray gun, and to indicate how these may best be minimized or removed.

Whatever harm there may be comes not from the act of spraying but from the use of toxic or otherwise injurious materials in sprays, or from the conditions under which spraying may be done.

Among toxic materials so used may be listed both volatile and nonvolatile substances. Formerly benzol was the chief offender in the volatile class, but as a result of the investigations and report referred to above this substance has been largely eliminated from the better grade of American lacquers, though still used to some extent in some cheaper grades of lacquers and thinners.

"The findings of the two American surveys¹⁴ show that benzol can not be sprayed even in low percentages without its accumulating in the air and affecting the health of the sprayer, unless he is protected in some way. It was found that most exhaust ventilation installations in use were inadequate to afford this protection, either because they were poorly designed, not kept clear, or not adjusted as intended by the designer, or else they were not supplied with enough air. It has also been noted that many of these installations could be made efficient, some without change of design and some by changing duct size and design. Some new installations were found working admirably and giving a considerable margin of safety for lacquer or other spraying.

"Whether plotted according to degree of blood change or to length of time spent as sprayers, the National Safety Council survey records show the same type of curves as those obtained in Pennsylvania excepting that, owing to the greater intensity of exposure, the preliminary stimulation is not so evident and the development of disturbed blood pictures is more rapid and more intense.

"In the automobile industry in general, with its quantity production and continuous line spraying, operatives are using the gun and are enveloped in spray from 80 to 90 per cent of their time. Therefore the exposure is greater for the same materials than was found in Pennsylvania.

"Even relatively small amounts of benzol in lacquers may give rise to benzol concentrations in the air breathed by the sprayer well above the danger limit of 100 parts per million for continuous exposure, as set by the benzol committee of the National Safety Council.¹⁵

"While adequate exhaust ventilation equivalent to air movement past the sprayer toward the spray gun of from 150 to 200 feet per minute will usually reduce such benzol concentrations to within the safe limit, yet safety for the sprayer is not assured by this alone."

Where for any reason materials containing benzol must be sprayed, it would be best to furnish the sprayer with an efficient air mask or helmet that assures him of an adequate supply of pure benzol-free air. There are several types of such devices on the market.

"In all cases sprayers of volatile substances should be offered the protection of periodic medical examinations.

¹⁴ California, Department of Industrial Relations: Tentative Spray Coating Safety Orders, 1927; and Pennsylvania, Department of Labor and Industry: Regulations for Spray Coating (Tentative Draft), 1928.

¹⁵ National Safety Council. Committee on Benzol. Final report, May, 1926.

"Protection against the benzol hazard is best afforded by discontinuing the use of any spraying materials containing more than the minimum amounts of benzol that may be present in the best commercial toluol (2° boiling range) and in denatured alcohol used in lacquer manufacture—not over 0.5 per cent in all."

Even with the elimination of benzol, it must be realized that almost all, if not all, of the volatile solvents used in lacquers may be toxic if in sufficiently high concentration. The Smyth laboratory tested on animals the toxicity of a number of the more commonly used solvents and placed them in three groups based on relative toxicity in the concentrations usually employed in lacquers; least toxic were ethyl acetate, amyl acetate, and butyl acetate; next were gasoline, turpentine, and xylol; and most toxic toluol and butyl alcohol.

"The entire investigation furnishes a strong argument for the insistence on exhaust ventilation wherever lacquers of any type are being sprayed. The materials listed and tested do not nearly exhaust the list of those used as lacquer materials, and the fact that practice in this respect is still frequently changing and new ingredients continually being introduced, about which there is available no information as to their effect on the health, is another argument for the protection of the sprayer in all cases. The removal of benzol from lacquers will undoubtedly remove the greatest single hazard of either acute or chronic poisoning in lacquer work but it does not warrant the discarding of precautionary measures."¹⁶

The less volatile turpentine used in paints (either gum spirits or steam distilled turpentine) may be an inhalation hazard if in sufficient concentration, or, for susceptible skins, a dermatitis hazard. Most of the more volatile solvents may also produce dermatitis if applied as liquids to susceptible skins, but in the ordinary spraying operations with any degree of exhaust ventilation droplets of these substances do not collect on the skin. However, the practice of cleansing the hands and arms at the end of the spraying job with the spray solvent has been responsible for cases of dermatitis when the solvent itself was not subsequently removed with soap and water.

The absence of visible spray coming from the booth where lacquer is being sprayed does not assure the absence of hazard to the sprayer.

The toxicity of volatile solvents used in spraying is measured in parts per million of toxic vapor in the air inhaled by the worker. Where benzol alone is being used or where there is a constant mixture of two or three known solvents, the concentration may be measured by an instrument of the interferometer type, such as has recently been made available by the benzol producers; but where kinds and relative proportions of solvents are subject to irregular variations, as in the usual commercial lacquer work, this will not answer. For this type of field work the method perfected by Henry F. Smyth, jr., for benzol¹⁷ will give dependable results.

Among nonvolatile toxic substances used in sprays the chief offender is undoubtedly lead. Legge¹⁸ has stated that 0.5 mg. of

¹⁶ Journal of Industrial Hygiene, Boston, August, 1928, p. 261: Inhalation Experiments with Certain Lacquer Solvents, by H. F. Smyth and H. F. Smyth, jr.

¹⁷ Journal of Industrial Hygiene, Boston, October, 1929, p. 338: The Determination of Small Amounts of Benzene in Air, by H. F. Smyth, jr.

¹⁸ Legge, T. M., and Goadby, K. W.: Lead Poisoning and Lead Absorption. New York, Longmans, Green & Co., 1912.

lead per cubic meter in inhaled air is the smallest amount capable of causing poisoning after long exposure, and this is usually taken as the limit of safety for continued exposure. The amount of lead in the air inhaled by the worker depends not alone on the percentage of lead in the material sprayed but also on the size of the droplets and direction of the spray. If there is no visible paint on the face or in the nostrils of the sprayer, little, if any, lead is being inhaled.

"The combined surveys previously referred to show that it is impossible to spray any materials containing appreciable amounts of lead without at times exceeding the safe limit of lead in inspired air for continuing exposure. With under 1 per cent of lead in the material being sprayed this limit should usually not be exceeded if reasonable care is exercised and reasonable exhaust ventilation provided. With amounts much in excess of 1 per cent, concentrations much above the safe limit will frequently be encountered, though not always. The many uncontrollable variables in commercial spraying make it impossible always to be sure of safety in this respect.

"While good exhaust ventilation will usually protect the sprayer, the only safe practice where materials with much over 1 per cent of lead are likely to be sprayed is to use an efficient respirator or air mask, as in the case of benzol spraying."

In the automobile and vitreous enamel industries were found a number of operatives being leaded through lack of these precautions.

"There are so many variable and uncontrollable conditions met with in the application of coating materials containing lead in any form that exhaust ventilation as at present generally practiced can not always be depended upon properly to protect the sprayer.

"Where adequate exhaust ventilation is not assured, sprayers of lead materials should wear protective hose masks or respirators," as with benzol.

"Adequate ventilation should provide for an air movement past the sprayer of from 150 to 200 feet per minute toward the exhaust duct.

"It would be safest to discontinue the spraying of any paints or lacquer coats containing over 1 per cent of benzol.

"All workers who spray materials containing lead should be given the protection of periodic medical examinations."

The surveys referred to brought out a previously overlooked hazard of pulmonary fibrosis or silicosis in the spraying of vitreous enamels onto metal parts "in spite of the fact that the silica content in the material sprayed does not average as much as 50 per cent. The silicosis hazard predominates where sheet metal is spray coated and the lead hazard where castings are coated," although at least one large manufacturer of spraying enamels has now on the market a leadless enamel for this work that should greatly reduce this hazard.¹⁹

"Air velocities well over 100 feet per minute reduce the dust cloud materially and those over 200 feet, as recommended by the National Safety Council committee, produce very satisfactory conditions.

"The recommendation of the National Safety Council that glazes be carefully balanced so as to contain no free silica will help conditions but may not remove the hazard, as these findings indicate

¹⁹The American Enameler, March, 1929: The Injurious Effect of Lead Enamel on the Health of Workmen, by H. F. Smyth.

that with a presumable preponderance of silicates these glazes are capable of producing fibrosis."

English authorities are recognizing increasingly the possibility of producing fibrosis with silicates, as in the special case of the so-called asbestosis reported on at length by Merewether.²⁰ Silicate fibrosis is of a somewhat different type than silicosis due to SiO_2 .

"If siliceous materials are sprayed without exhaust ventilation, the operators should always be protected by hose masks or respirators."

Having indicated the principal toxic hazards of spray coating, and having in a general way indicated the importance of exhaust ventilation to keep the concentration of harmful material in the air breathed by the worker below the danger limit, it might be well to consider in some detail how safe conditions are to be maintained under different circumstances.

Even fairly toxic materials may be sprayed under proper conditions, and it must be realized that the final judgment as to the adequacy of protection is based not on shape and size of spray booth or location and size of exhaust fans, or on rate of air movement, but on actual concentration of toxic material in the air inhaled by the worker, as determined by field tests, and on the personal susceptibility of the sprayer to the particular harmful agent to which he is exposed.

We can determine the safe concentration for the average worker, but it must always be borne in mind that susceptibility to poisonings varies greatly with the individuals, and the maintaining of reasonably safe conditions does not guarantee that no worker will be poisoned. Therefore, periodic medical examinations of all men continuously doing spray coating as full-time or even half-time work are highly desirable so that the especially susceptible worker may be transferred from the job before he has been seriously harmed.

The only safe alternatives are the complete elimination of toxic materials from sprays (advisable but not always feasible), or the use by exposed men of positive-pressure air masks or helmets. With these, somewhat more fresh uncontaminated air enters the mask than the worker needs, thus providing a continuous out leakage from the mask, and so preventing any contaminated air from the work place entering.

One more alternative, only possible with small material or flat surface spraying, is the use of completely automatic closed equipment so that no toxic spray escapes into the workroom.

The more I have been connected with this work, the more convinced I am that the answer to this, as to all problems where fairly toxic materials are handled in industry (and they often must be), is the periodic medical examination to determine the first signs of ill effect and then to watch the man and, if that continues, to remove him from his job.

For instance, among the workers, in benzol, one of the first indications we see is a shift in the blood picture, and then we know there is a shift toward danger. If it is only slight, we watch him

²⁰ *Journal of Industrial Hygiene*, May, 1930, p. 198, and June, p. 239: *The Occurrence of Pulmonary Fibrosis and Other Pulmonary Affections in Asbestos Workers*, by E. R. A. Merewether.

a little more—he may become acclimated—but if the second examination shows a further blood change, there is no use temporizing; sooner or later you will have to remove him from the job or else send him to the hospital or out of industry entirely.

DISCUSSION

Secretary STEWART. I was very glad that Doctor Smyth at least mentioned the matter of hose masks. The Bureau of Labor Statistics made an investigation of spray painting, not an academic nor a university one, but its agents went where men were spraying automobiles, spraying anything, just ordinary paint shops where they were using the spray gun, and that is where the lead poisoning is found. As regards benzol, I regret Doctor Smyth found it necessary to admit that it is necessary to use benzol. I do not believe that it is ever necessary to use benzol, and to my mind something ought to be done in such cases—just as the Du Pont Co. has done something. Because of its experiences with the stuff, it has stopped using it entirely as a paint thinner. Men will buy paint that is absolutely free from benzol, then open the can, and thin the paint with benzol. Three-fourths of them know nothing about the results of that sort of thing, and the other one-fourth don't care.

There is nothing that is causing such a percentage of increase in occupational disease as lead poisoning, and the spray gun is doing it. We can not abolish the spray gun and we do not want to, but why temporize with the thing? There is just one remedy, Doctor Smyth, and when you have seen as many bad plants as I have, I think you will agree with me that while a number have adequate air (I would make it much higher than you, even to 400 feet per minute), there are factories where air current is not going to solve the question. To my mind there is one answer to any spray painting and that is the hose mask.

