

1934 Convention of the International Association
of Industrial Accident Boards and Commis-
sions, Boston, Massachusetts

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Discussion of Industrial Accidents and Diseases



Bulletin No. 2

UNITED STATES DEPARTMENT OF LABOR
DIVISION OF LABOR STANDARDS

UNITED STATES DEPARTMENT OF LABOR

FRANCES PERKINS, Secretary

DIVISION OF LABOR STANDARDS

VERNE A. ZIMMER, Director

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ANNUAL MEETINGS 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.
	Jan. 12, 13, 1915 (1).....	Chicago, Ill.....	do.....	Do.
2	Sept. 30-Oct. 2, 1915.....	Seattle, Wash.....	do.....	Do.
3	Apr. 25-28, 1916.....	Columbus, Ohio.....	Floyd L. Daggett.....	} L. A. Tarrell.
4	Aug. 21-25, 1917.....	Boston, Mass.....	Wallace D. Yaple.....	
5	Sept. 24-27, 1918.....	Madison, Wis.....	Dudley M. Holman.....	Royal Meeker.
6	Sept. 23-26, 1919.....	Toronto, Ontario.....	F. M. Wilcox.....	Do.
7	Sept. 20-24, 1920.....	San Francisco, Calif.....	George A. Kingston.....	Do.
8	Sept. 19-23, 1921.....	Chicago, Ill.....	Will J. French.....	Charles H. Verrill..
9	Oct. 9-13, 1922.....	Baltimore, Md.....	Charles S. Andrus.....	Ethelbert Stewart..
10	Sept. 24-26, 1923.....	St. Paul, Minn.....	Robert E. Lee.....	Do.
11	Aug. 26-28, 1924.....	Halifax, Nova Scotia.....	F. A. Duxbury.....	Do.
12	Aug. 17-20, 1925.....	Salt Lake City, Utah.....	Fred W. Armstrong.....	Do.
13	Sept. 14-17, 1926.....	Hartford, Conn.....	O. F. McShane.....	Do.
14	Sept. 27-29, 1927.....	Atlanta, Ga.....	F. M. Williams.....	Do.
15	Sept. 11-14, 1928.....	Paterson, N. J.....	H. M. Stanley.....	Do.
16	Oct. 8-11, 1929.....	Buffalo, N. Y.....	Andrew F. McBride.....	Do.
17	Sept. 22-26, 1930.....	Wilmington, Del.....	Frances Perkins.....	Do.
18	Oct. 5-8, 1931.....	Richmond, Va.....	Dr. Walter O. Stack.....	Do.
19	Sept. 28-29, 1932.....	Columbus, Ohio.....	Parke P. Deans.....	Do.
20	Sept. 11-14, 1933.....	Chicago, Ill.....	Wallington T. Leonard.....	Do.
21	Sept. 24-28, 1934.....	Boston, Mass.....	R. E. Wenzel.....	Charles E. Baldwin.
			Joseph A. Parks.....	Do.

¹ Special meeting.

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Proceedings of the 1934 Convention of the International Association of Industrial Accident Boards and Commissions, Boston, Mass.

Monday, September 24—Morning Session

Chairman, JOSEPH A. PARKS, President I. A. I. A. B. C.

The twenty-first annual convention of the International Association of Industrial Accident Boards and Commissions convened at the Statler Hotel, Boston, Mass., September 24, 1934, Mr. Joseph A. Parks, chairman of the Department of Industrial Accidents of Massachusetts, president of the association, presiding.

[President Parks introduced Mr. John F. Doherty, city collector, who, on behalf of the mayor, presented the greetings of the city of Boston and spoke briefly on the humanitarian aspects of the workmen's compensation act. The president, after welcoming the delegates, presented his report.]

PRESIDENT'S ADDRESS

*By JOSEPH A. PARKS, Chairman Department of Industrial Accidents of
Massachusetts and President I. A. I. A. B. C.*

After nearly 23 years of workmen's compensation acts in these United States, I believe that this may be an opportune time to take stock, so to speak, and to find out whether we are going ahead or whether we are slipping back. This occasion carries me back to the time when we had no compensation laws in the United States. In fact, my mind goes back farther than that, to when I was a little chap 11 years of age, working in a cotton mill in England. I remember being in the mill yard, and peering through the window of the office of the mill I saw a man sitting on a stool. His hand was hanging off—there was only a piece of skin holding it in place. He was receiving no medical attention whatever. I inquired, in my boyish way, why something was not done for him, and was informed that a wagon would come for him soon and take him to the infirmary. I asked why there wasn't some way of helping him in the mill, and was told the mill did not have anything of a surgical character. By and by, a wagon came and the man was bundled off to the hospital. I was informed later that nothing would be done by the mill in the matter; that there were plenty more to take the man's place. That made a profound impression on my mind, one I have never been able to eradicate.

Like a good many other ambitious youths, I came from the old country and, landing in the mill city of Fall River, immediately started to work in the cotton mill there. A few years later, I was fortunate enough to be elected to the Massachusetts Legislature, beginning my legislative career in 1904. In 1905 I introduced a workmen's compensation act. In 1910 a commission was appointed, of which I was a member, and at that time the Massachusetts Workmen's Compensation Act was born. It was enacted into law in 1911 and went into effect in 1912. Although there is some controversy as to which State passed the first workmen's compensation act which would stand the test of law, I believe Massachusetts was one of the first. Since that time I have served on the Industrial Accident Board of Massachusetts and am now its chairman.

You who comprise the membership of the boards and commissions of the United States, the Provinces of Canada, and Puerto Rico, have reason to be proud of the wonderful record and accomplishments of the past 22 years. Although the passage of workmen's compensation acts and their administration have brought many perplexing problems, which later I shall touch upon, these problems were inevitable, even if they were unforeseen, and it will be our duty to attempt to solve any new problems, to the end that the workmen's compensation act will not prove to be a detriment to the injured men and women whom it was intended to benefit. First, I think we have a right to point with pride to some of the good which has resulted from the passage of workmen's compensation acts. I refer particularly to the medical feature of the act. Not knowing just how the medical feature works out in the various States—knowing only what I read in the reports and what I hear at the conventions—I can speak only of Massachusetts. I recall vividly my early days in the mills of Massachusetts, when even pure drinking water was denied the workers. Water, brought in a bucket, was put in a corner of the room where lint and cotton would gather on top of it and you had to blow them off; but that is a thing of the past. Today, when we go through a mill, we see a cool bubbler which is always at hand for the workers. The greatest change of all in mill management, however, is in the treatment of injuries sustained while at work. I have a vivid recollection of the numerous serious injuries which I saw during my years in the mill. I recall being struck in the eye by a flying shuttle. With the blood trickling down my face, I held my hand on my eye for over a half hour, thinking my eye was in my hand, but I kept on working with the other hand. No medical attention was given me. At another time a heavy weight crushed my toe. There were numerous things happening every day, but there was not even a piece of sticking plaster in the mill, or a little liquid refreshment in case an employee fainted. There was no thought of sending for a doctor. The employee had to struggle along until the end of the day and then go home and get whatever attention he could. No one seemed to care. A human life seemed to be very cheap. If one did receive a serious injury in the course of his employment he had to sue his employer, and what an arduous task that was. We all know the story of the years of waiting before the verdict, meager as it was many times, and then the division between the legal counsel and the injured workman.

What has the workmen's compensation act done? We are all familiar—perhaps I am more than most of you here are—with the principle upon which the workmen's compensation acts were based—that the cost of industrial injuries must be borne by industry and then in turn passed on to the consumer. The happy result of that principle being enacted into law has been that the employer soon found that it was good business to safeguard the workman and to prevent him from being injured, if possible. Wonderful strides have been and are being made in this respect, and you are going to hear a good deal about that phase of the law on Thursday at the joint session of our association and the International Association of Governmental Labor Officials, the members of which have the administration of all the labor laws. In place of neglect of the injured workman when he receives an injury, there is tender solicitude by the employer, who wants to do all he can for the man, because neglect of him may cost the employer money. So in this Commonwealth we have the employers providing hospitals and first-aid rooms, with doctors and nurses in continuous attendance. Employees are continually urged to report their injuries and to go to the first-aid rooms and have their wounds dressed and get proper medical attention. The insurance companies have established great clinics, where they have staffs of experienced surgeons and every facility for bringing about the recovery of injured men. In a serious case the man is promptly removed to the hospital and given the best care our great hospitals can give.

Throughout the course of the injured man's disability the doctors watch over him to see that he has no set-back. If he needs an expert, one is secured. In our Commonwealth, if the employee does not care to accept this treatment he may choose his own physician. The only limit to payment of medical bills is the discretion vested in the board. May I say, in passing, that it is my belief that it is bad business to have any limit. There should be no limit to medical attention. It is false economy to give a man medical care for 2 weeks, a month, 6 months, or a year, and then turn him adrift because, perchance, you have a limit to what you can do in medical cases. I recall \$14,000 being spent in this Commonwealth on one individual for medical and hospital bills.

One of the recommendations I want to make is that this convention recommend to the various States which have a limit on medical attention that a uniform law be enacted that full medical attention be given all injured workmen.

As with all legislation which is designed to benefit the worker, however, someone, after a while, begins to study how to take advantage of it. In the early days of the administration of this act, our supreme court was called upon to interpret it; it rendered a number of decisions, and, to its credit, interpreted the act liberally. In one of the earlier decisions, *Madden's case*, 227 Mass. 487, that court enunciated the principle of law that you have to take an injured workman "as is." In *Brightman's case*, 220 Mass. 17, the court stated that "acceleration of a preexisting heart disease to a mortal end sooner than it otherwise would have come is an injury within the meaning of the act." *Johnson's case*, 217 Mass. 388, was a lead-poisoning case.

Of late years, in this Commonwealth and I presume in other States with which you are familiar, employers are adopting the idea of physical examinations and weeding out, so to speak, physical defectives. In some of these so-called "physical examinations" the workmen are often done a serious injustice. The plant doctor in such cases is generally judge and jury as to a man's fitness to continue in employment. The condition he finds may not be nearly so serious as he reports. In a particular instance I have in mind, as a result of such examinations, as many as 42 men in a given industry were discharged as being sufferers from silicosis. After they had been out of work several months I had the pleasure of serving on a committee through whose good offices these men were reinstated in their employment. They have been back at work now over a year, and not one of them has lost a day's work since. Yet this doctor, by his so-called "physical examination", condemned them as being unfit to be employed. I dislike to refer to this because this matter was happily ended; I refer to it only to show that in such physical examinations by the plant doctor the rendering of a verdict that a man is unfit to be employed is a serious injustice and a sad commentary on the fairness of employers of labor in treating with their employees. When the doctor renders a verdict that a man is unfit to be employed, such doctor turns that man onto the cold charity of the world, because no one else will employ him.

This leads me to another subject—rehabilitation. One of the great problems of the various States is that of bringing about the rehabilitation of a man after his injury instead of having him thrown on the industrial junk heap. I know it is a common thing to criticise the rehabilitation department. In this State the rehabilitation division is under the State board of education, and the head of the division is Herbert Dallas. He is doing good work under a severe handicap. The real stumbling block, strange as it seems, to the rehabilitation of injured workmen is the employer. Without his aid and cooperation rehabilitation falls flat. It is my firm belief, after the years I have spent in this work, that industry should absorb all its injured workmen who are able to do anything at all following their injury. There is no more inhuman thing than for an employer, who is responsible for the crippling of an injured workman, to refuse to reemploy him because he has lost an eye or a finger or has been maimed in some way. Employers are beginning to examine men when they apply for work. If any physical disability whatever is found the employer refuses to employ the man even when responsible for his crippled condition.

To my mind, apart from the human aspects of this subject, it is false economy for the employer to adopt the attitude which he has in the treatment of injured workmen. It has been my experience that an injured workman, even though he has been badly crippled—has lost a hand or an eye, or has a crushed and disabled hand, or has lost a leg—if given the opportunity he can perform as good service as he ever did. I could tell you of many instances in the early days of the act, looking back 20 years, when employers did not have this foolish attitude, and when men were not discriminated against on account of their injuries. One case that comes to my mind is that of a structural-iron worker in Boston whose back was broken by a long fall, and to whom the insurer furnished adequate medical attention, a successful

operation bringing about the man's partial recovery. He was given work by his employer and proved so efficient after his return that he was promoted by various stages from foreman to superintendent, and he is happily employed today, so far as I know. The insurer in that case, and incidentally the employer, saved by his rehabilitation, which was brought about mainly by the cooperation of his employer in giving him employment, at least \$2,500, figuring the cost of the medical attention plus the compensation paid him when he was out. Incidentally, the man is of economic value to the community. With the present short-sighted policy, that same man would not be given work because of his defective back. He would be paid the full limit of compensation because of his inability to get work which he could do, and at the end of the compensation period, which is limited in Massachusetts, he and his family would have become public charges. This particular man had a wife and four small children. Instead of their becoming public charges the father, through his employment and the increased wages which he received, was able to bring them up as good citizens without having recourse to charity.

On the subject of rehabilitation and lack of cooperation on the part of the employer, the following case is an example of the way some employers treat employees who have been injured. An injured employee had a fractured skull. He received compensation therefor and then, following a conference, returned to work. He was still having dizzy spells, still worrying over his condition, when he returned to work. The employee testified before me that his foreman watched him all the time, and at the end of 4 or 5 days wanted to send him home because he was not working as fast as he did before he was hurt. The foreman wanted him to work faster; he was that kind of an employer. That man, according to his evidence, begged for a chance to continue at work. He had a wife and four small children to support. He wanted a chance to rehabilitate himself. On the fifteenth day after his return to work, the boss, having in the meantime kept his eye on him, told him he had better go home. After sending him home he was refused compensation. The impartial doctor, a recognized neurologist, stated: "I feel that he has some capacity for sustained effort, but this must be in an occupation free from hazard and free from constant physical and mental drive. He must not be under constant pressure of activity after he has readjusted himself to that drive and pressure—if he can. He is incapacitated for doing his old work in its entirety in the manner in which he was formerly accustomed to do it. He can do and ought to do modified occupation." That opinion calls for cooperation of the employer. Without it the man will continue to be a total incapacity case, with the insurer continuing to pay compensation, perhaps for an indefinite period. This is false economy on the part of the employer. With the proper amount of sympathetic cooperation in this case, this employee would have continued at work and within a short time have been wholly rehabilitated, but again we have the short-sighted employer who cannot see beyond the end of his nose.

One of the other evils for which the compensation act is being blamed, is the discharge of men who are becoming advanced in years. This is being done in the interest of economy, and yet leading indus-

trialists who have made a study of this subject will tell you that men from 45 years of age and up are more reliable and do more and better work than young men between 20 and 40. I know from going over our accident reports from year to year that the greatest percentage of tabulatable injuries are of men between 20 and 44. The percentage of injuries lessens in the later ages. So this is another false economy step which ill-advised employers have taken. I am not saying these things in criticism of the employers. We want their cooperation. This is intended as an appeal to them to give this subject of employing crippled and old workmen more serious thought than apparently has been given to it. Of course, the human side should appeal to them, but if that does not then the economic side should, as their present system, I repeat, is false economy.

There is another recommendation I wish to make to this convention, and that is that steps should be taken to make the workmen's compensation acts all over the United States wholly compulsory and cover all employees who work for a living. Some States have such a compulsory act, but most of them are optional, like ours in Massachusetts. During the years of depression, notably the last year or so, some employers have left the act. Some of them have adopted a scheme of their own. We have no self-insurance under our act, but some of these employers have adopted a self-insurance scheme and they are outside of the act, with their common-law defenses removed in case of suit brought by the injured workmen. New schemes are continually being agitated and some employers are lending a willing ear, with the idea of saving money for themselves. Of course, this is not fair to the good employers, who are in the majority in this State, and who are willing and glad to furnish workmen's compensation insurance to their employees, and if too many employers leave the act it might become an epidemic. The only remedy for this is to bring about a compulsory act, so that no employer can escape his responsibility.

While I am on the subject of insurance, I feel I should speak on a subject which has probably touched all of your States, and that is bankruptcy of insurance companies and employers. You who are from the States where there is self-insurance as well as casualty insurance know the problem which you have met in the bankruptcy of employers who were self-insurers and unfortunately how many injured workmen have been deprived of their compensation because of said bankruptcy. Of course, you have had, by the same token, bankrupt insurance companies. Our State is an insurance State. We have no self-insurers as such under our law. Every employer who wishes to give his employees the protection of the workmen's compensation act must take out a policy of insurance in some recognized insurance company approved by the insurance commissioner. We have had in this State some insurance companies that have become defunct. Through the skillful handling of this matter by our insurance commissioner, Merton Brown, and his able assistant, Mr. Coggswell, and with the able assistance of members of the industrial accident board, injured workmen working for employers insured in these defunct companies have not yet been deprived of compensation. I put it this way because when the affairs of two of these companies are finally wound up, there is a possibility of the injured

workmen not receiving all they are entitled to under the law. We are not quite sure of that yet.

Bearing in mind that, almost without exception, in the addresses of the various presidents which I have heard, something has been said about uniformity of laws. I am afraid this is a millenium which we shall never reach. There is a great disparity of benefits in one State as compared with another, and a good many things must be considered before you bring about uniform benefits. After all, that is a question for the legislatures of the various States and not a function of these boards as such. It is our job to administer the laws as enacted by our various legislatures.

I do feel, however, that we might have some common understanding on procedure, because I find, in meeting my friends from other States, that they want to know how we handle the settlement of cases. They ask various questions, such as, "How do you handle your medical and hospital problems?" These, while perplexing things in some States, are comparatively simple in others, and I think we could well pass along to each other our methods of handling these various perplexing matters. We could even go so far as to recommend a uniform mode of procedure.

Speaking of procedure I cannot refrain from expressing my great satisfaction, as I look over the years, at the great success of the procedure which was adopted in the early days in administering workmen's compensation acts. One of the difficulties in bringing about the enactment of the law in the first instance was the problem of whether the existing courts, or lay boards, so called, were to administer the acts. Organized labor at the time was very solicitous of the right of trial by jury, but because of the benefits it could see coming to it through the enactment of the workmen's compensation acts it gave way on that, and so we had in most States the adoption of administration by boards and commissions. As a whole, I think, it has worked out splendidly. In Massachusetts it has exceeded my fondest expectations.

In this connection, I would like to read to you an excerpt from Bulletin No. 3, dated February 1913, of the Industrial Accident Board of Massachusetts:

The industrial accident board seeks promptness in the adjustment of claims on the part of the insurance companies as a matter of efficient service. It expects, for example, in the case of fatal accidents that within 10 days the insurance company shall have reached an agreement with the dependent or dependents unless there is a question of liability. It expects of the insurance companies that when the third week of the incapacity has ended, the insurance company will be at the side of the injured employee with the compensation that he is entitled to.

Massachusetts has what is called a direct settlement act, that is, the insurance company, having received a report of an injury, gets on the job, makes the settlement, and starts compensation payments, and then the agreement comes to our board. We still insist, 21 years after the rule was made, that the rule be lived up to strictly. In a small percentage of cases which are not settled automatically, a hearing is held to determine liability.

When we have decided the benefits to which an injured workman is entitled, the principal thing is to see that he gets whatever compensation is coming to him promptly and expeditiously without too

many frills and fancies, and we have done just that. Today, after 22 years of administration, we can give an injured workman a hearing on a contested case in 4 to 6 weeks after he applies for a hearing, and in case of necessity a great deal quicker than that. That is a record of which I think we should be justly proud, especially when we consider the procedure of the courts which obliges a man who wishes a trial by jury in cases outside the workmen's compensation act, to wait from 3 to 5 years before this case can be heard, and from all reports this condition is getting worse.

In conclusion, permit me heartily to congratulate this great association on the splendid achievements of the past. Year after year, since your organization, you have made marked progress, and I hope that you will continue indefinitely to throw light on the perplexing problems that are met from year to year by compensation boards and commissions. In attending these conventions I have always been impressed by the high type, standing, and integrity of the men who have been entrusted with the work of administering the compensation laws of our country and the Provinces of Canada, and have gone away with a better knowledge and understanding of workmen's compensation procedure as a whole.

[A letter from Fred M. Wilcox, of Wisconsin, and president of the association in 1918, which was addressed to Mr. Charles E. Baldwin, secretary-treasurer of the association, was read and ordered to be inserted in the proceedings of the convention. The letter follows:]

SEPTEMBER 22, 1934.