Mr. KEARNS. During Major General Gilchrist's discussion of the Cleveland clinic, he remarked that perhaps fire escapes on the clinic building would have been the means of saving some of the lives of the people in the building. That may have left the impression with some of the representatives here that there were no emergency exits or stairways in the building. There were two stairways in that building, but, unfortunately, due to the extraordinary circumstances or conditions there, apparently both were cut off for a time at least, one by the flames and the front stairway by reason of the explosion that took place in the film room.

I didn't want anyone to get the wrong impression, that there were no emergency exits. I think the general thought was if there had been an outside fire escape, where people could have been taken directly to the outside air, immediately, that it might have been the means of saving some of these lives. I make this statement now with apologies. It should have been made when Major General Gilchrist was here so that he could have offered further explanation, but I want to correct what might have been a wrong impression regarding the provision of emergency exits.

[Meeting adjourned.]

FRIDAY, SEPTEMBER 26—MORNING SESSION

Chairman, W. O. Stack, president I. A. I. A. B. C.

BUSINESS MEETING

President STACK. The first report is that of the auditing committee.

[The auditing committee reported that the accounts of the treasurer had been carefully examined and were found to be correct as shown in the report submitted to the association. The committee recommended that \$1,000 of the amount remaining in the treasury be substantially invested and that the bond of the secretary-treasurer which expires October 23, 1930, be renewed, in the sum of \$10,000. The report was accepted, and the recommendation adopted.]

President STACK. The next report is that of the committee on resolutions.

REPORT OF COMMITTEE ON RESOLUTIONS

Whereas the Congress of the United States has created a commission to arrange a fitting nation-wide observance of the two hundredth anniversary of the birth of George Washington, in 1932; and

Whereas the high purpose of the event is to commemorate the life, character, and achievements of the most illustrious citizen of our Republic and to give every man, woman, and child living under the Stars and Stripes an opportunity to take part in the celebration, which will be outstanding in the world's history: Therefore be it

Resolved, That the International Association of Industrial Accident Boards and Commissions does hereby indorse the program of observance of the two hundredth anniversary of the birth of George Washington, to take place in 1932; accept with appreciation the invitation of the George Washington Bicentennial Commission, and pledge this organization to extend earnest cooperation to the United States commission in all possible ways, so that future generations of American citizens may be inspired to live according to the example and precepts of Washington's exalted life and character, and thus perpetuate the American Republic; and be it further

Resolved, That this resolution be incorporated in the official proceedings of this meeting and that a copy thereof be transmitted to the George Washington Bicentennial Commission, Washington, D. C. [Adopted.]

Resolved, That the secretary of this association be and he is hereby instructed to ascertain the best methods and the most convenient time for calling a convention on all-American workmen's compensation law administration, preferably in Rio de Janeiro, Brazil, in Mexico City, Mexico, in Washington, D. C., or in Toronto, Ontario. [Adopted.]

Resolved, further, That the thanks of this association be extended to the citizens of this convention city and State who have had part in providing for our welfare, instruction, and entertainment; to the numerous persons who have contributed valuable papers to the literature of our association; and especially to the illustrious president of the Industrial Accident Board of

Delaware, Dr. Walter O. Stack, and to his charming wife, who has been such a gracious hostess to our dear ladies, who have all had such a splendid time due to her great care and attention. [Adopted.]

President STACK. Is the special committee on president's report ready to report, Mr. Wilcox?

REPORT OF COMMITTEE ON PRESIDENT'S REPORT

The committee to which the association referred the president's address and the recommendations made by him report as follows:

That the suggested amendments to the constitution be not adopted.

That the proposal for the setting up of a standing committee of rehabilitation and a like committee on workmen's compensation legislation be adopted, such committees to be named as other standing committees of the association are named and that each said committee consist of five members.

That the committee on workmen's compensation legislation be charged with the duty of reporting to the next regular meeting of the association on the following matters:

1. A legislative plan for adoption by the States to secure the full and just protection of the rights of all parties where employees are injured in so-called extraterritorial service.

2. Recommendation of a uniform statutory provision to be by law construed as a part of every workmen's compensation insurance policy to protect employees against any miscarriage of benefit protection.

3. The proposal of a plan for a uniform statutory provision covering the subject of third-party liability.

The committee recommends against directing attendance upon the meetings of the National Safety Council, and further that the program committee give consideration to the question of whether the French system of measuring permanent disabilities should be considered by the association and, if so, to give it suitable place on the next convention program.

FRED M. WILCOX, *Chairman.*

F. M. WILLIAMS.

F. A. DUXBURY.

ETHELBERT STEWART.

O. F. MCSHANE.

HAL M. STANLEY.

F. W. ARMSTRONG.

[Report of committee on president's report adopted. The chairman of the committee then explained in detail some of the provisions of the report, and the following discussion on third-party liability occurred.]

DISCUSSION

Mr. PARKS (Massachusetts). Chairman Wilcox has called our attention to the difficulty of administering that part of the compensation law called third-party suits. I wanted to discuss that the other day when the paper was read; but there were so many papers, valuable papers, being read, that there was no time for discussion. I think one thing we gain by coming here is the exchange of views, and I have not heard any exchange of views on this question of third-party suit. I have followed up that third-party suit for the past 18 years. I was the one who put it into our act origi-

nally; later on we amended it, and then we found that this subrogation idea, where the employee subrogated his rights to the insurer and it was to sue the third party, and the employee was to receive four-fifths of the balance over and above what compensation was paid him if the suit was successful, came up, and we found that was somewhat of a myth to the employee because the insurance companies had a sort of reciprocity agreement. In one accident the insurer of a third party would be one company, and the insured covering compensation would be another company; and the insurer of the third party would say to the insurer covering compensation, "How much has it cost you to pay compensation?" Well, perhaps, the answer would be \$300. The insurer of the third party would say it would pay that and that would give it a common-law rating. That left the employee with the myth of a third-party suit.

He took no part in it. He had a substantial equity, but nothing to say about the settlement. So we introduced an amendment to our legislature. I introduced it myself, drafted the law, in which no settlement of a third-party suit—subrogation proceedings—could be brought about without the permission of the employee. The legislature in its wisdom thought that a little too radical and as the measure passed the legislature and was signed by the governor, it provided that no third-party settlement could be made—no subrogation proceedings—without the permission of the industrial accident board.

How do we do that? The third-party proceedings mean that we compel the insurance company which has made the common-law settlement in subrogation proceedings to come before our board. The case is referred to a commissioner. He, in turn, sends for the parties—employee, insurer of compensation rights, and a third party—and we thresh the whole thing out—investigate as to whether the settlement is a proper one and for the best interests of the employee—and we think that this is working out fairly satisfactorily; that is, the employee is protected.

There can not be any more of these reciprocity settlements of the insurance companies which leave the employee out in the cold. The law is practically new, but we have had a number of those agreements that have come back to us. I don't know whether anyone else has had experience with it.

Mr. DEANS (Virginia). May I ask when you enacted that in your law?

Mr. PARKS. About a year ago.

Mr. DEANS. We have had it in Virginia since 1919 and Indiana has had it since 1915.

Mr. PARKS. Those are things the members here ought to know. That is not, perhaps, a 100 per cent answer to the problem.

Mr. DEANS. There is the matter of the construction placed upon the statutes by the different courts of our States. It is not a question of what our supreme court does, but third-party settlement suits are generally in a court inferior to the court of last resort, and those judges have different views upon the same subject, which produces the conflict we have in these third-party suits. If there be anything in the excellent paper of Mr. Klaw, I would say that he

brought the attention of this association to one fact, and that is that we are hopelessly confused on this particular subject.

[The report of the nominating committee was presented and adopted. The list of officers elected will be found on page 327.]

[Mr. Parke P. Deans, the incoming president, took the chair and expressed his appreciation for the honor paid him and asked the cooperation of the members of the association during the coming year.]

[A motion to adopt Bulletin No. 511 of the Bureau of Labor Statistics as the official proceedings of the 1929 meeting was carried. Two motions were duly seconded and carried, one of which authorized the secretary-treasurer to endeavor to obtain a number of the slides used in Major General Gilchrist's talk for inclusion in the proceedings, and the other directed the secretary-treasurer to send letters of appreciation to all those who had prepared and sent papers to the convention but were unable to attend the convention themselves.]

[Richmond, Va., was chosen as the place of the next meeting, to be held October 5-9, 1931.]

[The convention adjourned.]

Appendixes

Appendix A.—Officers and Members of Committees for 1930–31

President, Parke P. Deans, member, Virginia Industrial Commission.
Vice president, Sam Laughlin, member, Oregon State Industrial Accident Commission.
Secretary-treasurer, Ethelbert Stewart, United States Commissioner of Labor Statistics.

EXECUTIVE COMMITTEE

Parke P. Deans, Virginia Industrial Commission.
Sam Laughlin, Oregon State Industrial Accident Commission.
Ethelbert Stewart, United States Commissioner of Labor Statistics.
Walter O. Stack, Delaware Industrial Accident Board.
W. H. Horner, Pennsylvania Department of Labor and Industry.
Wellington T. Leonard, Ohio Industrial Commission.
O. F. McShane, Utah Industrial Commission.
Frances Perkins, New York Department of Labor.
Robert Taschereau, Quebec Workmen's Compensation Commission.

COMMITTEE ON STATISTICS AND COMPENSATION INSURANCE COSTS

Chairman, L. W. Hatch, New York Department of Labor.
Secretary, Charles E. Baldwin, Assistant Commissioner, United States Bureau of Labor Statistics.
Albert J. Bailey, Connecticut Board of Compensation Commissioners.
Charles R. Blunt, New Jersey Department of Labor.
Albert E. Brown, Maryland Industrial Accident Commission.
E. I. Evans, Ohio Department of Industrial Relations.
O. A. Fried, Wisconsin Industrial Commission.
Sharpe Jones, Georgia Industrial Commission.
George A. Kingston, Ontario Workmen's Compensation Board.
William J. Maguire, Pennsylvania Department of Labor and Industry.
Howard B. Myers, Illinois Department of Labor.
Joseph A. Parks, Massachusetts Department of Industrial Accidents.
W. C. Preckel, North Dakota Workmen's Compensation Bureau.
O. E. Sharpe, Quebec Workmen's Compensation Commission.

MEDICAL COMMITTEE

Chairman, G. H. Gehrmann, M. D., Wilmington, Del.
Vice chairman, H. U. Stephenson, M. D., Richmond, Va.
Nelson M. Black, M. D., Wisconsin.
Emery R. Hayhurst, M. D., Columbus, Ohio.
Maurice Kahn, M. D., California.
Henry H. Kessler, M. D., Newark, N. J.
John J. Moorhead, M. D., New York, N. Y.
M. D. Morrison, M. D., Nova Scotia.
Frank L. Rector, M. D., Chicago, Ill.
C. W. Roberts, M. D., Atlanta, Ga.
Henry Field Smyth, M. D., Philadelphia, Pa.
C. H. Watson, M. D., New York, N. Y.

SAFETY COMMITTEE

Chairman, R. B. Morley, Industrial Accident Prevention Associations, Toronto, Ontario.

Vice chairman, John Roach, New Jersey Department of Labor.

Charles O. Beals, Maine Industrial Accident Commission.

Arthur Calverley, Wyoming Workmen's Compensation Department.

A. B. Funk, Iowa Workmen's Compensation Commission.

A. Gaboury, Province of Quebec Safety League.

S. Kjaer, United States Bureau of Labor Statistics.

Lee Ott, West Virginia Workmen's Compensation Department.

E. B. Patton, New York Department of Labor.

C. A. Pense, Illinois Department of Labor.

R. B. Sims, Arizona Industrial Commission.

Dan J. Sullivan, Nevada Industrial Commission.

G. W. Suppiger, Idaho Industrial Accident Board.

COMMITTEE ON REHABILITATION

Chairman, Fred W. Armstrong, Nova Scotia Workmen's Compensation Board.

G. Clay Baker, Kansas Commission of Labor and Industry.

Donald D. Garcelon, Maine Industrial Accident Commission.

H. M. Stanley, Georgia Industrial Commission.

Fred M. Wilcox, Wisconsin Industrial Commission.