MY DEAR DOCTOR BALDWIN:

* * * * *

That's a marvelous medical program you are to enjoy. * * * The subject, however, that attracts me most is the one on the compensation status of men engaged in works programs growing out of relief administration. If they are not under protection of the State law or the Federal act, they should be, and compensation administrators ought not waste a moment in securing it. I realize that the language used in some State laws may be the excuse for questioning, and with that I have no quarrel. The thing I protest is "attitudes"—this thinking and suggesting and arguing that somehow, somehow, the service of the men engaged in works projects, growing out of relief administration, is to be likened to involuntary service. That is not a service that one may give or refuse, but that it is a service compulsorily enforced. That it is not a service for wage, but service yielded as the occupant of an almshouse renders service—as the restrained person in a workhouse for those without means of support does service for his food and shelter—not from choice, but from compulsion, directly or indirectly imposed.

By our questioning we have built up legalistic resistance against an interpretation that would have given the protection that was normally due. We need never have descended to the level where the question could have been successfully raised. If every agency negotiating these works programs had incorporated within them the affirmative statement that every man performing service shall be deemed an employee for hire and the return for his service shall be his wage, the rough spot would have been passed, and commissions and courts would have found it easy to construe the relationship as one under compensation. But no, we have pampered the miserable notion that it was charity we were extending to these workers, and this attitude has carried on to the day when, at least for the field of compensation, it has burdened and cramped administration of laws supposedly enacted for the protection of workers.

The denial of benefits to these works employees contemplates an interpretation of their status which stops little, if any, short of a finding that theirs is "involuntary servitude." We may call it by less harsh-sounding names, but that does not change the fact. It must still rest upon a finding that they are not employees, not servants, not wage earners, not free moral agents, but

charity seekers giving impressed service as such for a bit of food and shelter. I hope the States and the Federal Government may soon settle the question and set at rest the right of such workers to the same compensation protection that other industrial workers enjoy.

I would like to see Mr. Klaw's committee develop rules and limitations for wage computation. As I read the interpretations of the various commissions and the decisions of the courts I am led to the conclusion that we are pretty much lost on fundamentals. We have yielded to the notion that the hours and days limitations for emergency purposes still represent the earning capacity of an injured man. Such construction may work comparatively no injustice to the man with temporary injuries, but it has no claim to fair treatment of the man who sustains a permanent injury. I realize that this subject provokes sharp differences of opinion, but that is the best reason for effort to develop a plan that may get uniform support.

And then again, when programs are developed and approved by the I.A.I.A.B.C., there ought to be real effort to get legislative consideration back home. Workmen's compensation is still living pretty much on its childhood reputation. From the standpoint of country-wide development it lags woefully. Legislative improvement has not kept pace with general progress. These laws at the outset were compromises. They did not measure up to the standards we are wont to profess. And they are not being brought up to those standards. The elimination of defenses in liability claims, comparative negligence schemes, the lifting of damage limitations are calculated to build up the interest of the injured in the liability method of settling personal-injury claims. Unless compensation benefits and the certainty of obtaining them offers something better than we may get through the courts we will soon find agitation for change. The wide variation in benefits from State to State is an unconscionable situation. The study which Mr. Lubin's bureau is about to undertake is bound to show our deficiencies. We should anticipate the needs for change and go about it this next legislative year.

My kindest personal wishes to you and to all the others and the hope that your meeting may be choice.

Sincerely yours,

FRED M. WILCOX.

BUSINESS MEETING

[The president appointed the following convention committees:]

Auditing committee.—E. B. Patton, of New York; R. O. Harrison, of Maryland; George T. Watson, of West Virginia; Ira M. Snouffer, of Indiana; Niels H. Debel, of Minnesota.

Nominating committee.—Fred W. Armstrong, of Nova Scotia; Donald D. Garcelon, of Maine; Stephen B. Sweeney, of Pennsylvania; Emma S. Tousant, of Massachusetts; Thomas M. Gregory, of Ohio.

Resolutions committee.—J. Dewey Dorsett, of North Carolina; Howard Keener, of Arizona; Peter J. Angsten, of Illinois; Charles F. Sharkey, of Washington, D. C.; Wellington T. Leonard, of Ohio.

[Mr. Charles E. Baldwin, secretary-treasurer of the association, read the following report:]

REPORT OF THE SECRETARY

The past year has been an active one and a crucial one in the life of our association. There have been more perplexing problems presented for consideration, probably, than during any previous year. We can feel, however, that the association is in a healthy and prosperous condition. While there have been but a few changes in the number of active member organizations, there have been numerous changes in the personnel of the various workmen's compensation commissions. Many of those who have in the past taken active part in the business of our association are not now connected with workmen's compensation administration and, if they are absent from this meeting, they will be greatly missed.

During the year two State organizations, the Industrial Accident Board of Idaho and the Industrial Commission of Minnesota, which had previously withdrawn from membership, requested reinstatement. They paid their dues and were automatically restored to membership. The Quebec Workmen's Compensation Commission of Canada formally withdrew from active membership and the Canadian National Safety League also withdrew from associate membership. The Washington Department of Labor and Industries did not resign, but did request that it be suspended for another year.

One of the individual associate members carried on our rolls for many years, I. K. Huber, representing the Empire Companies, has not been heard from for about 3 years and his name has been omitted from the list of members, and I ask your approval of that action.

The following is the list of members of the association at this time:

Active members

United States Bureau of Labor Statistics.
 United States Employees' Compensation Commission.
 Arizona Industrial Commission.
 California Department of Industrial Relations.
 Connecticut Board of Compensation Commissioners.
 Delaware Industrial Accident Board.
 Georgia Department of Industrial Relations.
 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.
 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.
 Pennsylvania Department of Labor and Industry.
 Utah Industrial Commission.
 Virginia Department of Workmen's Compensation, 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.

Associate members

American Mutual Liability Insurance Co., Boston, Mass.
 R. M. Crater, American Telephone & Telegraph Co., New York, N. Y.
 Walter F. Dodd, 33 North LaSalle Street, Chicago, Ill.
 E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.
 Arthur Gaboury, general manager Quebec Association for Prevention of Industrial Accidents, Montreal.
 Industrial Accident Prevention Associations, Toronto, Ontario.
 Leifur Magnusson, American representative, International Labor Office, Washington, D. C.
 National Council on Compensation Insurance, New York, N. Y.
 Pennsylvania Self-Insurers' Association, P. O. box 849, Harrisburg, Pa.
 Puerto Rico Industrial Commission.

In accordance with the action of this association a year ago, the members of the association were requested to pay annual dues, except those who are exempt by provision of the constitution. All active members, except eight, have paid their dues. One of these stated that it was unable to pay, 1 requested that it be considered suspended for another year, 3 stated that they would send their dues but have not as yet done so, and the other 3 have not been heard from. One associate member has not as yet paid his dues.

As stated in my report a year ago, the Paterson Mortgage & Title Guaranty Co. of New Jersey defaulted in the payment of interest on the \$1,500 certificate owned by this association. The certificate was also due and payable in October 1933. By action of the executive committee, the matter was referred to an attorney of this association, who reported that the matter was tied up owing to the bank-closing action. He reported that the property against which the certificate is issued is well secured and, while nothing can be collected on it at the present, there is a fair prospect that the association will realize on it at some future date. The following is quoted from a recent letter received from the attorney:

I inquired at the office of the Paterson Mortgage & Title Guaranty Co. the status of this mortgage certificate, and learned that they are continuing to collect the rents from the property on which the mortgage is a lien, and are applying them to the taxes. The taxes amount to between \$1,300 and \$1,400 a year, and were 2 years in arrears when they took the assignment of the rents. They have paid up the back taxes with the exception of \$340 and the first half of the current taxes on which they owe the remaining one-half, amounting to \$675. If the rent is continued as at present, I think they will be able to pay the balance of the taxes up by the first half of the year, and from that time on to begin paying about 3 percent on the investment.

The association has continued its cooperation with the American Standards Association in its work in drafting national safety codes. It has assisted in organizing the two sectional committees for the safety codes on exhaust systems and work in compressed air, both sponsored by this association. One meeting of the committees has been held during the year which was attended by our representatives, and considerable progress was made. I believe the association should continue its interest in these projects.

The proceedings of the Chicago convention have been published by the Bureau of Labor Statistics as its Bulletin No. 602, and copies will be sent from the Bureau upon request.

For myself and on behalf of the association I want to express our thanks and appreciation to the Bureau of Labor Statistics for its cooperation in printing the proceedings and for courtesies and assistance to me.

Respectfully submitted,

CHARLES E. BALDWIN,
Secretary-treasurer I. A. I. A. B. C.

[Mr. Baldwin also read the financial report of the treasurer, which was then referred to the auditing committee.]

[The report of the committee on statistics and compensation insurance cost, submitted by L. W. Hatch, the chairman of the committee, was read.]

REPORT OF COMMITTEE ON STATISTICS AND COMPENSATION INSURANCE COST

By L. W. HATCH, *Chairman*

During the last year the committee has held no meetings and taken no official action, so that there is no report of work by this committee to be made at this time. But, as in other recent years, it would seem to be in order to report

briefly the developments during the year in the work of the sectional committee of the American Standards Association, which has been endeavoring to work out a revision of the plan for accident statistics originally developed by the committee on statistics of this association. This is proper for two reasons. In the first place, this association is one of the three sponsors for this revision by the American Standards Association sectional committee, and, secondly, several members of the association's committee on statistics, including the chairman, are members of the sectional committee.

The plan for standard accident statistics which the sectional committee has been seeking to develop does not embrace all of the features in the plan originally developed by the committee on statistics of this association, but has been limited to two main subjects, these being the two which are of primary importance in the use of accident statistics as an aid to the work of accident prevention. The plan consists of two parts: Part I, dealing with accident rates, including both frequency and severity rates, and part II, dealing with analysis and classification of causes of accidents.

The principal advance in the work during the past year has been the bringing to completion by a subcommittee of a classification of accident causes to constitute part II of the plan. This classification is a very thorough and constructive piece of work and makes a document of several hundred typewritten pages. Copies of it were supplied to all of the approximately 40 members of the sectional committee and it was discussed at a meeting of that committee in May of this year, the result being endorsement of the classification in general by the sectional committee subject to editorial revision by the subcommittee after receipt of such suggestions therefor from sectional committee members as any of them might submit after further consideration, and subject also to letter ballot of the members as to its final adoption after such revision. The completion of this revision and letter ballot still remain to be accomplished.