COMMITTEE ON WORKMEN'S COMPENSATION LEGISLATION

Chairman, F. A. Duxbury, Minnesota Industrial Commission.

Matt H. Allen, North Carolina Industrial Commission.

James H. Davis, associated with the Ohio Industrial Commission.

Roscoe Kiper, Indiana Industrial Board.

Abel Klaw, associated with the Delaware Industrial Accident Board.

Appendix B.—Constitution of the International Association of Industrial Accident Boards and Commissions

ARTICLE I

This organization shall be known as the International Association of Industrial Accident Boards and Commissions.

ARTICLE II—*Objects*

SECTION 1. This association shall hold meetings once a year, or oftener, for the purpose of bringing together the officials charged with the duty of administering the workmen's compensation laws of the United States and Canada to consider, and, so far as possible, to agree on standardizing (a) ways of cutting down accidents; (b) medical, surgical, and hospital treatment for injured workers; (c) means for the reeducation of injured workmen and their restoration to industry; (d) methods of computing industrial accident and sickness insurance costs; (e) practices in administering compensation laws; (f) extensions and improvements in workmen's compensation legislation; and (g) reports and tabulations of industrial accidents and illnesses.

SEC. 2. The members of this association shall promptly inform the United States Bureau of Labor Statistics and the Department of Labor of Canada of any amendments to their compensation laws, changes in membership of their administrative bodies, and all matters having to do with industrial safety, industrial disabilities and compensation, so that these changes and occurrences may be noted in the Monthly Labor Review of the United States Bureau of Labor Statistics and the Canadian Labor Gazette.

ARTICLE III—*Membership*

SECTION 1. Membership shall be of two grades, active and associate.

SEC. 2. *Active membership.*—Each State of the United States and each Province of Canada having a workmen's compensation law, the United States Employees' Compensation Commission, the United States Bureau of Labor Statistics, and the Department of Labor of Canada shall be entitled to active membership in this association. Only active members shall be entitled to vote through their duly accredited delegates in attendance on meetings.

SEC. 3. *Associate membership.*—Any organization or individual actively interested in any phase of workmen's compensation or social insurance may be admitted to associate membership in this association by vote of the executive committee. Associate members shall be entitled to attend all meetings and participate in discussions, but shall have no vote either on resolutions or for the election of officers in the association.

SEC. 4. *Honorary life membership.*—Any person who has occupied the office of president or secretary of the association shall be ex officio an honorary life member of the association with full privileges.

ARTICLE IV—*Representation*

SECTION 1. Each active member of this association shall have one vote.

SEC. 2. Each active member may send as many delegates to the annual meeting as it may think fit.

SEC. 3. Any person in attendance at conferences of this association shall be entitled to the privileges of the floor, subject to such rules as may be adopted by the association.

ARTICLE V—*Annual dues*

SECTION 1. Each active member shall pay annual dues of \$50, except the United States Employees' Compensation Commission, the United States Bureau of Labor Statistics, and the Department of Labor of Canada, which shall be

exempt from the payment of annual dues: *Provided*, That the executive committee may, in its discretion, reduce the dues for active membership for those jurisdictions in which no appropriations are made available for such expenditures, making it necessary that the officials administering the law pay the annual dues out of their own pockets for the State.

SEC. 2. Associate members shall pay \$10 per annum.

SEC. 3. Annual dues are payable any time after July 1, which date shall be the beginning of the fiscal year of the association; dues must be paid before the annual meeting in order to entitle members to representation and the right to vote in the meeting.

ARTICLE VI—*Meetings of the association*

SECTION 1. An annual meeting shall be held at a time to be designated by the association or by the executive committee. Special meetings may be called by the executive committee. Notices for special meetings must be sent out at least one month in advance of the date of said meetings.

SEC. 2. At all meetings of the association the majority vote cast by the active members present and voting shall govern, except as provided in Article X.

ARTICLE VII—*Officers*

SECTION 1. Only officials having to do with the administration of a workmen's compensation law or bureau of labor may hold an office in this association, except as hereinafter provided.

SEC. 2. The association shall have a president, vice president, and secretary-treasurer.

SEC. 3. The president, vice president, and secretary-treasurer shall be elected at the annual meeting of the association and shall assume office at the last session of the annual meeting.

SEC. 4. If, for any reason, an officer of this association shall cease to be connected with any agency entitled to active membership before the expiration of his term, he may continue in office notwithstanding until the next annual meeting, but, if for any reason a vacancy occurs in the office of president, the executive committee shall appoint his successor.

ARTICLE VIII—*Executive committee*

SECTION 1. There shall be an executive committee of the association, which shall consist of the president, vice president, the retiring president, secretary-treasurer, and five other members, elected by the association at the annual meeting.

SEC. 2. The duties of the executive committee shall be to formulate programs for all annual and other meetings and to make all needed arrangements for such meetings; to pass upon applications for associate membership; to fill all offices which may become vacant; and in general to conduct the affairs of the association during the intervals between meetings. The executive committee may also reconsider the decision of the last annual conference as to the next place of meeting and may change the place of meeting if it is deemed expedient.

ARTICLE IX—*Quorum*

SECTION 1. The president or the vice president, the secretary-treasurer or his representative, and one other member of the executive committee shall constitute a quorum of that committee.

ARTICLE X—*Amendments*

This constitution or any clause thereof may be repealed or amended at any regularly called meeting of the association. Notice of any such changes must be read in open meeting on the first day of the conference, and all changes of which notice shall have thus been given shall be referred to a special committee, which shall report thereon at the last business meeting of the conference. No change in the constitution shall be made except by a two-thirds vote of the members present and voting.

Appendix C.—List of Persons Who Attended the Seventeenth Annual Meeting of the International Association of Industrial Accident Boards and Commissions, Held at Wilmington, Del., September 22–26, 1930

CANADA

Nova Scotia

Fred W. Armstrong, vice chairman, workmen's compensation board, Halifax.

Ontario

**Henry J. Halford, vice chairman, workmen's compensation board, Toronto.
Mrs. Henry J. Halford, Toronto.**

R. B. Morley, general manager, Industrial Accident Prevention Associations, Toronto.

J. F. H. Wyse, general manager, Canadian National Safety League, Toronto.

Quebec

Dr. Frank G. Pedley, Montreal General Hospital, Montreal.

O. E. Sharpe, workmen's compensation commission, Quebec.

UNITED STATES

Connecticut

Albert J. Bailey, board of compensation commissioners, Norwich.

Charles R. Brady, Travelers Insurance Co., Hartford.

Daniel G. Campion, attorney, Hartford.

P. F. Connor, Indemnity Insurance Co. of North America, Hartford.

H. W. Heinrich, assistant superintendent, Travelers Insurance Co., Hartford.

George S. Hubbard, Scovill Manufacturing Co., Waterbury.

Leo J. Noonan, board of compensation commissioners, Hartford.

S. P. Waskowitz, American Mutual Fire Insurance Co., Hartford.

Frederic M. Williams, chairman board of compensation commissioners, Waterbury.

Delaware

Dr. Olin S. Allen, Wilmington.

W. J. Andrews, American Car & Foundry Co., Wilmington.

Joseph Bancroft, Joseph Bancroft & Sons Co., Wilmington.

J. H. Barnholt, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

R. Harry Brown, industrial accident board, Wilmington.

Mrs. R. Harry Brown, Wilmington.

C. W. Dickey, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

Otto Dukes, American Car & Foundry Co., Wilmington.

F. C. Evans, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

E. H. Ford, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

George W. K. Forrest, mayor of Wilmington.

William B. Foster, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

Dr. G. H. Gehrmann, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

Daniel O. Hastings, United States Senator from Delaware.

Bayard Hearn, Lodbell Car Wheel Co., Wilmington.

Robert G. Houston, United States Representative from Delaware.

Robert K. Jones, industrial accident board, Wilmington.

Mrs. Robert K. Jones, Wilmington.
 William G. Keller, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 William H. Kiler, Hercules Powder Co., Wilmington.
 Abel Klaw, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 Isaac McClure, city treasurer, Wilmington.
 W. J. McKinney, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 J. B. McManus, secretary industrial accident board, Wilmington.
 Joseph McVey, Hercules Powder Co., Wilmington.
 G. H. Miller, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 D. R. Morton, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 Mrs. D. R. Morton, Wilmington.
 Barr J. Peterson, The Pullman Co., Wilmington.
 Dr. Richard H. Price, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 E. J. Riederer, Atlas Powder, Co., Wilmington.
 J. K. Schafer, jr., E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 H. F. Sedwick, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.
 J. S. Shaw, Hercules Powder Co., Wilmington.
 Albert L. Simm, attorney, Wilmington.
 Walter Dent Smith, Delaware Safety Council, Wilmington.
 Dr. James G. Spackman, Wilmington.
 W. J. Swain, industrial accident board, Wilmington.
 Mrs. W. J. Swain, Wilmington.
 Dr. Walter O. Stack, president industrial accident board, Wilmington.
 Mrs. Walter O. Stack, Wilmington.
 W. A. Staving, Hercules Powder Co., Wilmington.
 P. V. A. Tilden, E. I. du Pont de Nemours & Co. (Inc.), Wilmington.

District of Columbia

Charles E. Baldwin, assistant commissioner, United States Bureau of Labor Statistics.
 Rollin M. Clark, chief insurance division, United States Daily.
 Marie Correll, United States Women's Bureau.
 James J. Davis, United States Secretary of Labor.
 H. L. Gilchrist, Major General, chief Chemical Warfare Service, United States Army.
 Daniel Harrington, United States Bureau of Mines.
 Robert J. Hoage, United States Employees' Compensation Commission.
 S. Kjaer, United States Bureau of Labor Statistics.
 Mrs. E. Y. Larson, United States Bureau of Labor Statistics.
 Leifur Magnusson, American representative International Labor Office.
 Miss E. N. Matthews, United States Children's Bureau.
 Frank H. Myers, Tebbs & Myers, Washington, D. C.
 George H. Parker, Commonweal Fund, Union Trust Building.
 Charles F. Sharkey, United States Bureau of Labor Statistics.
 Ethelbert Stewart, United States Commissioner of Labor Statistics.
 Mrs. Glenn L. Tibbott, United States Bureau of Labor Statistics.
 Judge W. W. Warwick, United States Employees' Compensation Commission.

Georgia

Sharpe Jones, secretary-treasurer industrial commission, Atlanta.
 Hal M. Stanley, chairman industrial commission, Atlanta.

Idaho

Lawrence E. Worstell, chairman industrial accident board, Boise.

Illinois

E. R. Beckner, Chicago.
 Dr. T. R. Crowder, medical director The Pullman Co., Chicago.
 H. B. Myers, industrial commission, Chicago.
 H. H. Willoughby, industrial commission, Chicago.

Kansas

G. Clay Baker, chairman commission of labor and industry, Topeka.
 Mrs. G. Clay Baker, Topeka.
 C. J. Beckman, commission of labor and industry, Topeka.
 Mrs. C. J. Beckman, Topeka.

Maine

Donald D. Garcelon, chairman industrial accident commission, Augusta.
 Earle L. Russell, industrial accident commission, Augusta.

Maryland

Albert E. Brown, secretary State industrial accident commission, Baltimore.
 Miss R. O. Harrison, State industrial accident commission, Baltimore.
 Dr. Frederick C. Robbins, United States Veterans' Hospital, Perry Point.
 Dr. P. E. Wyse, Baltimore.

Massachusetts

John P. Meade, department of labor and industries, Boston.
 P. J. O'Neil, American Mutual Insurance Co., Boston.
 Joseph A. Parks, department of industrial accidents, Boston.
 Mrs. Joseph A. Parks, Boston.

Minnesota

F. A. Duxbury, industrial commission, St. Paul.
 Henry McColl, chairman industrial commission, St. Paul.
 O. E. Reaves, M. A. Hanna Co., Duluth.

New Jersey

Col. Charles R. Blunt, commissioner department of labor, Trenton.
 Mrs. Charles R. Blunt, Trenton.
 Charles E. Corbin, department of labor, Trenton.
 Mrs. Charles E. Corbin, Trenton.
 Agnes Fitzpatrick, department of labor, Trenton.
 Dr. H. H. Kessler, Newark.
 A. R. Lawrence, New Jersey Compensation Rating and Inspection Bureau,
 Newark.
 Frank J. O'Connor, E. I. du Pont de Nemours & Co. (Inc.), Penns Grove.
 John Roach, deputy commissioner department of labor, Trenton.
 Fred Rosseland, Newark Safety Council, Newark.
 C. M. Senft, Globe Indemnity Insurance Co., Newark.
 A. M. Torrey, secretary Employees' Association of New Jersey, Newark.
 Charles H. Weeks, deputy commissioner department of labor, Trenton.
 Mrs. Charles H. Weeks, Trenton.

New York

Miss M. M. Ansell, Master Reporting Co., New York.
 W. Graham Cole, Metropolitan Life Insurance Co., New York.
 R. M. Crater, American Telephone & Telegraph Co., New York.
 James L. Gernon, department of labor, New York.
 L. W. Hatch, industrial board, department of labor, New York.
 Mrs. L. W. Hatch, New York.
 Dr. G. B. Hutchins, Syracuse.
 Dr. John J. Moorhead, Post Graduate Hospital, New York.
 E. B. Patton, department of labor, New York.
 Mrs. E. B. Patton, New York.
 Frances Perkins, industrial commissioner, department of labor, New York.
 Charles G. Smith, manager State Insurance Fund, New York.
 Mrs. Charles G. Smith, New York.
 Dr. C. H. Watson, American Telephone & Telegraph Co., New York.
 Ruth A. Yerion, Commonweal Fund, New York.

North Carolina

Maj. Matt H. Allen, chairman industrial commission, Raleigh.
 Mrs. Matt H. Allen, Raleigh.
 John C. Root, industrial commission, Raleigh.

North Dakota

W. C. Preckel, workmen's compensation bureau, Bismarck.
 W. H. Stutsman, workmen's compensation bureau, Bismarck.

Ohio

Carl C. Beasor, department of industrial relations, Columbus.
 E. I. Evans, department of industrial relations, Columbus.
 Ross Hedges, department of industrial relations, Columbus.
 Thomas P. Kearns, department of industrial relations, Columbus.
 F. C. Kettering, M. A. Hanna Co., Cleveland.
 Wellington T. Leonard, chairman industrial commissioner, Columbus.
 Mrs. Wellington T. Leonard, Columbus.
 W. E. Obetz, department of industrial relations, Columbus.
 B. A. Patch, Grasselli Chemical Co., Cleveland.
 E. E. Watson, consulting actuary, Columbus.
 Mrs. E. E. Watson, Columbus.

Oklahoma

I. K. Huber, The Empire Cos., Bartlesville.

Oregon

Sam Laughlin, State industrial accident commission, Salem.

Pennsylvania

Dr. Wm. Bates, Jarka Corporation, Philadelphia.
 J. E. Culliney, manager of safety, Bethlehem Steel Co., Bethlehem.
 Ralph Dinsmore, Warner Co., Philadelphia.
 Dr. Francis C. Grant, University of Pennsylvania.
 W. H. Horner, department of labor and industry, Harrisburg.
 Harry D. Immel, department of labor and industry, Harrisburg.
 Gregory C. Kelly, general manager, Pennsylvania Compensation Rating and
 Inspection Bureau, Philadelphia.
 Walter Linn, secretary Pennsylvania Self-Insurers' Association, Philadelphia.
 William J. Maguire, department of labor and industry, Harrisburg.
 Augustus P. Norton, United States Employees' Compensation Commission,
 Philadelphia.
 L. Charles Oblon, assistant sales manager, Belber Co., Philadelphia.
 William Sherwood, Warner Co., Philadelphia.
 Dr. Henry F. Smyth, University of Pennsylvania, Philadelphia.
 E. C. Ware, Jarka Corporation of Philadelphia, Philadelphia.

Porto Rico

P. Rivera Martinez, industrial commission, San Juan.

Rhode Island

Edward L. Byers, commissioner, department of labor, Providence.

Texas

Gabe Sheppard, United States Employees' Compensation Commission, Gal-
 veston.

Utah

O. F. McShane, industrial commission, Salt Lake City.

Virginia

Parke P. Deans, industrial commission, Richmond.
Frank P. Evans, industrial commission, Richmond.
W. L. Robinson, industrial commission, Richmond.
Mrs. W. L. Robinson, Richmond.

West Virginia

Lewis J. Frey, workmen's compensation department, Charleston.
Mrs. Lewis J. Frey, Charleston.
Dr. Russel Kessel, workmen's compensation department, Charleston.
Lee Ott, commissioner, workmen's compensation department, Charleston.
J. W. Smiley, workmen's compensation department, Charleston.

Wisconsin

A. J. Altmeyer, industrial commission, Madison.
Mrs. A. J. Altmeyer, Madison.
Fred M. Wilcox, chairman industrial commission, Madison.

Appendix D.—Letter from F. M. Wilcox, Chairman Industrial Commission of Wisconsin, re Cost of Occupational Disease Coverage

STATE CAPITOL,
Madison, January 5, 1931.

HON. ETHELBERG STEWART,
*Commissioner of Labor Statistics,
United States Department of Labor,
Washington, D. C.*

MY DEAR MR. STEWART: The very first article appearing in the October, 1930, issue of the Bulletin of the Association of Casualty and Surety Executives, reads as follows:

The American Labor Legislation Review has come out again in its June number with a misleading article regarding occupational diseases. It criticizes the New York Legislature for adding to the schedule of occupational diseases in the workmen's compensation law, instead of adopting one or another of several measures which would have amended that law to cover injuries to health indefinitely. And it alleges that "the casualty rate makers have written that they would recommend a rate of increase (in insurance premiums) of not over 1 per cent if a State which did not compensate occupational diseases should by amendment include them all.*"

In regard to this last allegation, it ought to be realized that if any rate maker ever made such a loose statement it was with some definite meaning of the term "occupational diseases" in mind. Certainly it was not intended to mean, what is absurd, that accident compensation insurance can be extended to cover injuries to health, indefinitely, at an additional cost of only 1 per cent.

The issue is really simple: Granting that "occupational diseases" should be compensable, ought they be defined (whether by listing them in a schedule or otherwise) or ought they be left undefined, so that they may be construed by the administrative authorities to include all injuries to health in any degree, manner or sense "arising out of the employment," thereby converting the compensation law into a measure of health insurance. The latter is the objection of the American Labor Legislation Review; and to aid in the attainment of that objective it is deliberately befogging the issues.—P. Tecumseh Sherman.

The reference at the foot of the page (indicated by the asterisk) reads as follows:

A similar misrepresentation was made at the meeting of the International Association of Industrial Accident Boards and Commissions, October, 1929.

I wrote the association on November 14th, inquiring as to whom was responsible for the footnote and for reference to the place where misrepresentations are to be found in the report of the proceedings of the Buffalo meeting. The reply comes from Mr. Sherman and is as follows:

Occupational Diseases

There has been referred to me a letter from you to the Association of Casualty and Surety Executives, dated November 14, in which you inquire about a footnote to an article on occupational diseases on page 3 of the last issue of the Bulletin of the Association of Casualty and Surety Executives.

In response, I write to say that I am responsible for the article and footnote in question and that such footnote refers to matter on page 63 of Bulletin No. 511 of the United States Bureau of Labor Statistics (entitled, "Proceedings of the Sixteenth Annual Meeting of the International Association of Industrial

Accident Boards and Commissions"), which implies that there is no gain-saying the proposition that all occupational diseases, in the broadest sense, regardless of definition, can assuredly be covered at an insignificant increase in the compensation cost.

Referring to page 63 of the report of the Buffalo meeting, it will be noted that you and I were alone in the making of representations as to the cost of occupational disease coverage—you in quoting the statement of Mr. Leslie of the National Council, and I in presenting the experience of Wisconsin for eight or nine years. It is quite apparent that Mr. Sherman challenges my representations rather than your report of Mr. Leslie's figures. However that may be, I am ready to defend the figures that were used and also the resolution adopted by the association commending full coverage of occupational diseases by the States and estimating the cost at approximately 1 per cent.

The article by Doctor Andrews was one criticising the influences that succeeded in keeping the New York Legislature from adopting an amendment to provide compensation to all workers disabled by disease directly caused by their employment, notwithstanding party pledges so to legislate. The article appeared in June, 1930.

This Association of Casualty and Surety Executives waited until the eve before the general convening of legislatures to come through with their attack upon Doctor Andrews and with more of the same type of propaganda that has defeated legislation in other years. And it waited until they were well past chance of deserved attention by the International Association of Industrial Accident Boards and Commissions, at its Wilmington meeting. The program of the Association of Casualty and Surety Executives is easily recognized and I want to see it challenged.

Many States will be considering legislation for the coverage of occupational diseases, and compensation boards and commissions will be calling on your department for information. I am now able to give you a complete tabulation of the experience of Wisconsin for the 10-year period, 1920 to 1929, inclusive. (Bulletin No. 24, Wisconsin Labor Statistics, attached.¹) By March 1, I think I can give you completely detailed experience for 1930.

Wisconsin does not tabulate this experience because of any need of it for legislative purpose. We have a full coverage provision, and, what is more, it was enacted without opposition and upon the recommendation of the employer group as well as by the employees. The principal service of this tabulated experience to my State lies in the fact that it enables employers better to understand the nature and degree of hazard in their operations and what their failure to give protection is really costing them. There has been no manipulation of the figures, no incentive or excuse for misrepresentation.

You will note from Bulletin No. 24 that during the 10-year period ended December 31, 1929, we disposed of 3,019 cases of occupational disease. The indemnity benefits aggregated \$576,264, and the medical benefits, \$140,688, or a total of \$716,952. In that same period the total number of cases disposed of aggregated 200,791, for which indemnity of \$31,553,150 was paid, and the cost of the medical service was \$10,076,266, amounting in all to \$41,629,376.

As I stated at the Buffalo meeting, we tabulate under the head of "occupational diseases" all cases not usually thought of as "accidental injuries." That carries into the published experience many cases that are compensable under laws providing coverage for accidental injuries only; for example, caisson

¹ Statistics of the Wisconsin experience for 1920 to 1929, taken from this bulletin, are shown on p. 340.

disease, carbon-monoxide poisoning, freezing, heat stroke, typhoid fever, anthrax, and ivy, oak, hemlock, and like types of poisoning. It is a large group of cases that are drawing benefits in this State and all States, regardless of legislation on occupational diseases as a class.

Mr. Fried has determined that not less than 45 per cent of the cost of cases carried in his tabulation of the occupational disease experience of this State falls within the class that does not depend on the "occupational disease amendment" to secure benefits. When proper deduction is made for such account the cost of our full coverage amendment for the 10-year period is about \$385,000 out of \$41,629,000.

This is slightly less than 1 cent out of each dollar. While students of the subject will understand that the occupational disease hazard is likely to vary somewhat from State to State, there is no reason for believing that the hazard for the country as a whole averages more serious than for Wisconsin, and this observation is supported by the experience of the States that now compensate this type of injury.

Whether the added cost will prove to be 1 cent or 2 cents or 5 cents on the dollar or any other figure is not material. It is a question of the responsibility of a State to provide morally upright legislation. Are we, because of pennies, willing to tolerate longer within the otherwise beneficial provisions of our compensation laws the rawest and most unconscionable piece of discrimination that was ever conceived? Are we to continue paying generous credit to a system that cares for those who suffer injuries to the head, the hands, the feet, but denies relief to him who suffers injury to the heart, the kidneys, the lungs, out of the same identical employment and with less, if anything, of personal responsibility? It is high time we ceased back-paddling on matters of principle and right, and guarded against the adoption of laws or the continuance of laws which the laborer has assumed to be in response to basic principles, only to find that they are instruments for unfair discrimination and filled with avenues for denial of his rights.