With reference to part I, unfortunately, it must be reported that the situation is practically where it was a year ago and is one which presents some doubt whether after all it is going to be possible to secure that degree of agreement on this part of the plan as an American Standards Association project which the rules of that association require. This is due to a difference of opinion on only two points, but both are of basic importance with respect to accident rates. On both these points the division in the committee is about the same, both as to number of votes and as to members voting for the different views. Approximately two thirds of the members support one position on each of the two points and one third support another. The disagreement relates to two questions. One is whether, when an injured employee still has some disability for the work he was doing when injured, but returns to other work which he can perform, the accident shall or shall not be counted as a disabling injury. The majority hold that it should be so counted; the minority hold it should not. The other question is whether, in computing number of days of disability, 7 days or 6 days shall be counted for each week of disability. The majority are in favor of 7 days; the minority favor 6.

It would take up too much time to set forth here the arguments for and against the opposing positions on these questions and the background of differing points of view which have led to them. Such a discussion is hardly called for at this time, indeed, as it is still hoped that some way may be found to bring about more general agreement on these points. However, it cannot be denied that at this writing how this is to be done seems quite problematical. This is so because of two circumstances. For one thing, this same split in the sec-

tional committee over the same points developed over a year ago, and one of the chief purposes of the meeting last May was further to discuss them in hopes that an agreement could be reached, which was done at length but without success, so that the situation remained as before. The further discouraging circumstance is the fact that the minority votes on the disputed points are chiefly by representatives of members of the National Safety Council, and that council itself has taken up the matter and endorsed the minority position. The significance of this may be appreciated when it is recalled that the National Safety Council is one of the sponsors for the project undertaken by the sectional committee under the American Standards Association procedure. In this connection it may be noted that practically all of the representatives of the Government agencies dealing with accident statistics, such as the members of this association, on the sectional committee, have voted with the majority on the disputed points.

The above outlines the situation at this time. For this report it remains only to add that, speaking individually and not for the committee on statistics which has not considered the matter, it is suggested that no action on the matter seems to be called for at this convention of the I. A. I. A. B. C.

[Action on the report was, on motion, voted to be considered under new business.]

[Mr. Thomas P. Kearns presented the report of the committee on safety and safety codes.]

REPORT OF COMMITTEE ON SAFETY AND SAFETY CODES

By THOMAS P. KEARNS, *Chairman*

The committee on safety and safety codes desires to submit the following report:

One of the problems which rightfully command the time and attention of a body of this nature is the promulgation of uniform codes of specific safety requirements for the protection of life, limb, and health of industrial workers, and the adoption of measures designed to bring about an observance of these codes with a view to minimizing the hazards of industrial employment.

The standardization of codes along general lines is absolutely essential to successful and effective enforcement and is a goal possible of attainment if this and kindred organizations interested in the welfare and safety of workers will cooperate with the American Standards Association in the promotion and adoption of uniform codes in the various States, subject always, of course, to the deviation made necessary because of local conditions.

The American Standards Association has made splendid progress in its efforts to formulate and standardize industrial codes and is entitled to a great deal of credit for the work already accomplished and should receive wholehearted support from the various officials and organizations, State and National, who are concerned with the administration of workmen's compensation laws and enforcement of safety laws and regulations.

We are pleased to submit the following brief report of progress in safety-code activities in projects for which the International Association of Industrial Accidents Boards and Commissions is responsible:

A revision of the code for use, care, and protection of abrasive wheels is now before the sectional committee covering the guarding of coping wheels. A final draft for presentation to the committee is in course of preparation following exhaustive research work carried on under the auspices of the grinding-wheel manufacturers and National Bureau of Casualty and Surety Underwriters.

As reported at your last convention, your association has assumed sponsorship for the safety code for exhaust systems, in place of the American Society of Heating and Ventilating Engineers. The sectional committee has been reorganized; two meetings of the committee have been held. A proposed new scope has been adopted by the committee and the appointment of subcommittees authorized. The new scope of work which this committee proposes to undertake is of special importance and of interest to you at this time. This proposal covers the development of a series of standards in the field of occupational diseases, particularly in the relation of the use of exhaust systems as a means of removal of the toxic dusts, gases, and fumes causing such diseases. If this proposal is approved by the American Standards Association, it will mean the launching of a program at least as extensive as that now under way in the field of prevention of accidents, and a program with which your association and the individual members of your association will want to keep closely in touch.

No revisions are under way or contemplated at this time for codes covering mechanical power, transmission apparatus, or the codes for rubber machinery and woodworking plants.

Referring to codes or projects for which the International Association of Industrial Accident Boards and Commissions has representation on sectional committees, we wish to report as follows: A revision of the building-exit code has been prepared by the sponsor, the National Fire Protection Association, and it is expected that the revised document will be submitted to the American Standards Association for approval within the next few weeks.

To meet the needs of the Public Works Administration for a construction code, the sectional committee recommended to the American Standards Association the approval of the safety manual for construction work prepared by the Association of General Contractors of America. The American Standards Association accepted the recommendation and approved this manual as a standard pending completion of a full American standard for this industry.

The safety code for the construction, use, and care of ladders has been revised and is now being balloted on by the sectional committee with a view to submitting same to the American Standards Association for approval.

It is contemplated that a revision of the code for window washing will be made within the next year, as recent tests have proved that the present code is inadequate in that it does not furnish the proper factors of safety.

A final draft of the revised pressure piping code is now before the sectional committee for final approval and should be submitted to the American Standards Association within a very short time.

The final ballot on three standards of the industrial sanitation code, namely, sanitation for industrial establishments, drinking fountains, privies, has been approved by the sectional committee and will be submitted to the American Standards Association for approval within a few weeks.

Some progress has been made in the work of compiling and revising a number of other codes, but in view of the fact that we are attaching hereto a complete and detailed report, prepared by Mr. Cyril Ainsworth, assistant secretary of the American Standards Association, on the status of all safety codes developed or under the process of development by that association and in which this organization is interested either as sponsor or through representation on sectional committees, which we trust will be made a part of the proceedings of this convention, we do not think it advisable to burden you at this time with further details on this subject.

Safety.—At the risk of repetition we wish again to call attention to the necessity for more intensive and systematic safety effort on the part of all officials charged with the administration of compensation laws and the enforcement of safety regulations, if we are to make any material progress in reducing the number and severity of occupational injuries, with a consequent reduction in accident costs.

This need seems destined to grow as the demands of the day make for increased production and a consequent increase in working personnel to meet these demands, and we are compelled, therefore, to suggest that all too frequently safety fails to secure on our programs the time and effort that its importance warrants.

While appreciating to the fullest extent the fact that the members of this association have a very definite and necessary interest in administrative, legal, and economic problems confronting accident boards and commissions, we should not and cannot consistently overlook the importance of prevention, which is really the fundamental theory of all compensation laws. It naturally follows that officials of this organization are morally obligated to meet the conditions we have just mentioned, not only by code enactment and enforcement, but by giving greater emphasis to the problem of human engineering in the safety field. This necessitates the accentuation of safety work along educational lines to an extent compatible with the policies of your respective organization. And even though these policies contemplate no organized safety effort on the part of your respective boards, the contacts you enjoy with employers and workers should constitute a tremendous leverage for overcoming the inertia which prevents the attainment of our ultimate goal of the elimination of preventable accidents and the economic costs incident thereto.

DISCUSSION

Mr. KEARNS. Might I mention, in conclusion, that Mr. Cyril Ainsworth, the assistant secretary of the American Standards Association, is in this meeting this morning. I am submitting his report, which I hope will be printed as part of the proceedings of this convention, but he is here, and I am sure that if the organization wishes any further information on the progress that has been made generally on code work, he will be very glad to answer any questions you may care to ask.

Mr. STEWART (Washington, D. C.). I did not quite understand you. Do you mean to say that this organization is now the sole sponsor for the exhaust code?

Mr. KEARNS. That is my understanding; that it is the sponsor for that exhaust code.

Mr. STEWART. That has been going on for 13 years. I wonder if this association could not manage to get out an exhaust code?

Mr. KEARNS. I think it should. We need it.

[The following report on the status of American standard safety codes developed or under process of development under the procedure of the American Standards Association, in which the International Association of Industrial Accident Boards and Commissions is interested as a sponsor or through representation on sectional committees, was submitted by Mr. Ainsworth:]

**REPORT ON STATUS OF AMERICAN STANDARD SAFETY CODES IN WHICH
THE I. A. I. A. B. C. IS INTERESTED AS A SPONSOR OR THROUGH REP-
RESENTATION ON SECTIONAL COMMITTEES**

By CYRIL AINSWORTH, *Assistant Secretary American Standards Association*

Projects for Which I. A. I. A. B. C. Is Sponsor

B7 (1930).—Safety code for the use, care, and protection of abrasive wheels

A revision of this code is now before the sectional committee covering the guarding of coping wheels. A final draft for presentation to the committee is in course of preparation following the conducting of exhaustive research carried on under the auspices of the Grinding Wheel Manufacturers Association and the National Bureau of Casualty and Surety Underwriters.

The sectional committee has just completed the appointment of a special subcommittee to act for the sectional committee in presenting to the American representatives of the international committee on accident prevention of the International Labor Office the American point of view concerning the proposed international monograph covering the use, care, and protection of abrasive wheels. This subcommittee has been appointed and is reviewing recommendations of the Grinding Wheel Manufacturers Association resulting from studies of the international monograph.

B15 (1927).—Safety code for mechanical power transmission apparatus

No revision of this code is under contemplation at this time.

B28 (1927).—Safety code for rubber machinery

No new standards are under consideration and no revisions of existing standard have been undertaken.

O1 (1930).—Safety code for woodworking plants

No revisions are under way.

Z16.—Standardization of methods of recording and compiling accident statistics

A letter ballot of part 1, covering rates, has just been taken, and part 2, on causes, is to be sent to the sectional committee for letter ballot within a very short time.

A complete report on this project will be presented by Dr. Hatch, chairman of your committee on statistics, and chairman of the sectional committee.

Z9.—Safety code for exhaust systems

As reported at your last convention, your association has assumed sponsorship for this project in place of the American Society of Heating and Ventilating Engineers. The sectional committee has been reorganized; two meetings of the committee have been held. A proposed new scope has been adopted by the committee and the appointment of subcommittees authorized. The new scope of work which this committee proposes to undertake is of special importance and of interest to you at this time. This proposal covers the development of a series of standards in the field of occupational diseases, particularly in the relation of the use of exhaust systems as a means of removal of the toxic dusts, gases, and fumes causing such diseases. If this proposal is approved by the American Standards Association, it will mean the launching of a program at least as extensive as that now under way in the field of prevention of accidents and a program with which your association and the individual members of your association will want to keep closely in touch. These proposals are now being studied by the safety code correlating committee, with a view toward final recommendation to the Standards Council of the American Standards Association.

**Projects for Which the I. A. I. A. B. C. Has Representation on Sectional
Committees**

A9 (1929).—Building-exits code

A review of this code was prepared by the sectional committee and was approved by the sponsor, the National Fire Protection Association, at its annual meeting in May. It is expected that the revised document will be submitted to the American Standards Association for approval as American standard within the next few weeks. This revision covers some changes in the number of exits required, particularly for tall buildings, and the relation of such exits to elevator facilities. In the meantime the committee is

considering further revisions of the code for future editions, particularly on questions which have been presented to the committee concerning form and arrangement. The new revisions have been worked out in cooperation with the former building-code committee of the Department of Commerce.

A10 (1934).—American standards for safety in the construction industry

To meet the needs of the Public Works Administration the sectional committee recommended to the American Standards Association the approval of the Safety Manual for Construction Work, prepared by the Association of General Contractors of America. The American Standards Association accepted the recommendation of the committee and approved this manual as an interim standard pending the completion of a full American standard for this industry.

A11 (1930).—Code of lighting: Factories, mills, and other work places

No revisions are in contemplation at this time.

A12 (1932).—Safety code for floor and wall openings, railings, and toe boards

No revisions are in contemplation at this time.

A14 (1928).—Safety code for the construction, care, and use of ladders

A final draft of the revision of this code has been prepared following exhaustive research work carried on in the laboratories of the American Telephone & Telegraph Co. and the Forest Products Laboratories of the United States Department of Agriculture. This final draft is now being balloted upon by the sectional committee with a view toward submission to the American Standards Association for approval. This revision covers all types of ladders and all recent developments in the construction of ladders and is now being considered by a special committee appointed by the New Jersey Department of Labor as the basis for State regulations of that department.

A17 (1931).—Safety code for elevators, dumbwaiters, and escalators

No revisions of the basic code are under consideration for presentation to the American Standards Association at this time. The handbook for elevator inspectors is practically completed and is now being edited for submission to the committee for final approval.

A22.—Safety code for walkway surfaces

The special code-drafting committee has not been able as yet to prepare a tentative draft of this code for consideration by the sectional committee. In view of the number of changes in personnel it will be necessary to reconstitute this committee and this is now under consideration by the chairman of the committee.

A39 (1933).—Safety code for window washing

New information has recently been obtained which will probably bring about a revision of this code within the next year. This information resulted from exhaustive research conducted by the National Bureau of Casualty and Surety Underwriters at the Underwriters Laboratories in Chicago. The present code does not provide for any factor of safety in the design and construction of a window cleaner's belt which will protect the workman in case only one end of his belt is screwed to the window and he slips from the window sill and falls the distance of the length of the belt. These tests have proven beyond the shadow of a doubt that the present design and construction of such belts is such as to provide very little protection to a window cleaner who might fall under such conditions. All of this technical data is to be presented to the sectional committee and to a conference of manufacturers of this equipment and representatives of other interested groups for discussion of possible changes in the design of this equipment.

B9 (1933).—Safety code for mechanical refrigeration

The chairman of this sectional committee has recently requested all members of the committee to present to him their suggestions for possible revisions to this standard preparatory to the appointing of a section of the committee this fall to consider the necessity for undertaking a revision.

B13 (1924).—Safety code for logging and sawmill machinery

No revision is under contemplation at this time.

B19.—Safety code for compressed-air machinery

The sponsor for this project, the National Safety Council, has discharged the original committee with a view toward the appointment of a new committee and election of new officers in an endeavor to bring this project to completion.

B20.—Safety code for conveyors and conveying machinery

Due to economic conditions it has been impossible to get the various subcommittees for this code to give consideration during the past year to drafts of the sections under their jurisdiction which had previously been prepared. The serious illness, finally resulting in the death, of the chairman of this committee has also seriously interfered with the advancement of this work. The sponsor organization plans to endeavor to reorganize the work of the committee so that it can go forward looking to completion during the coming year.

B24 (1927).—Safety code for forging and hot-metal stamping

No revision of this code is under contemplation at this time.

B30.—Safety code for cranes, derricks, and hoists

Due to economic conditions which have seriously involved a number of the members of this code, it has not been possible to complete the work of this project, which had progressed to an advanced stage.

B31.—Code for pressure piping

Final draft of this code is now before the sectional committee for final approval and should be submitted to the American Standards Association within a very short time.

C1 (1933).—Regulations for electric wiring and apparatus in relation to fire hazards

This committee is a permanent committee which reviews new proposals from time to time looking toward the development of a new edition every 2 years. The next edition will be completed in the spring of 1935.

C2 (1927).—National electrical safety code

No revisions of this code are under consideration at this time.

K13 (1930).—Code for identification of gas-mask canisters

No revisions of this code are under consideration at this time.

L1 (1929).—Textile safety code

No revisions of this are under consideration at this time.

P1 (1925).—Safety code for paper and pulp mills

A revision of this code is now under consideration by the sectional committee. The final draft of the revision, however, has not as yet been prepared.

Z2 (1922) (formerly X2).—Safety code for the protection of the heads and eyes of industrial workers

A revision of this project has been undertaken. The principal phase of this revision covers the preparation of specifications for respirators. A draft of such a group of specifications has been placed before the committee, but the committee has not as yet been able to reach any final conclusion on these proposals in view of the fact that it feels that there is not at present sufficient technical data on the threshold limits for toxic dusts which such respirators are designed to prevent from being breathed by workers. This revision is of very great importance and should receive the careful consideration of the members of your association.

Z4.—Safety code for industrial sanitation

The final ballot on three standards, namely, sanitation for industrial establishments, specifications for drinking fountains, and specifications for privies, has been approved by the sectional committee and will be submitted to the American Standards Association for approval by the sponsor, the United States Public Health Service, within the next week or two.

Z5.—Ventilation code

Considerable progress in the development of this standard has been made since the last report was submitted to your association. Several meetings of the committee have been held; a new scope and plan of operation has been adopted. Several subcommittees covering particular occupancies, and a subcommittee on fundamentals, have been appointed. The work of the committee on fundamentals is particularly important at this time, as the recommendation it will develop will form the basis of the requirements for ventilation of the particular type of buildings coming under the jurisdiction of the committee. The sponsor is very active in guiding the work of this project, and it is now expected that the work will go forward rapidly toward completion.

Z8 (1924).—Safety code for laundry machinery and operations

No revision is under contemplation at this time.

Z12.—Safety code for the prevention of dust explosions

No revisions of existing standards under this project are contemplated at this time.

Z13.—Safety code for amusement parks

The economic stress within this industry has prevented the completion of any of the sections of this code. A number of drafts of sections have been prepared with the assistance of the American Standards Association staff, but it has not been possible within the past year to get any consideration by the committee of this work.

[An application by the Lumbermen's Mutual Casualty Co. for associate membership was read by President Parks and referred to the executive committee for action thereon.]

[The report of the electrical code committee was presented by the chairman, Mr. Charles H. Weeks, of New Jersey.]

REPORT OF THE ELECTRICAL SAFETY CODE COMMITTEE

By CHARLES H. WEEKS, *Chairman*

Your electrical committee members have been very closely occupied with their locally pressing problems related to the depression and to various movements growing out of the campaign to remove the depression and to avoid future ones.

Throughout the year, however, the experiences and suggestions of the members on electrical safety and code matters have been coming in. In Wisconsin the State electrical code is being revised in an effort to take account of recent changes in products and practices. In California a new edition of the State electrical safety orders has been issued. In both these States the industry has constructively aided the necessary studies. In both, the national electrical code and the national electrical safety code have been utilized as the minimum standards and as few additional requirements as seemed reasonable have been added, and where added this has been done because these national codes were found not to take enough into account the varying conditions of occupancy, construction, number of persons exposed, and the likelihood of injury or fire, due to these varying conditions. While the national codes are being so slowly improved in these respects, the State and city codes apparently must take the lead, wherever our good judgment finds such improvements necessary. This will help the national codes to make progress.

At this time our New Jersey electrical safety rules are under revision, and we are finding the need for differentiating between places where many persons are employed or assembled and places where few are affected by any hazards existing. Our general electrical rules will deal with these situations and will continue to use the present national codes as part of our minimum requirements. For special kinds of occupancies or kinds of processes we shall continue to have additional special electrical rules, but we are making an effort to bring these into greater harmony than at present, where the hazards of the various occupancies are similar. Thus for woodworking the necessary special rules may be similar to those for cotton mills but quite different from those for chemical plants.

During the following year your electrical committee, if continued, should make a study and recommendation for adoption by States of the necessary additional electrical rules where many persons are exposed, and where special conditions of occupancy or processing call for appropriate additions to the minimum requirements of the national codes, which codes have not yet taken

these important considerations into account except for the hazardous locations in article 32, theaters in article 36, and in a few others of the many special cases which must be dealt with by our industrial accident boards and commissions. By putting constructive suggestions along these lines in our next annual report, both our State departments and the various industries concerned, as well as the electrical industry, will be much benefited.

The fact that the N. R. A. has so greatly stimulated industries into adopting minimum safety requirements, and that many of these industries are now groping about in an effort to arrive at satisfactory minimum electrical safety rules, is an indication of how urgently this kind of work by our committee is now needed. We shall, of course, keep closely in touch with the United States Safety Rules Committee appointed by Secretary of Labor Perkins, which has been engaged in stimulating industries to adopt such rules, and requiring that they shall conform to the State rules in effect from time to time. Fairly uniform and adequate State rules would nearly solve this problem for industry. If your committee is continued it would be advisable to appoint a subcommittee to work out a series of State electrical rules, including a master set of rules, based on and including the national codes (probably adopting them by a suitable reference), which can apply to all situations, while each of the other supplementary sets of rules applies to one or more of the many classifications of industries whose particular problems are already being dealt with by some of the States through separate sets of safety standards.