And now a bit of attention to Mr. Sherman and his insurance organization for their pains in developing and using such expressions, as "to cover injuries to health indefinitely," and "undefined so that they may be construed by administrative authorities to include all injuries to health in any degree, manner or sense," and "converting the compensation law into a measure of health insurance," and "covering all occupational diseases, in the broadest sense, regardless of definition,"—these from men who charge Dr. Andrews and the Review with "deliberately befogging the issues."

If there is one underlying purpose in workmen's compensation it is to provide a measure of relief for those employees who suffer injury because of the hazards of their work or of the work premises. And if that be a just estimate, then what legitimate excuse remains for denying benefits to an employee just because the particular type of injury sustained by him out of his employment required a week or a month to develop instead of a day or that it is not found listed in some schedule? There is not a whit better moral response in a law that provides benefits to the falling scaffold worker for his fractured limbs and at the same time denies benefits to his fellow-worker for his fractured skull than there is in a law that compensates for lead poisoning and denies benefits to the sufferer from silicosis, each from occupational exposure. There is nothing honorable in the schedule system. The reason back of a schedule is not based upon concern over general health

insurance and the alleged worries of those opponents of full coverage. The real down-to-the-bottom purpose is to protect from liability those industries that expose their men to the grinding and polishing and chipping processes and from which their men contract silicosis and pneumoconiosis and tuberculosis.

When legislators come to understand and to have the purpose to put the burden of diseases of occupation where it belongs, they can be certain that merely limiting liability to those injuries that "grow out of and are incidental to the employment" is abundantly sufficient protection to the employer. It is just as adequate for the purpose in the matter of diseases of occupation as it is in the case of accidental injuries. As to the alleged concern of Mr. Sherman about the proposal to cover all occupational diseases "in the broadest sense," that phrase, as would also "narrowest sense," becomes a meaningless term when the disease to which applied must necessarily have been caused by the hazards of the employment. That and the other expressions are studied efforts and are brought forth for the purpose of overreaching and unduly influencing the public mind. They are just "tears in the voice" of one who pleads the case of the dusty and disease-producing trades.

It should be remembered that the employees of these insurance companies have no material exposure to any occupational disease hazard, and so their activity is not based on personal concern. It would be interesting to know whether the home offices of these companies are really indorsing propaganda for the defeat of full coverage of diseases of occupation.

I hope that Governor Roosevelt has gathered sufficient legislative support so that he can give to his State the type of full coverage for which he has battled in the past, and that New York will make this insurance crowd understand that when the measure of compensation benefits (not procedure) is the issue to be determined, their place is back behind the railing along with the curious spectators instead of down in front with the court and jury.

I do not criticize those who have accepted schedules when opposition made it impossible to get full coverage. Schedules have been the indirect means of bringing benefits to large numbers of the diseased of industry who would have otherwise been left to bear the burden alone. But I do challenge the group that encourages use of schedules, for the purpose of denying benefits to any man who contracts disease as a hazard of his employment. When employed for such purpose a schedule becomes plain crooked. If it had nosed into any other piece of legislation but workmen's compensation, perhaps it might deserve tolerance, but as it affects this field of social response it is just poison to the basic purpose—and all to save a dollar.

The danger in a schedule is not alone to the State that adopts it. It is harmful to other States in this—that their legislative bodies may elect to follow precedent. And that is why I do so hope that New York, New Jersey, Ohio, and Minnesota will this year adopt full coverage amendments in lieu of their schedules and in that way give needed support to the States that have as yet taken no action whatever.

Let me know if I can be helpful anywhere.

Sincerely yours,

F. M. WILCOX,
Chairman Industrial Commission.

TABLE 1.—Summary of diseases¹ of occupation compensated in Wisconsin, 1920 to 1929

Hazards causing disabilities	Total number of cases	Injuries classified as—			Weighted number of days time loss	Total amount of indemnity paid	Amount of medical aid paid ²	Average indemnity per case	Average medical aid per case
		Deaths and permanent total disabilities	Permanently partial disabilities	Temporary injuries					
All occupational disease hazards.....	3,019	72	36	2,911	551,089	\$76,264	\$140,688	\$191	\$47
Metallic poisons.....	269	2	2	265	29,676	41,543	17,310	154	64
Toxic vapors, gases and fumes.....	353	27	3	323	176,371	146,005	18,499	414	52
Toxic fluids.....	840	-----	1	839	19,515	43,874	28,639	52	34
Irritant dusts and fibers.....	396	16	3	377	110,317	117,871	16,335	298	41
Germs.....	202	8	2	192	58,499	64,943	20,055	322	99
Miscellaneous irritants.....	320	1	3	316	14,595	15,050	7,412	47	23
Air compression.....	80	1	4	75	13,446	15,495	3,854	194	48
Extremes of humidity.....	49	2	1	46	16,542	18,426	2,057	376	42
Extremes of temperature.....	189	9	2	178	60,591	49,158	10,174	260	54
Excessive light.....	22	-----	-----	22	376	829	587	38	27
Abnormal positions of body.....	202	1	9	192	14,944	19,204	9,625	95	48
Occupational diseases not otherwise classified.....	97	5	6	86	36,217	42,654	7,190	440	74

¹ Covering also other disabilities of a nonaccidental origin; e. g. inflammation of tendons and joints due to abnormal bodily postures, etc.

² Inclusive of contract medical aid cases, which are covered in at the average cost per case shown by fee cases.

TABLE 2.—Occupational disease cases compensated in Wisconsin, 1920 to 1929

Cause and year	Number of cases	Injuries classified as—			Weighted number of days time loss	Total indemnity paid	Medical aid paid
		Deaths and permanent total disabilities	Permanently partial disabilities	Temporary disability injuries			
All occupational disease cases:							
1920.....	38	1	-----	37	6,793	\$4,479	\$900
1921.....	235	5	5	225	42,105	33,311	8,353
1922.....	281	6	5	270	52,062	52,483	10,650
1923.....	338	7	7	324	58,358	55,495	18,239
1924.....	299	3	2	294	28,485	37,680	13,007
1925.....	282	10	3	269	69,722	59,146	16,594
1926.....	340	11	2	327	81,099	78,970	13,437
1927.....	397	8	4	385	59,383	73,743	17,338
1928.....	395	10	5	380	74,702	83,093	17,134
1929.....	414	11	3	400	78,380	97,864	25,036
Total.....	3,019	72	36	2,911	551,089	576,264	140,688
Average per case.....	-----	-----	-----	-----	183	191	47
Metallic poisons:							
1920.....	2	-----	-----	2	30	44	27
1921.....	17	-----	-----	17	888	2,139	1,123
1922.....	24	-----	1	23	3,086	3,063	994
1923.....	34	2	-----	32	13,552	8,274	3,373
1924.....	26	-----	-----	26	1,073	2,803	1,214
1925.....	22	-----	-----	22	545	1,480	726
1926.....	38	-----	1	37	5,609	10,267	2,364
1927.....	36	-----	-----	36	1,978	5,627	1,816
1928.....	37	-----	-----	37	1,179	3,297	2,653
1929.....	33	-----	-----	33	1,736	4,529	3,020
Total.....	269	2	2	265	29,676	41,543	17,310

TABLE 2.—Occupational disease cases compensated, Wisconsin, 1920-1929—Con.

Cause and year	Number of cases	Injuries classified as—			Weighted number of days time loss	Total indemnity paid	Medical aid paid
		Deaths and permanent total disabilities	Permanently partial disabilities	Temporary disability injuries			
Toxic vapors, gases, and fumes:							
1920	6	1		5	6, 115	\$3, 237	\$237
1921	37	4		33	24, 860	13, 723	1, 787
1922	51	2	1	48	14, 575	16, 036	2, 495
1923	42	2	1	39	14, 713	12, 293	2, 431
1924	44	1		43	7, 946	9, 977	1, 461
1925	22	3		19	18, 332	13, 367	1, 101
1926	46	6		40	38, 238	23, 827	3, 061
1927	31	3		28	18, 540	18, 201	1, 432
1928	34	4	1	29	26, 126	27, 449	2, 203
1929	40	1		39	6, 926	7, 895	2, 291
Total	353	27	3	323	176, 371	146, 005	18, 499
Toxic fluids:							
1920	11			11	247	443	241
1921	64			64	1, 527	2, 932	1, 524
1922	79			79	1, 866	3, 633	1, 965
1923	108		1	107	2, 824	5, 411	3, 469
1924	80			80	1, 706	3, 616	2, 864
1925	89			89	1, 879	4, 268	3, 416
1926	74			74	1, 495	3, 301	2, 222
1927	103			103	2, 386	5, 547	3, 974
1928	124			124	2, 941	7, 200	3, 834
1929	108			108	2, 644	7, 523	5, 100
Total	840		1	839	19, 515	43, 874	28, 639
Irritant dusts and fibers:							
1920	3			3	45	81	75
1921	21			21	470	1, 081	536
1922	26			26	510	988	604
1923	39	1		38	6, 847	6, 346	1, 036
1924	37	1	1	35	8, 247	7, 745	1, 200
1925	43	3	1	39	22, 031	24, 181	4, 120
1926	44	2		42	13, 127	14, 005	1, 018
1927	75	2		73	13, 708	15, 223	2, 626
1928	62	3	1	58	19, 627	16, 374	2, 672
1929	46	4		42	25, 705	31, 847	2, 445
Total	396	16	3	377	110, 317	117, 871	16, 335
Germs:							
1921	5		1	4	391	535	199
1922	20			20	1, 053	2, 532	1, 757
1923	31	1	1	29	9, 560	10, 293	5, 387
1924	23			23	1, 244	3, 013	2, 498
1925	14	1		13	6, 476	6, 071	884
1926	32	1		31	6, 983	8, 033	1, 813
1927	16			16	430	994	1, 192
1928	26			26	644	1, 457	1, 122
1929	35	5		30	31, 713	32, 015	5, 203
Total	202	8	2	192	58, 499	64, 943	20, 055
Miscellaneous irritants:							
1920	2			2	17	12	19
1921	32		1	31	2, 321	2, 879	872
1922	23			23	813	1, 574	505
1923	26			26	435	867	532
1924	29			29	512	927	447
1925	29			29	513	1, 040	545
1926	34			34	461	774	430
1927	43		2	41	1, 630	3, 400	785
1928	47	1		46	6, 827	1, 568	1, 255
1929	55			55	1, 066	2, 009	1, 972
Total	320	1	3	316	14, 595	15, 050	7, 412
Air compression:							
1921	10			10	397	896	401
1922	4		1	3	2, 760	1, 122	108
1924	9			9	158	369	295
1925	3		1	2	121	164	169
1926	6			6	138	363	277

TABLE 2.—Occupational disease cases compensated, Wisconsin, 1920—1929—Con.

Cause and year	Number of cases	Injuries classified as—			Weighted number of days time loss	Total indemnity paid	Medical aid paid
		Deaths and permanent total disabilities	Permanently partial disabilities	Temporary disability injuries			
Air compression—Continued.							
1927	27	1		26	6,406	\$6,595	\$1,357
1928	5			4	3,057	4,791	223
1929	16		1	15	400	1,195	1,024
Total	80	1	4	75	13,446	15,495	3,854
Extremes of humidity:							
1921	3		1	2	3,036	1,931	247
1922	8	1		7	6,153	5,216	690
1923	6			6	645	1,739	239
1924	4			4	155	442	167
1925	5			5	111	280	93
1926	7			7	142	338	155
1927	3			3	60	72	54
1928	8	1		7	6,100	8,018	293
1929	5			5	140	390	119
Total	49	2	1	46	16,542	18,426	2,057
Extremes of temperature:							
1920	9			9	270	569	196
1921	13			13	239	458	361
1922	22	2	1	19	14,478	12,300	698
1923	16	1		15	6,420	5,212	493
1924	19			18	6,539	6,600	1,115
1925	22	3		19	18,576	5,445	4,182
1926	25	1		24	6,625	7,948	781
1927	17	1	1	15	6,436	8,222	686
1928	19			19	305	647	401
1929	27			27	703	1,757	1,261
Total	189	9	2	178	60,591	49,158	10,174
Excessive light:							
1920	1			1	8	5	2
1922	1			1	7	3	11
1923	2			2	28	36	24
1924	2			2	27	43	31
1925	2			2	22	30	33
1926	3			3	33	38	164
1927	4			4	104	271	89
1928	3			3	71	179	110
1929	4			4	76	224	123
Total	22			22	376	829	687
Abnormal positions of body:							
1920	4			4	61	88	100
1921	27	1	2	24	7,489	5,991	953
1922	16		1	15	644	537	342
1923	30		4	26	3,276	4,919	1,147
1924	16			16	469	1,168	739
1925	17		1	16	701	1,814	779
1926	6			6	74	114	245
1927	23			23	517	1,116	670
1928	23			23	783	2,140	1,489
1929	40		1	39	930	1,317	3,161
Total	202	1	9	192	14,944	19,204	9,625
Occupational disease not otherwise classified:							
1921	6			6	487	746	350
1922	7	1		6	6,117	5,449	451
1923	4			4	58	105	58
1924	10		1	9	409	977	976
1925	14			14	415	1,006	546
1926	25	1	1	23	8,169	9,972	907
1927	19	1	1	17	7,188	8,475	2,415
1928	7	1	2	4	7,042	9,973	958
1929	5	1	1	3	6,332	5,951	529
Total	97	5	6	86	36,217	42,654	7,190

INDEX TO PROCEEDINGS OF INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS, 1930

Subject Index

A

Accident prevention :

- Building trades. Bul. 536, pp. 141-142, 156.
- Education (Kearns). Bul. 536, pp. 161-171, 155, 192, 206, 212, 214.
- Factory inspection (Meade). Bul. 536, pp. 139-161, 133, 162, 166.
- Foremen, key men (O'Connor). Bul. 536, pp. 208-215, 205.
- Human element. Bul. 536, pp. 197, 216.
- Small plants. Bul. 536, pp. 143-144, 152-153, 163, 167.
- States and Territories—
 - Delaware. Bul. 536, p. 8.
 - New York. Bul. 536, pp. 182-183.
 - Pennsylvania. Bul. 536, pp. 219-225.
- Value of. Bul. 536, pp. 163, 164, 170, 183.

(See also Accident statistics; Mechanical safeguards; Safety codes.)

Accident reporting :

- Accident reports and insurance rates (Kelly). Bul. 536, pp. 106-121.
- Ohio. Bul. 536, p. 166.

Accident statistics :

- Accident prevention (Lawrence). Bul. 536, pp. 215-219.
- (Maguire). Bul. 536, pp. 219-230, 155, 166, 195-198.
- Forms. Bul. 536, pp. 222-224.
- Industry, classification of. Bul. 536, pp. 116-117, 120-121.
- Need for. Bul. 536, pp. 195-198, 229, 234-235.
- Standardization, revision of plan of (Hatch). Bul. 536, pp. 247-248.
- States and Territories :
 - Pennsylvania. Bul. 536, pp. 219-225.
 - Georgia. Bul. 536, p. 234.
 - Ohio. Bul. 536, p. 166.
 - Utah. Bul. 536, p. 228.

Accidents, industrial :

- Coal mining, effect of mechanization (Harrington). Bul. 536, pp. 183-192.
 - Cost of (Heinrich). Bul. 536, pp. 171-183, 7, 193, 195, 206.
 - Definition. Bul. 536, p. 195.
 - Falls. Bul. 536, p. 204.
 - Handling-material accidents (Cole). Bul. 536, pp. 194-207.
 - International medical congress. Bul. 536, pp. 17-18.
 - Lighting. Bul. 536, pp. 154-155.
 - Machinery. Bul. 536, pp. 8, 150, 183-192.
 - Number of. Bul. 536, pp. 7, 8, 101-102, 150-151, 155-156, 172, 173, 228.
 - States and Territories—
 - Canada. Bul. 536, p. 8.
 - District of Columbia. Bul. 536, pp. 101-102.
 - Massachusetts. Bul. 536, p. 150.
 - New Jersey. Bul. 536, pp. 155-156.
 - Utah. Bul. 536, p. 228.
 - Who pays for. Bul. 536, pp. 178-179, 262.
 - Women. Bul. 536, pp. 9-10.
- (See also Willful misconduct.)

Administration :

- District of Columbia. Bul. 536, pp. 103-105.
- Longshoremen's and harbor workers' compensation act. Bul. 536, pp. 56, 84-89.
- Porto Rico. Bul. 536, p. 237.
- Power to compel testimony (Allen). Bul. 536, pp. 60-74, 111-112.

- Age, factor in permanent disabilities. Bul. 536, pp. 134-135, 136.
 Agreements, voluntary. (*See* Direct settlements.)
 All American Workmen's Compensation Law Conference. Bul. 536, pp. 16, 323.
 American remarriage table. Bul. 536, pp. 15, 17.
 American Telephone and Telegraph Co., employment of heart disease cases. Bul. 536, p. 315.
 Anthrax. Bul. 536, pp. 147-148.
 Appeal, right of:
 District of Columbia. Bul. 536, pp. 69-70, 101.
 Longshoremen's and harbor workers' act. Bul. 536, pp. 84-85, 86-87.
 Porto Rico. Bul. 536, p. 241.
 United States. Bul. 536, p. 84.
 Arising out of and in course of employment. Bul. 536, p. 100.
 (*See also* Willful misconduct.)
 Attorneys. (*See* Lawyers.)

B

- Benzol poisoning. Bul. 536, pp. 35, 37, 158, 316-322.
 Blindness:
 Industrial. Bul. 536, p. 11.
 War casualties. Bul. 536, pp. 296, 302.
 Bone injuries. (*See* Head injuries.)
 Border-line cases:
 Maritime workers. Bul. 536, pp. 49-58, 86.
 Willful misconduct. Bul. 536, pp. 91-100, 112.
 Brain injuries. Skull fractures (Moorhead). Bul. 536, pp. 281-293.
 Burial expenses. (*See* Funeral expenses.)
 Building industry. Accident prevention. Bul. 536, pp. 141-142 156.

C

- Cardiac disease. (*See* Heart disease.)
 Chemical cases, effects of (Gilchrist). Bul. 536, pp. 293-307.
 Chemical warfare service. (*See* Chemical cases.)
 Children. (*See* Minors.)
 Claim procedure. Longshoremen's and harbor workers' act. Bul. 536, p. 88.
 Cleveland Clinic disaster. Bul. 536, pp. 296-297, 304-306, 322.
 Coal. (*See* Mining.)
 Colleges. (*See* Schools and colleges.)
 Committees. (*See* International Association of Industrial Accident Boards and Commissions, convention and standing committees; committees under specific subjects.)
 Commutations. (*See* Lump-sum settlements.)
 Compensation. (*See* Workmen's compensation.)
 Compensation payments, termination of. Bul. 536, p. 88.
 Construction industry. (*See* Building industry.)
 Costs:
 Accidents (Heinrich). Bul. 536, pp. 171-183, 7, 193, 195, 206.
 Medical. Bul. 536, p. 238.
 Occupational disease coverage (Wilcox). Bul. 536, pp. 336-342.
 Workmen's compensation. Bul. 536, pp. 172-173, 192-193.
 Court decisions:
 Expert testimony. Bul. 536, p. 64.
 Longshoremen and harbor workers. Bul. 536, pp. 85-86.
 Maritime workers. Bul. 536, pp. 12, 50-54, 56, 57-58.
 Second injuries. Bul. 536, p. 268.
 Third-party cases. Bul. 536, pp. 76-82.
 Willful misconduct. Bul. 536, pp. 91-92, 93, 98.
 Coverage:
 District of Columbia. Bul. 536, pp. 89, 101.
 Massachusetts. Bul. 536, p. 11.
 New York. Bul. 536, p. 11.
 Occupational diseases (Wilcox). Bul. 536, pp. 336-342, 33-34.
 Porto Rico. Bul. 536, p. 236.
 Saskatchewan. Bul. 536, p. 11.
 Cripples, reemployment of. (*See* Handicapped.)

D

- Deafness. Bul. 536, p. 254.
 Death benefits, Porto Rico. Bul. 536, p. 237.
 Decisions, workmen's compensation cases. (*See* Court decisions.)
 Diagnosis. Bul. 536, pp. 37, 38-39, 290-291, 293.
 Direct settlements:
 Longshoremen's and harbor workers' act. Bul. 536, p. 89.
 Porto Rico. Bul. 536, p. 241.
 Disability rating. (*See* Permanent disabilities.)
 Dismemberment. Bul. 536, p. 266.
 District of Columbia compensation law (Hoage). Bul. 536, pp. 100-106.
 Dusts, industrial. (*See* Silicosis.)

E

- Ear. (*See* Deafness.)
 Education. (*See* Accident prevention; Lawyers; Schools and colleges.)
 Encephalograms. Bul. 536, pp. 286-288, 289.
 Epilepsy. Bul. 536, p. 284.
 Executive committee, I. A. I. A. B. C. Bul. 536, p. 327.
 Extraterritoriality:
 Constitutionality of. Bul. 536, pp. 2-3.
 President's address, committee on. Bul. 536, p. 324.
 Eye injuries. (*See* Blindness.)

F

- Factory inspection and safety (Meade). Bul. 536, pp. 139-161, 133, 162, 166.
 Fatigue. Lighting, relation to. Bul. 536, pp. 154-155.
 Follow-up, committee on. Bul. 536, p. 30.
 Foremen, key men (O'Connor). Bul. 536, pp. 208-215, 205.
 Forms, accident, Pennsylvania. Bul. 536, pp. 222-224.
 Fractured skulls (Moorhead). Bul. 536, pp. 281-293.
 Funeral expenses:
 District of Columbia. Bul. 536, p. 102.
 Virginia. Bul. 536, p. 11.

G

- Gases:
 Chemical, effects of (Glchrist). Bul. 536, pp. 293-307.
 Refrigerating. Bul. 536, pp. 306, 307.
 George Washington celebration. Bul. 536, pp. 18-19, 323.

H

- Handicapped, employment of:
 (Allen.) Bul. 536, pp. 307-316, 254.
 (Bancroft.) Bul. 536, pp. 262-272.
 (Pedley.) Bul. 536, pp. 249-262.
 Hazardous employments, minors. Bul. 536, p. 265.
 Head injuries:
 Encephalograms. Bul. 536, pp. 286-288, 289.
 Skull fractures (Moorhead). Bul. 536, pp. 281-293.
 Hearings:
 Longshoremen's and harbor workers' act. Bul. 536, p. 88.
 North Carolina. Bul. 536, pp. 60, 69.
 Porto Rico. Bul. 536, p. 240.
 Power to compel testimony (Allen). Bul. 536, pp. 60-74.
 Heart disease. Employment (Allen). Bul. 536, pp. 307-316, 254.
 Hernia. Bul. 536, pp. 254, 265.
 Hygiene. (*See* Industrial hygiene.)
 Hysteroneurasthenia. Bul. 536, p. 284.

I

- Industrial hygiene:
 Bibliography. Bul. 536, pp. 25-27.
 (*See also* Schools and colleges, industrial medical course in.)
 Industrial medicine. (*See* Schools and colleges, industrial medical course in.)
 Industrial poisoning, Massachusetts. Bul. 536, p. 146.
 (*See also* Occupational diseases, and specific diseases.)
 Industrial relations, effect of workmen's compensation laws. Bul. 536, p. 1.
 Industrial surgery. Bul. 536, pp. 34, 36, 37-38.
 Industry, classification of. Bul. 536, pp. 116-117, 120-121.
 Insanity. Bul. 536, p. 284.