Another problem, a related one, has been urgently called to my attention during the past year. We have been setting up our standards for materials, methods, and workmanship, but have not done enough toward seeing that those who undertake to do electrical work are qualified to do it properly and safely. In most States, including New Jersey, some cities have attempted to solve this problem by setting up local examining boards and requiring any electrical contractor who wishes to do electrical work first to pass an examination before this board, which usually contains appointed representatives of the contractors. In many cities each workman must also first pass an examination, on the theory that no foreman can see every part of the work and a poor workman's mistakes show up only in fires and accidents and poor service.

The trouble with city examinations and licenses is that they do not cover the workmen in factories and workshops outside these cities, and thus large areas and many employees are left exposed by electrical contractors and workmen who may be very poorly qualified and quite free from any restraint as to how they shall do their work.

A few months ago, several persons, representing various branches of the electrical industry, brought to my attention a proposal that in New Jersey there should be a State board of examiners of electrical contractors. The proposal is being sponsored by the New Jersey Council of Electrical Leagues which is securing assistance, in drafting a proposed law, from the National Electrical Manufacturers Association. The proposal as submitted to me sets up the New Jersey Board of Examiners for Professional Engineers and Land Surveyors as the examining board for electrical contractors, stating that any city must accept the registrants admitted by this State board to do work in other cities, even though the State may have admitted some entirely incompetent contractor because he was already established as a contractor in some small community. Naturally some city representatives are objecting to this effect of such a State law. Some other persons have raised a question as to whether the State board of examiners for professional engineers should enter the field of examining contractors for wiring.

On the other hand, no one seems to question the main apparent aim of the proposed law, to improve the quality of workmen and workmanship on electrical installation work outside the larger cities. Some believe that any defects in the proposed law will soon be worked out of it and an acceptable law will be introduced and passed.

It would be of great service to me if I had before me a model State license law for electrical contractors and wiremen, and it might be advisable for a subcommittee to be appointed to provide such a model law. The work already done by the National Electrical Manufacturers Association along this line will be of great help to the subcommittee.

One other subject, I believe, needs to be called to the attention of the association. Our committee and association have up to this time participated in the support and use of the national electrical code and have participated through a small representation in the work of the electrical committee of the National Fire Protection Association, which prepares the succeeding editions of the national electrical code. As we realize, one of the duties of our own electrical committee is to cooperate constructively with this other electrical committee. In order to do this better, we are requesting larger membership on the other electrical committee. We now have 1 member out of 44 on that other committee, but the electrical utilities have 7 and the electrical manufacturers have 7. Fortunately the Association of Municipal Electrical Inspectors also has 1 member, and the International Association of Electrical Inspectors also has 7 members. The Municipal Association, like our own, is asking for greater representation. We have only 2 representatives on the electrical committee of the National Fire Protection Association who exclusively represent governmental regulatory associations. It is a fortunate fact, however, that the officers of the International Association of Electrical Inspectors are awake to this situation and its disadvantages and are in touch with us.

Even this very unsatisfactory representation of the public and its regulatory authorities on the electrical committee, however, would probably not need to come to your attention at this time were it not for a very unfortunate movement recently promoted by some electrical utility men, joined in by some electrical manufacturer men, and then joined in also by some insurance men. This movement was aimed at taking the national electrical code away from the National Fire Protection Association and giving it wholly into the control of a committee of the American Standards Association on which the utilities and manufacturers have very large membership and the inspectors none at all. In other words, if this movement had gone through, our association would have no representation whatever in the superior court. Instead of the National Fire Protection Association we should have had the electrical standards committee of American Standards Association to deal with, and we should have to deal with that committee from its outside.

I am informed that the men who led these so-called "triangle meetings" included some prominent utility, manufacturer, and insurance men; that is, they were prominent in the electrical committee of the National Fire Protective Association and prominent also in the electrical standards committee, and I am further informed that they did not invite into these discussions any inspectors nor any State authorities. They did not tell the inspectors nor our committee that they were holding such meetings. They even refused to answer inquiries from the inspectors as to what the meetings were discussing, what proposals were being made or tentative conclusions reached in regard to the future character and control of the national electrical code. We were kept in touch with these happenings by the inspectors and the proceedings of the National Fire Protective Association convention.

You can, therefore, see how much concerned is our association and our own electrical committee, if we are going to continue to use this national electrical code, to be sure that its character and control are not determined without consulting us. The electrical committee of the National Fire Protection Association has now been placed in the position of being a subsidiary committee instead of being the primary committee that it used to be. Our own committee should not lose sight of this change in the character of the electrical committee of the National Fire Protection Association, and in the control of the code, and we should keep thoroughly awake and cooperate with the International Association of Municipal Electricians and the International Association of Electrical Inspectors who have been active in developing the above facts and in protecting themselves, us, and the public against movements which would place control of the national electrical code wholly in the hands of certain commercial groups. For members who wish to read a very general and evidently restrained story of this movement and its outcome, the story told by Mr. A. R. Small, as given in the proceedings of the National Fire Protection Association for 1934, will be very interesting. For a more detailed account of these happenings members may write or preferably interview the presidents of the International Association of Municipal Electricians and the International Association of Electrical Inspectors.

Your electrical committee, if continued, I am sure will continue its efforts to keep informed on all movements affecting our electrical safety standards, and will endeavor to assure the advancement of the interests of our members, of workmen, and of the public.

The article committees for 1934-35 contain the following representatives of the I. A. I. A. B. C: Charles H. Weeks, of New Jersey—articles 30, 34, and 35; B. P. Foster, of Delaware—article 31.

I ask for the adoption of this report, and wish to take this opportunity of thanking each member of our committee for the interest he has taken in the work and the assistance he has rendered during the past year.

[Mr. Cyril Ainsworth, assistant secretary of the American Standards Association, made a statement of the position of the American Standards Association in the matter referred to in the latter part of the report of the electrical safety code committee, declaring that "so far as the American Standards Association is concerned, there has been absolutely no proposal of any kind submitted to it, or to any of its committees, in writing or by suggestion, that such action as has been referred to be taken", and offering, if any further facts were desired, to make available the complete files of the American Standards Association.]

[Mr. Ethelbert Stewart also made a few remarks on the subject.]

[The report of the medical committee was presented by Dr. Francis D. Donoghue, the chairman of the committee.]

REPORT OF MEDICAL COMMITTEE

By FRANCIS D. DONOGHUE, M. D., *Chairman*

I should like personally to say that I appreciate the opportunity of being chairman of this committee of your organization. I was chairman of the medical committee from 1916 to 1920; I am also glad to see that so many of my old friends have survived and are here for this meeting.

In making up the medical program, letters were sent to all members of the committee, and their suggestions ascertained as to what they would like for

purposes of discussion, and therefore the program for Wednesday carries out the wishes of the medical men associated with the various industrial accident boards of this country and of Canada.

The meeting in the morning at the Massachusetts General Hospital is covered by men each one an expert in the particular line on which the paper is given; and it is suggested by those men that those who are interested in asking questions write them out and place them in a questionnaire box at the hospital, and they will be covered at the end of the first program at the Massachusetts General Hospital. The final thing on the program at the Massachusetts General Hospital is a reproduction of the first operation under ether in the place where it actually occurred. That will take a matter of 40 minutes.

On the adjournment then to this hotel one of the analyses made by a competent medical adviser to one of our insurance companies as to the increased cost of the disabilities will be taken up; and the second paper will deal with the new method of treating fractures of the hip, not in technical language but in language that you can all understand and take home to your medical departments.

In the afternoon we have, first, low back sprains, which is one of the bete noirs of all compensation boards, treated by Dr. Goldthwait, who was in charge of the postural department of the Army during the late war. We do not give him his title in the Army, which was brigadier general, but still call him "Doctor" Goldthwait of Boston.

"The Crippled Shoulder", by Dr. Codman, represents a series of cases that were submitted to him as an impartial examiner by our board, in which he discovered certain things on ruptured muscles which could be remedied. A copy of the outline of his paper is available for the members.

"Curing the Crippled Hand"—Dr. Browne was put to work way back in 1919, because the hand at that time was looked upon as of nonsurgical interest in most hospitals, whereas from the workmen's compensation standpoint injuries to the hand and the arms comprise a big proportion of compensation cases, and anybody who can remedy that condition is doing a great work. Dr. Browne will show you something of his work.

The "low back" cases, low back strains in men, are so complicated that they require an analysis such as Dr. Howard has given them.

The "diseased heart", again, is an important thing in a State such as ours where we have a law covering any injury arising out of and in the course of employment, and the giving out of a diseased heart upon the job has been found to be compensable, as well as general deaths occurring where unusual stress is thrown upon a heart already diseased.

"The importance of pathological examinations" is manifest to all members of workmen's compensation boards. Of course, there is a great problem connected with that—as to how far boards should go. I have an opinion that they should go only so far as to be in the position of "next friend" in ordering autopsies if no next friend be available.

During the proceedings of Wednesday the medical committee will gladly receive, in the form of a questionnaire, any questions anyone would like to have answered on any of these subjects, and they will be taken out at the close of the meeting Wednesday.

The medical program represents the report of the medical committee, with such amplification as I have given it. I hope you will all enjoy it, and if there is any part of it that is not covered to your satisfaction, please let me know and we will see if we can remedy it before you go.

[The report of the committee on forms was read by Mr. Swen Kjaer, Mr. Sidney W. Wilcox, the chairman of the committee, being unable to be present.]

REPORT OF THE COMMITTEE ON FORMS

By SIDNEY W. WILCOX, *chairman*

[Read by SWEN KJAER.]

At the time of the 1933 annual meeting of the association a year ago the committee on forms reported that 11 States had taken partial or complete action toward adopting the standard forms which received the approval of the association in the meeting at Columbus, Ohio. The States are as follows: Alabama, Connecticut, Georgia, Iowa, Louisiana, Massachusetts, Nebraska, New Hampshire, Tennessee, Vermont, and Virginia.

During the year since this report was made one or more of the forms have been adopted by an equal number of States. The new States are: California, Indiana, Kansas, Kentucky, Maryland, Missouri, Montana, Rhode Island, South Dakota, Texas, and Utah. Considerable interest in the use of the standard forms has also been shown by the United States Employees' Compensation Commission.