- International Association of Industrial Accident Boards and Commissions:
 Colleges and universities, cooperation with. (*See* Medical committee, report of.)
 Committees. Appointment and report, convention committees. Bul. 536, pp. 15, 323-326.
 — Standing committees. Bul. 536, pp. 5, 324, 327-328.
 — (*See also* committees under specific subjects.)
 Constitution, amendments to. Bul. 536, pp. 5, 13-15, 324.
 — Draft of. Bul. 536, pp. 329-330.
 Conventions. Papers, reading of. Bul. 536, p. 193.
 — Persons attending. Bul. 536, pp. 331-335.
 — Program, copy of. Bul. 536, pp. III-VII.
 — Time and place of holding. Bul. 536, pp. II, 5, 6, 246, 326.
 Legislative activity. Bul. 536, pp. 244-246.
 Membership, list of. Bul. 536, pp. 16-17.
 Officers. Bul. 536, pp. II, 5, 246, 326.
 Proceedings, seventeenth annual convention, Wilmington, Delaware, Sept. 22-26, 1930. Bul. 536.
 Resolutions. Bul. 536, pp. 246, 323-324.
 Secretary-treasurer, report of. Bul. 536, pp. 15-22.
 Interstate commerce, definition. Bul. 536, p. 42.
 Interstate and intrastate cases (Wilcox). Bul. 536, pp. 42-49, 58-59.
 Intrastate commerce, definition. Bul. 536, p. 42.
 Insurance carriers. (*See* Mutual insurance companies; Private insurance companies; Rates; Self-insurers.)
 Investigation of results of compensation awards, committee on. Bul. 536, p. 30.
 International medical congress on industrial accidents and occupational diseases. Bul. 536, pp. 17-18.

J

- Jurisdictional conflict. Maritime law and compensation cases, border line (Laughlin). Bul. 536, pp. 49-58, 86.
 Justice, definition of. Bul. 536, p. 2.

L

- Laws. (*See* Legislation.)
 Lawyers, training in workmen's compensation law. Bul. 536, pp. 31-32.
 Lead poisoning. Spray painting (Smyth). Bul. 536, pp. 316-322, 35.
 Legislation, workmen's compensation:
 Changes in. Bul. 536, pp. 10-11.
 Effect upon society. Bul. 536, p. 1.
 Extraterritoriality. Bul. 536, pp. 2-3, 324.
 I. A. I. A. B. C., committee on. Bul. 536, pp. 6, 324, 328.
 — Legislative activity of. Bul. 536, pp. 244-246.
 Latin American Republics. Bul. 536, pp. 15-16.
 Power to compel testimony. Bul. 536, pp. 65-66.
 Purpose, nature and character (Duxbury). Bul. 536, pp. 121-138, 255.
 Review of, 1930. Bul. 536, pp. 10-11.
 States and Territories—
 District of Columbia. Bul. 536, pp. 100-106.
 Porto Rico. Bul. 536, pp. 235-244.
 United States. Bul. 536, p. 83.
 Suggested changes in. Bul. 536, p. 324.
 Test of success of (Stack). Bul. 536, pp. 1-13.
 Third-party liability. Bul. 536, p. 324.
 Uniformity. Bul. 536, pp. 3, 324.
 Lighting, industrial:
 Accidents. Bul. 536, pp. 154-155.
 Fatigue. Bul. 536, pp. 154-155.
 Longshoremen's and harbor workers' act, administration. Bul. 536, pp. 56, 84-89.
 Loss of use, percentage of. Bul. 536, pp. 35-36.
 Lumbar puncture. Bul. 536, pp. 286-288, 289.
 Lump-sum settlements. Bul. 536, pp. 132, 289-290, 292.

M

- Maritime law and compensation cases, border line (Laughlin). Bul. 536, pp. 49-58, 86.
 Mechanical safeguards. Bul. 536, pp. 140-141, 150, 154, 162, 165, 167, 168, 204.
 Mechanization of coal mining (Harrington). Bul. 536, pp. 183-192.

- Medical advice. Bul. 536, pp. 105-106.
 (*See also* Power to compel testimony.)
- Medical colleges and universities. (*See* Schools and colleges.)
- Medical committee, I. A. I. A. B. C.
 Membership. Bul. 536, pp. 41, 327.
 Report. Bul. 536, pp. 22-41.
- Medical examinations. Bul. 536, pp. 266, 313, 314, 315-316.
- Medical fees. Bul. 536, pp. 74, 105.
- Medical science as applied to workmen's compensation and occupational diseases,
 international congress on. Bul. 536, pp. 17-18.
- Medical service:
 Cost. Bul. 536, pp. 173, 238.
 Porto Rico. Bul. 536, pp. 237, 238.
- Medicine, industrial:
 Bibliography. Bul. 536, pp. 25-27.
 Study of. (*See* Schools and colleges.)
- Mental conditions:
 Epilepsy. Bul. 536, p. 284.
 Insanity. Bul. 536, p. 284.
 Psychiatry and industry (Robbins). Bul. 536, pp. 274-280.
- Mining, coal. Mechanization and accidents (Harrington). Bul. 536, pp. 183-192.
- Minors, hazardous employment of. Bul. 536, p. 265.
- Mutual insurance companies, rates. Bul. 536, pp. 119-120.

N

- National Safety Council:
 Accident prevention work. Bul. 536, pp. 163, 169.
 Representation at meetings of. Bul. 536, pp. 9, 324.
- Neck, injuries to. Bul. 536, p. 11.
- Nervous conditions:
 Hysteroneurasthenia. Bul. 536, p. 284.
 Shell shock. Bul. 536, p. 292.
 Psychiatry and industry (Robbins). Bul. 536, pp. 274-280.
- Noninsured employers. Bul. 536, pp. 134, 239-240.

O

- Occupational diseases:
 Books on. Bul. 536, pp. 25-27.
 Coverage, cost of. Bul. 536, pp. 33-34, 336-342.
 Diagnosis of. Bul. 536, pp. 37, 38-39, 290-291, 293.
 International conference of medical science as applied to. Bul. 536, pp. 17-18.
 Massachusetts investigation of, 1929. Bul. 536, pp. 148-150.
 Prevention of. Bul. 536, pp. 145, 146, 157-158.
 Reporting of. Bul. 536, pp. 148-149.

P

- Permanent disabilities:
 French system of compensation for. Bul. 536, pp. 6, 324.
 Percentage of loss of use. Bul. 536, pp. 35-36.
 Porto Rico. Bul. 536, p. 237.
 Standard schedule. Bul. 536, pp. 125-127, 134-138.
- Physical examinations. (*See* Medical examinations.)
- Physicians:
 Competency of. Bul. 536, pp. 30, 31, 32, 34-35, 37, 38-39, 293, 315.
 Fees. Bul. 536, pp. 71, 74, 105.
 (*See also* Schools and colleges, industrial medical course in.)
- Pneumoconiosis. Bul. 536, pp. 38-39.
- Poisoning, industrial:
 Massachusetts. Bul. 536, p. 146.
 (*See also* Occupational diseases, and specific diseases.)
- Porto Rico, workmen's compensation in (Martinez). Bul. 536, pp. 235-246.
- Preemployment examinations. (*See* Medical examinations.)
- Preexisting conditions.
 Handicapped, employment of (Bancroft). Bul. 536, pp. 262-272.
 — (Fedley). Bul. 536, pp. 249-262.
 Heart disease, employment (Allen). Bul. 536, pp. 254, 307-316.
 Wenzel resolution. Bul. 536, pp. 127-129.

Premiums:

- Accident reports and insurance rates (Kelly). Bul. 536, pp. 106-121.
- State experience in controlling (Evans). Bul. 536, pp. 89, 230-235.
- Structural-steel workers. Bul. 536, pp. 110-111, 113-115, 117.
- Window cleaners. Bul. 536, p. 113.

President's address (Stack). Bul. 536, pp. 1-13.

- Committee on, appointment and report. Bul. 536, pp. 13-14, 324.

Private insurance companies:

- Abuse of law. Bul. 536, pp. 3-4.
- Accident prevention work. Bul. 536, p. 167.
- Camouflaging limitations of coverage. Bul. 536, p. 4.
- Cooperation. Bul. 536, pp. 87, 105.
- Honesty. Bul. 536, pp. 117, 119.
- (See also Rates.)

Psychiatry and industry (Robbins). Bul. 536, pp. 274-280.**R****Railroad workers:**

- Attitude toward workmen's compensation. Bul. 536, p. 48.
- Status of. Bul. 536, p. 42.

Rates:

- Accident reports and insurance rates (Kelly). Bul. 536, pp. 106-121.
- State experience in controlling (Evans). Bul. 536, pp. 230-235, 89.
- Refrigerating gas. Bul. 536, pp. 306, 307.
- Rehabilitation (Hutchins). Bul. 536, pp. 272-274, 138.
- Committee on. Bul. 536, pp. 5, 324, 328.
- Special fund, District of Columbia. Bul. 536, pp. 102-103.
- Remarriage table, American. Bul. 536, pp. 15, 17.
- Resolutions, I. A. I. A. B. C. Bul. 536, pp. 246, 323-324.
- Results of compensation awards, committee on. Bul. 536, p. 30.

S**Safety codes. Bul. 536, pp. 17, 142-143, 153-154, 156, 157, 168.****Safety committee, I. A. I. A. B. C. Bul. 536, p. 328.****Safety devices. (See Mechanical safeguards; Willful misconduct.)****Safety education. (See Accident prevention, education.)****Schools and colleges:**

- Accident prevention course. Bul. 536, pp. 165, 169.
- Industrial medical course in. Bul. 536, pp. 6-7, 22-41.
- Support of. Bul. 536, p. 41.

Seamen. (See Maritime workers.)**Second injuries:**

- Employment of handicapped (Bancroft). Bul. 536, pp. 262-272.
- (Pedley). Bul. 536, pp. 249-262.
- Heart disease, employment (Allen). Bul. 536, pp. 307-316, 254.
- Special fund. Bul. 536, pp. 102-103, 251, 254-255, 258, 262, 266.

Self-insurers:

- Cooperation of. Bul. 536, p. 87.
- Employment of handicapped. Bul. 536, pp. 269, 271-272.

Shell shock. Bul. 536, p. 292.**Silicosis. Bul. 536, pp. 38-39, 146.****Skull injuries. (See Head injuries.)****Small plants, accident prevention. Bul. 536, pp. 143-144, 152-153, 163, 167.****Spray painting, health hazards (Smryth). Bul. 536, pp. 316-322, 35.****Standard plan of accident statistics, revision of (Hatch). Bul. 536, pp. 247-248.****Statistics and compensation insurance cost, committee on:**

- Membership. Bul. 536, p. 327.
- Report of (Hatch). Bul. 536, pp. 247-248.

Structural-steel work, premium rates. Bul. 536, pp. 109-111, 113-116, 117.**Surgery, industrial. Bul. 536, pp. 34, 36, 37-38.****Syphilis. Bul. 536, p. 314.****T****Termination of rights. Bul. 536, p. 88.****Testimony, power to compel (Allen). Bul. 536, pp. 60-74, 111-112.****Third-party cases (Klaw). Bul. 536, pp. 75-83, 102, 104, 324-326.****Traumatic surgery. (See Industrial surgery.)**

U

- United States Chemical Warfare Service (Gilchrist). Bul. 536, pp. 293-307.
United States Employees' Compensation Commission:
 District of Columbia compensation law (Hoage). Bul. 536, pp. 100-106.
 Problems of (Warwick). Bul. 536, pp. 83-91.
United States Women's Bureau. Report on industrial accidents to women. Bul. 536, pp. 9-10.

V

- Voluntary agreements. (*See* Direct settlements.)

W

- Wages, Porto Rico. Bul. 536, pp. 242-243.
Waiting period:
 Porto Rico. Bul. 536, p. 238.
 Utah. Bul. 536, p. 228.
 Virginia. Bul. 536, p. 11.
Waiver of rights. Bul. 536, pp. 251-252, 255-262, 270, 271.
War casualties. Bul. 536, pp. 301-303.
War chemicals, effects of (Gilchrist). Bul. 536, pp. 293-307.
Weekly maximum:
 District of Columbia. Bul. 536, p. 102.
 Porto Rico. Bul. 536, p. 238.
 Virginia. Bul. 536, p. 11.
Widows, remarriage of. (*See* American remarriage table.)
Willful misconduct cases (Roblin). Bul. 536, pp. 91-100, 112.
Window cleaners, premium rate. Bul. 536, p. 113.
Women, industrial accidents to. Bul. 536, pp. 9-10.
Workmen's compensation:
 All American conference on. Bul. 536, pp. 16, 323.
 Cost. Bul. 536, pp. 172-173, 192-193.
 Purpose, nature and character of laws (Duxbury). Bul. 536, pp. 121-138, 255.
 (*See also* Costs.)

Name Index

A

- Allen, Matt H. (North Carolina). Power to compel testimony. Bul. 536, pp. 60-65, 67, 70, 74.
Allen, Dr. Olin S. (Delaware). Heart disease. Bul. 536, pp. 307-312.
Altmeyer, A. J. (Wisconsin). Permanent disabilities, standard schedule. Bul. 536, pp. 134-135, 136, 137, 138.
Armstrong, Fred W. (Nova Scotia). Committee on President's address. Bul. 536, pp. 14, 324.

B

- Baker, G. Clay (Kansas):
Interstate workers. Bul. 536, p. 59.
Power to compel testimony. Bul. 536, pp. 68-69
Bancroft, Joseph (Delaware). Handicapped, employment of. Bul. 536, pp. 262-265.

C

- Cole, W. Graham (New York). Handling-material accidents. Bul. 536, pp. 194-199.
Crowder, Dr. Thomas R. (Illinois). Handicapped, employment of. Bul. 536, pp. 252-254.

D

- Deans, Parke P. (Virginia):
Accident statistics. Bul. 536, pp. 226-227, 234.
Committee on President's address. Bul. 536, pp. 13, 14.
Third-party liability. Bul. 536, pp. 325-326.
Duxbury, F. A. (Minnesota):
Committee on President's address. Bul. 536, pp. 13, 14, 324.
Handicapped, employment of. Bul. 536, p. 269.
Horseplay. Bul. 536, pp. 99-100.
Loss of use, percentage of. Bul. 536, pp. 35-36.
Medical examinations. Bul. 536, pp. 315-316.
Purpose, nature and character of workmen's compensation laws. Bul. 536, pp. 121-132, 135, 136, 137, 138.
Railroad workers. Bul. 536, p. 49.
Rates. Bul. 536, pp. 114, 115.
Willful misconduct. Bul. 536, p. 99.

E

- Evans, Frank P. (Virginia). Premiums, control of. Bul. 536, pp. 230-233.

F

- Fell, O. T. (Ohio). Handicapped, employment of. Bul. 536, pp. 265-267.
French, Will J. (California). Foremen, key men. Bul. 536, pp. 212-215.

G

- Garcelon, Donald D. (Maine). Maritime workers—border line. Bul. 536, pp. 56-58.
Gehrmann, Dr. G. H. (Delaware). Industrial medicine course. Bul. 536, pp. 22-27, 30.
Gernon, James L. (New York). Factory inspection. Bul. 536, pp. 158-161.
Gilchrist, Maj. Gen. H. L. (District of Columbia). Chemical cases, effects of. Bul. 536, pp. 293-306, 307.
Grant, Dr. Francis C. (Pennsylvania). Skull fractures. Bul. 536, pp. 286-288.

H

- Halford, Henry J. (Ontario):
Power to compel testimony. Bul. 536, pp. 71-72.
Second-injury fund. Bul. 536, pp. 259, 260.
Willful misconduct. Bul. 536, p. 100.

- Harrington, Daniel (District of Columbia). Mechanization of coal mining, effect on accidents. Bul. 536, pp. 183-192.
- Hatch, L. W. (New York) :
- Cost of workmen's compensation. Bul. 536, p. 193.
 - Cost of industrial accidents. Bul. 536, pp. 181-183.
 - Second-injury fund. Bul. 536, pp. 258-259, 259-260.
 - Standard plan for accident statistics. Bul. 536, pp. 247-248.
 - Waiver of rights. Bul. 536, pp. 258-259, 261.
- Heinrich, H. W. (Connecticut.) Cost of industrial accidents. Bul. 536, pp. 171-179.
- Hoage, Robert J. (District of Columbia) :
- District of Columbia compensation law. Bul. 536, pp. 100-106.
 - Power to compel testimony. Bul. 536, pp. 69-70.
- Huber, I. K. (Oklahoma) :
- Handicapped, employment of. Bul. 536, pp. 267-269.
 - Interstate workers. Bul. 536, p. 58.
 - Self insurance. Bul. 536, pp. 271-272.
- Hutchins, Dr. G. B. (New York). Rehabilitation. Bul. 536, pp. 272-274.

J

- Jones, Robert K. (Delaware). Industrial surgery. Bul. 536, p. 36.

K

- Kearns, Thomas P. (Ohio) :
- Accident statistics. Bul. 536, p. 230.
 - Cleveland Clinic disaster. Bul. 536, p. 322.
 - Safety education. Bul. 536, pp. 161-167.
- Kelly, Gregory C. (Pennsylvania). Rates. Bul. 536, pp. 106-109, 113.
- Keown, R. McA. (Wisconsin). Safety education. Bul. 536, pp. 167-169.
- Kessel, Dr. Russel (West Virginia). Skull fractures. Bul. 536, p. 289.
- Kiler, William H. (Delaware). Handling-material accidents. Bul. 536, pp. 206-207.
- Klaw, Abel (Delaware). Third-party cases. Bul. 536, pp. 75-82.

L

- Laughlin, Sam (Oregon). Maritime law and compensation cases, border line. Bul. 536, pp. 49-55.
- Lawrence, A. R. (New Jersey). Accident statistics. Bul. 536, pp. 215-219.
- Leonard, Wellington T. (Ohio) :
- Third-party cases. Bul. 536, p. 83.
 - Willful misconduct. Bul. 536, p. 95.
- Locke, Jerome G. (New York). Maritime law and compensation cases, border line. Bul. 536, pp. 55-56.

M

- McColl, Henry (Minnesota). Rates. Bul. 536, p. 118.
- McShane, O. F. (Utah) :
- Accident statistics. Bul. 536, pp. 228, 230.
 - Committee on president's address. Bul. 536, p. 324.
 - Medical schools. Bul. 536, p. 40.
 - Occupational diseases. Bul. 536, pp. 33-34.
 - Porto Rico, assistance to. Bul. 536, pp. 244, 245, 246.
 - Power to compel testimony. Bul. 536, pp. 65-67, 72.
 - Rates. Bul. 536, p. 115.
 - Third-party cases. Bul. 536, p. 82.
 - Waiver of rights. Bul. 536, pp. 257-258, 262.
- Magnusson, Leifur (District of Columbia) :
- Rates. Bul. 536, pp. 117-118, 120.
 - Reading of papers. Bul. 536, p. 193.
- Maguire, William J. (Pennsylvania). Accident statistics. Bul. 536, pp. 219-225, 227-228.
- Martinez, P. Rivera (Porto Rico). Workmen's compensation in Porto Rico. Bul. 536, pp. 235-245.
- Meade, John P. (Massachusetts). Factory inspection. Bul. 536, pp. 139-151.
- Moorhead, Dr. John J. (New York). Fractured skulls. Bul. 536, pp. 281-286, 291-293.
- Morley, R. B. (Ontario). Medical diagnosis. Bul. 536, p. 39.
- Myers, H. B. (Illinois). Accident statistics. Bul. 536, pp. 229-230.

O

O'Connor, Frank J. (New Jersey). The foreman, the key man. Bul. 536, pp. 208-211.

P

Parks, Joseph A. (Massachusetts):

- Discussion of papers. Bul. 536, p. 193.
- Industrial medicine, study of. Bul. 536, pp. 30-32.
- Industrial surgery. Bul. 536, pp. 38-39.
- Power to compel testimony. Bul. 536, pp. 73-74.
- Skull fractures. Bul. 536, pp. 290-291.
- Third-party cases. Bul. 536, pp. 324-325.
- Waiver of rights. Bul. 536, pp. 256-257, 259.

Patton, Eugene B. (New York):

- Accident statistics. Bul. 536, pp. 234-235.
- Preexisting condition. Bul. 536, pp. 270-271.
- Rates. Bul. 536, pp. 116-117, 120, 121.

Pedley, Dr. Frank G. (Quebec). Handicapped and workmen's compensation. Bul. 536, pp. 249-252, 261, 262.

Perkins, Frances (New York):

- Second injuries. Bul. 536, pp. 254-255, 260.
- Waiver of rights. Bul. 536, pp. 255-256, 261.

Plumstead, Joseph E. (Delaware). Cost of industrial accidents. Bul. 536, pp. 180-181.

Price, Dr. Richard H. (Delaware). Psychiatry and industry. Bul. 536, pp. 277-279.

R

Roach, John (New Jersey):

- Accident prevention. Bul. 536, p. 192.
- Porto Rico, assistance to. Bul. 536, pp. 245-246.

Robbins, Dr. Frederick C. (Maryland):

- Psychiatry and industry. Bul. 536, pp. 274-277, 279-280.
- Skull fractures. Bul. 536, p. 290.

Roblin, Mrs. F. L. (Oklahoma). Willful misconduct. Bul. 536, pp. 91-95.

Rosseland, Fred M. (New Jersey). Safety education. Bul. 536, pp. 169-171.

S

Senft, C. M. (New Jersey). Handling-material accidents. Bul. 536, pp. 199-206.

Smith, Walter Dent (Delaware). Foremen, key men. Bul. 536, pp. 211-212.

Smyth, Dr. Henry Field (Pennsylvania):

- Industrial medicine, study of. Bul. 536, pp. 27-29, 34-35, 40, 41.
- Spray coating. Bul. 536, pp. 316-322.

Spackman, Dr. James G. (Delaware). Skull fractures. Bul. 536, pp. 288-289.

Stack, Dr. Walter O. (Delaware):

- Industrial medicine, study of. Bul. 536, pp. 34, 40, 41.
- President's address. Bul. 536, pp. 1-13.

Stanley, Hal M. (Georgia):

- Accident statistics. Bul. 536, p. 234.
- Committee on president's address. Bul. 536, p. 324.
- Power to compel testimony. Bul. 536, pp. 111-112.
- Rate making. Bul. 536, p. 112.
- Willful misconduct. Bul. 536, p. 112.

Stewart, Ethelbert (District of Columbia):

- Committee on president's address. Bul. 536, p. 324.
- Cost of workmen's compensation. Bul. 536, p. 192.
- Industrial medicine, study of. Bul. 536, pp. 30, 32-33, 39, 41.
- Lump-sum settlements. Bul. 536, pp. 289-290.
- Power to compel testimony. Bul. 536, pp. 72, 74.
- Rates. Bul. 536, pp. 109-111, 113, 114, 115, 117, 118.
- Secretary-treasurer, report of. Bul. 536, pp. 15-22.
- Spray painting. Bul. 536, p. 322.
- Waiver of rights. Bul. 536, p. 271.

Stutsman, W. H. (North Dakota):

- Cost of industrial accidents. Bul. 536, p. 193.
- Power to compel testimony. Bul. 536, p. 68.

W

- Warwick, Walter W.** (District of Columbia). Problems of United States Employees' Compensation Commission. Bul. 536, pp. 83-91.
- Watson, Dr. C. H.** (New York). Heart disease and employment. Bul. 536, pp. 312-315.
- Weeks, Charles H.** (New Jersey). Factory inspection. Bul. 536, pp. 151-158.
- Wilcox, Fred M.** (Wisconsin):
- Committee on president's address. Bul. 536, p. 324.
 - Industrial medicine, study of. Bul. 536, pp. 36-38, 41.
 - Interstate and intrastate cases. Bul. 536, pp. 42-49, 58-59.
 - Occupational disease coverage. Bul. 536, pp. 336-342.
 - Porto Rico, assistance to. Bul. 536, p. 246.
 - Power to compel testimony. Bul. 536, pp. 70-71, 72-73.
 - Rates. Bul. 536, pp. 118-119, 120-121.
- Williams, F. M.** (Connecticut):
- Committee on president's address. Bul. 536, p. 324.
 - Waiver of rights. Bul. 536, pp. 260-261.
- Willoughby, H. H.** (Illinois). Nature and purpose of compensation laws. Bul. 536, pp. 132-134.
- Worstell, Lawrence E.** (Idaho). Willful misconduct. Bul. 536, pp. 95-99.