The committee wishes to place in the record again an acknowledgment of the valuable work done by the committee on forms of the National Council on Compensation Insurance and especially of the efforts of Mr. H. F. Richardson, secretary of the council, and Mr. Thomas N. Bartlett, whose services as member of the committee have been of outstanding value.

DISCUSSION

Chairman BAKER. Are there any remarks or any questions? The report will be referred and made a matter of record.

Mr. KJAER. I ask that Mr. Richardson be allowed to give a supplementary report on that. He has a list of the States that have adopted it.

Chairman BAKER. All right, we will hear from Mr. Richardson.

Mr. KJAER. Incidentally, there was a reference here to the United States Employees' Compensation Commission. Mrs. Swofford, the chairman of the commission, is present, and it might be advisable to have her speak a few words on that. The commission is already considering the matter.

Mr. RICHARDSON (New York). During the past year we have made considerable progress in contacting additional boards and commissions with reference to the standard forms which were approved by your convention in Columbus. At the present time there are 22 States where one or all of the five standard forms either have been approved or are available for us by the insurance carriers. We have had sympathetic attention by the various commissions, and while we have not been able to contact all of the commissions yet to explain thoroughly the advantages of this program, we do feel that it has received such an appeal from the commissions that we must thank them and hope that they all will come into line very shortly.

The 22 States referred to are as follows:

Alabama	Louisiana	South Dakota
California	Maryland	Tennessee
Connecticut	Massachusetts	Texas
Georgia	Missouri	Utah
Indiana	Montana	Vermont
Iowa	Nebraska	Virginia
Kansas	New Hampshire	
Kentucky	Rhode Island	

Chairman BAKER: Now we will hear from Mrs. Swofford, of the United States Employees' Compensation Commission.

Mrs. SWOFFORD (Washington, D. C.) We had hoped to have made some contacts before this meeting, but, due to the amount of work in connection with the C. C. A. and the C. W. A. thrown upon our commission, we are decidedly behind the schedule. We have sent the various forms to the various deputy commissioners, and they have sent in their recommendations, but we have not yet had the opportunity to make a thorough digest of them. I feel confident that, if possible at all, we shall be glad to adopt the standard forms, of which only three out of the five would be useful for our needs. I think we can be included in this list next year.

[The report of the committee on workmen's compensation legislation was presented by Mr. Abel Klaw, the chairman.]

REPORT OF COMMITTEE ON WORKMEN'S COMPENSATION LEGISLATION

By ABEL KLAW, *Chairman*

Your committee on workmen's compensation legislation desires to report as follows:

At the last annual meeting of the association, no action was taken on any matters which could be construed as being in the nature of instructions for the guidance of the committee during the year. Accordingly, our activities have been limited to forwarding communications to the workmen's compensation commissions in those States where the legislature was in session, enclosing a copy of each of the uniform provisions which have received the approval of the association, and urging that an effort be made to have the same enacted as a part of their respective workmen's compensation laws. These communications were addressed to the commissions in the States of Iowa, Kentucky, Louisiana, Massachusetts, Michigan, Missouri, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Virginia, and West Virginia. In addition, communications were forwarded to interested State officers in the States of Mississippi and South Carolina, requesting that if a movement toward the enactment of a workmen's compensation law should be started, the proposals adopted by our association be submitted to the proponents of the same, in order that consideration might be given toward having the approved uniform provisions enacted as a part of any proposed workmen's compensation law.

A recent check has been made of the results attained, and replies have been received from practically all of those addressed in the first instance. In no case, however, has definite information been received as to the effect that the proposals advocated by this association have been adopted. In many instances those addressed merely replied that their respective laws already cover the subjects suggested, with more or less similarity in provision.

It will be recalled that the specific subjects which have been given consideration and approval by our association cover provisions with reference to insurance coverage, extraterritoriality, third-party liability, and second-injury funds. This committee has not undertaken to function in any way with respect to workmen's compensation law amendments generally, but, on the other hand, has interested itself in legislative matters solely for the purpose of urging the enactment of uniform provisions with respect to the subjects mentioned.

It is regretted that, on account of geographical location, it has been impossible to arrange for a meeting of the committee as a whole during the past

year. Likewise, for the same reason, any active effort on the part of the members of the committee to secure the adoption of our proposals has been impossible, and the matter has necessarily been left in the hands of the State agencies which have been contacted.

Your committee reiterates the statement made in last year's report to the effect that State agencies must be educated to realize the necessity for uniform provisions. Constructive progress can be accomplished only if the members attending the annual meetings return to their respective States with the conviction that uniform provisions are desirable, and that the prevalent feeling of satisfaction with the wording of their present law should be altered.

Your committee has continued its previous contacts in the effort to further a feeling of cooperation between the various State commissions with reference to those provisions of the law which are irreconcilable, and it is hoped that the initiative which some of the members of the association have taken to lay the groundwork for the enactment of the uniform provisions adopted by this association will soon be productive of favorable results.

In closing, your committee again urges that each commission consider itself as a committee of one in its own State to see to it that the proposals approved by this association are introduced in their respective legislatures.

REPORT OF SPECIAL COMMITTEE ON CONSTITUTIONAL CHANGES

By *ETHELBERT STEWART, Chairman*

As instructed by the last convention, I have revised the constitution, cutting out some, not all, of the matter that has never been used, and it leaves two pages. Under the old constitution and under this proposed revision the constitution must be read in open meeting. I can do one of two things: I can ask the secretary to read it, or I can ask you to delay the proceedings and refer it to a committee, with a report for some subsequent day. Under the old constitution it must be introduced at the first session, but that, of course, is out of this revision and it is to be referred to a committee. Do you want it read?

[Secretary Baldwin suggested that copies of the revised constitution be distributed to the members in lieu of reading it at this time, which would be equivalent to reading the constitution and the chairman so ordered.]

[Meeting adjourned.]

MONDAY, SEPTEMBER 24—AFTERNOON SESSION

Chairman, G. CLAY BAKER, Commissioner of Labor and Industry of Kansas

Chairman BAKER. The first topic, The Effect of N. R. A. Codes on Workmen's Compensation Administration is divided into two subjects, the first being Does the Federal Emergency Relief Program Place the Responsibility for Compensation on the Locality, or Should the Federal Government Assume This Obligation? This question will be dealt with by the Honorable Thomas M. Gregory, chairman of the Department of Industrial Relations of Ohio.

Does the Federal Emergency Relief Program Place the Responsibility for Compensation on the Locality, or Should the Federal Government Assume This Obligation?

By THOMAS M. GREGORY, Chairman, Industrial Commission of Ohio

The subject is one of interest, primarily because of recent developments in the emergency that is abroad in the States affecting the welfare of a great many people.

Two propositions are embraced in the subject, and for convenience and to avoid confusion they are considered separately.

The act of Congress under which the relief program has been set up is known as Public Act No. 15, Seventy-third Congress. It in part provides for setting aside \$500,000,000 out of the Reconstruction Finance Corporation's funds and establishes the Emergency Relief Administration, and confers the powers of administration on an Administrator who is given general supervision of the work and the power to disburse the funds for designated purposes.

Section 4, paragraph (a) of the act, provides—

Out of the funds of the Reconstruction Finance Corporation made available by this act, the Administrator is authorized to make grants to the several States to aid in meeting costs of furnishing relief and work relief and in relieving the hardship and suffering caused by unemployment, in the form of money, service, materials, and/or commodities to provide the necessities of life to persons in need as a result of the present emergency, and/or to their dependents, whether resident, transient, or homeless.

In accordance with paragraph (e) of the section, the decision of the Administrator as to the purpose of any expenditures is made final.

By observing the terms of the paragraph of the act quoted, it will be noted that the purpose which is clearly indicated is to make grants to the several States to aid in meeting the cost of furnishing relief through providing the necessities of life.

There is no attempt in the act to set up a general work program or to limit the relief to a consideration for services to be rendered.

The act does not make it a condition precedent that any State

desiring a grant of funds for the indicated purposes shall first make provision for paying benefits through some form of compensation to injured relief workers.

The rules and regulations which have been issued concerning Federal emergency relief provide in part—

That the personnel employed on work relief projects by the States or their subdivisions are not Federal employees and must not be considered as such, therefore, premiums for accident insurance in connection with work-relief programs may not be paid from Federal funds but should be paid out of State or local moneys.

* * * * *

The persons employed on work-relief projects by the States or their subdivisions ought to be covered by compensation or accident insurance.

From these expressions it will be noted that it is the desire of the Federal authority that the States and local subdivisions should make provision for some form of benefits for persons experiencing disabilities as the result of injuries occasioned in the course of relief work.

The duty to provide for the indigent and paupers rests primarily upon the States and their subdivisions. The Federal Government has entered the relief field only because of the fact that the States have been overtaxed by charity burdens due to the abnormal state of unemployment throughout the country.

There is no apparent reason why Congress at the time it made provision for extending aid to the States might not have imposed as one of the conditions upon which grants were to be made to the States and their subdivisions, the requirement that the localities should make provision for some form of benefits to persons experiencing disabling injuries in the course of relief work.

As the act of Congress and the rules issued in the furtherance of the administrative features of it have not imposed a mandatory requirement in this regard, it is concluded that the Federal authority has not imposed any added responsibility on the localities for compensation to injured relief workers.

In approximately 18 of the States it has been held that their compensation acts cover relief workers. In some instances it required extremely liberal interpretation so to hold.

The applicability of compensation acts to relief workers in the absence of express or apparent terms is very questionable. In cases where the acts have been construed to apply, it is quite evident that the findings were prompted in some measure through sentimental and sociological influences. We cannot be unmindful of the part that such influences play in human affairs, but they should not be permitted to prevail over or destroy principles and institutions which have proven to be of certain value through extended experience.

Some of the States have amended or supplemented their compensation acts so as to make provision for relief workers.

Workmen's compensation was conceived and developed for the primary purpose of providing substantial benefits to industrial workers who experience injuries in the course of their employment, and to the dependents of such of the workers who die as result of the injuries, through some simple course of procedure unencumbered by ancient legal technicalities and barriers. The benefits thus provided were to reimburse in some substantial degree the injured worker for

his impairment in earnings by reason of disabilities suffered, and in the event of death to provide to the dependents a substitute of some proportion for the support they previously enjoyed.

It further comprehended that industry should make a substantial contribution toward the depreciation in earning power of the human element engaged in industry, as result of injuries which the personnel experienced in the course of its service, thereby relieving society of a major part of the burden which it formerly had to bear by way of charity.

By reason of the application of the compensation principles industrial workers in most all instances enjoy net benefits for virtually all injuries, regardless of fault, in amounts comparing favorably with, if they do not exceed, net returns obtained through civil actions where there were actionable grounds associated with the injuries involved.

The compensation policy was inaugurated to escape the embarrassing and depreciating influences and burdens of charity, and to provide a substitute for earnings workers enjoyed before injury; hence it should not now be permitted to be swept into the field of charity under the influence of the spirit of frantic immediacy and sentimentalism.

As the obligation of the State to care for its inhabitants who suffer for the lack of actual necessities is constant, it is quite difficult to understand how it can discharge such requirement through a compensation system, as charity obligations are not predicated upon engagements between employers and employees, or upon the amount of wages received, or services to be rendered, by the recipients.

And further, a person not having an income from independent sources or from wage earnings, naturally cannot contribute to the support of other persons; hence there would be no basis for determining death benefits when death occurs to such a person.

If the workmen's compensation principle is permitted to become confused with charity, it is just a question of time until compensation benefits will be diverted into unemployment and old-age relief. Unemployment and old-age relief may be desirable but they should be provided for through independent arrangements and entirely apart from workmen's compensation.

Some may look upon physical impairment resulting to the individual by reason of an accident as the controlling factor in determining whether the principle of compensation should apply. If the elements of voluntary and productive service and wages are to be ignored, it is appropriate to inquire: What class of cases should be excluded?

Coming now to the latter part of the subject, it must be appreciated that the Federal Government, with a view of promoting the general welfare of the Nation, has extended its aid temporarily to the States and their political subdivisions, to assist them in responding to an obligation which is primarily theirs—and it was only because of the extreme urgency that the assistance was granted—hence there is no justifiable reason why the Federal Government should assume any of the obligations arising from injuries to relief workers who are under the supervision and control of the localities.

If the Federal and State Governments, by reason of the temporary emergency, permit the diversion of the workmen's compensa-

tion principle into charity channels, they will contribute in some degree in destroying self-respect, in thwarting ambition to render service for personal benefit, and in inculcating in the minds of a great number of persons that the State owes them a living and care under all circumstances, regardless of employment conditions.

Some form of care and relief is necessary and desirable for persons experiencing disabling injuries in the course of relief work, but it should be provided through a program independent of workmen's compensation.

[The following paper on the subject: Are Beneficiaries Under the Made-Work or Relief Program Employees Within the Meaning of the Workmen's Compensation Act? If So, Employees of Whom? by Mr. Hal M. Stanley, chairman of the Department of Industrial Relations of Georgia, was submitted but not read, as the printed copy failed to reach the convention in time. In place thereof Mr. Charles F. Sharkey read an article on the status of relief, etc., workers under workmen's compensation laws, prepared by him and later published in the Monthly Labor Review for September 1934 (p. 660).]

Are Beneficiaries Under the Made-Work or Relief Program Employees Within the Meaning of the Workmen's Compensation Act? If So, Employees of Whom?

By HAL M. STANLEY, *Chairman Department of Industrial Relations of Georgia*

[Submitted but not read]

The subject assigned me for discussion—Are Beneficiaries Under the Made-Work or Relief Program Employees Within the Meaning of the Workmen's Compensation Act? If So, Employees of Whom?—is one that has given us considerable concern in Georgia.

Desiring at the very outset to emphasize the fact that I am speaking in no partisan sense, I wish to say that I am in perfect accord with the President and the Congress of the United States in all matters affecting conditions as they have been and are now. While this is true, it is undeniably a fact that if Alexander Hamilton could come to earth again and realize how his policies have at last been recognized he would feel amply repaid for all of his efforts to establish a strong centralized government, and I feel very sure that Calhoun, Webster, Clay, Jackson, and all of the other contenders in the formative stages of this Government would marvel greatly at the changes that have taken place. All of us are now looking to the Government as an ever-present help in time of need and believe that the Government is the only agency that can supply that need. I have no doubt of the fact that the next Congress will rectify all errors and will adjust any conditions that may exist, to the end that all workers will be under some kind of compensation and will be paid when accidents arise out of and in the course of their employment.

At the inception of the relief program we took the position in Georgia that relief workers were employees of the political subdivision for which they were doing the work. Thereafter, the Civil Works Administration became effective and took over all Federal relief, direct and indirect. By Executive order all C.W.A. employees were

declared to be employees of the Federal Government and were to be compensated under the United States Employees' Compensation Act. This relieved the several States for the time being.

At the moment, however, those who are known as "relief workers" are to a large extent under no act. The Government has not placed them under the United States Employees' Compensation Act, but the different States must take them under supervision and many of them cannot do so. We have an anomalous situation in Georgia. Where an employee is working for a municipality compensation must be paid, even though the worker is not being remunerated for his services other than being placed upon the relief roll. If the State or a county is working such employee no compensation can be awarded. It is necessary to explain that in Georgia the State itself and the counties are not subject to the workmen's compensation act. In two contested cases awards were made against municipalities under the provisions of the compensation act for injuries to employees. In one of these (*City of Waycross v. Hayes*, 48 Ga. App. 317) the court of appeals upheld our award. Compensation in the other case, which was against the city of Atlanta, was paid as soon as the decision of the appellate court in the Hayes case was handed down. In removing the counties of Georgia from under the compensation act the supreme court did not hold that such a law was unconstitutional in itself but that the constitution provides how taxes can be levied and for what purposes. Since the Constitution of Georgia was in effect long before the compensation law there is naturally no provision to levy taxes for the purpose of paying compensation or a compensation insurance premium. In order that compensation coverage may be effective in counties in Georgia an amendment to the constitution is necessary. One can imagine how difficult that will be when people are already everywhere demanding tax reductions.

The conditions in Georgia are not at all unique. Each State is having similar conditions to face, with variations, of course. Under the C. W. A. there were at one time as many as 84,237 workers in Georgia. During that period there were 7 deaths and 610 lost-time accidents. Under the Georgia law there would have been 25 percent less lost-time accidents, because the Georgia law requires a 7-day waiting period and the United States Employees' Compensation Act has a 3-day waiting period. On April 1, last, all C. W. A. work terminated and certain activities were taken over by the Federal Emergency Relief Administration, more familiarly known as "F. E. R. A."

At the present moment in Georgia F. E. R. A. workers are given \$100 medical attention and \$100 surgical attention, but nothing else, except in cases of death, and in that event \$100 is appropriated as a funeral benefit. There have been approximately 1,000 accidents in my State under the F. E. R. A., including 4 deaths. No compensation is being paid except in the form of direct relief, but a plan has been suggested and forwarded to Washington for approval permitting the payment of compensation to all permanently disabled employees and those specifically disabled and death benefits in cases of fatal accidents. No plan has been devised by which compensation would be paid for temporary total disability. The plan proposed uses the Georgia law as a basis in all matters except that of medical. In cases of disability not of a permanently disabling or specific nature, while no compensation is paid, the worker is kept upon the relief roll

and relief is furnished in lieu of compensation, which will end when the work is finished.

In passing I might state that C. C. C. workers and workers engaged in the United States Coast and Geodetic Survey and the United States Geological Survey are compensated on the basis of the United States Employees' Compensation Act under the supervision of the F. E. R. A. officials in the various States. There are seven C. C. C. camps in Georgia at the present time and more than 300, largely civil engineers, are at work upon the Geodetic Survey.

There is a well-defined rumor that the F. E. R. A. has not proven satisfactory and that the C. W. A. will be restored to its status prior to April 1, perhaps with some modifications and additions. At the moment this matter may have been so settled as to make these remarks as uninteresting as dry bones and as much ancient history as a description of the battle in which Joshua commanded the sun to stand still.

As far as I know, very few States have given relief workers compensation, except Georgia, Louisiana, and New York. New York, however, provided that if a man worked but 3 days a week his earnings should be calculated for 3 days. This is in contradistinction to a Georgia decision, which held that a man who worked only 2 weeks each month should be paid compensation as if he were laboring full time. I dissented in that case, but the court differed from me.

The various States have endeavored to solve the question at issue in their own ways. A summary of what has been done follows as fully as I can ascertain.

In California, Michigan, North Carolina, and West Virginia relief workers are not considered employees within the meaning of the Compensation Act. In Georgia relief workers working for a municipality are employees within the meaning of the Georgia Workmen's Compensation Act (48 Ga. App. 317), but, as heretofore explained, relief workers of county and State are not, because the counties and the State are not subject to the Compensation Act. In Nebraska a relief worker for the city of Lincoln was awarded compensation, as was true in New York and Louisiana. Four States have enacted legislation governing the status of relief workers, viz, California, New Jersey, Pennsylvania, and New York. The New York act provides that an employee injured while engaged in relief work conducted by the State or any political subdivision shall be paid under the provisions of the act. In New Jersey the director of emergency relief is empowered to make an award to employees according to the provisions of the New Jersey act, such award to be paid from the emergency relief fund. In Pennsylvania a special relief compensation fund was created, to which each employer contributes who wishes to be relieved of liability. There is a 26-week waiting period. However, the injured employees and their families are taken care of by direct relief during this 26-week period. In New York the basis for payment to relief workers is the budgetary needs of the injured person's family and the payments are limited. Provision is made for setting aside from allocated relief funds such amounts as may be deemed necessary to meet claims. The application of the Compensation Act to relief employees in most States is in doubt. It is probable that under the present administrative plan there will have

to be legislative enactments in the several States to take care of these injured persons. To my mind it is a matter that should be handled out of the emergency relief fund. I see no point in getting a man emergency relief work and then, when he is injured, throwing him back on his community as a charity patient in worse shape than he was before there was an attempt to help him.

In many of the States both the State and all political subdivisions are subject to their respective compensation laws. This does not obtain in all of the States. Under the present set-up in Georgia all funds are handled through the counties, and since the counties are not subject to the Georgia Workmen's Compensation Act no compensation can be provided for relief-work employees. This situation obtains in other southern States. I therefore see no cure for the situation except for a uniform handling of all of these cases by the Federal Government. This may be done either by cooperation with the boards and commissions administering the local laws or by a set-up within the Federal administration to handle the cases separately. Unless provision is made for injured relief workers by the Federal Government, many of them will go uncompensated. While in my opinion employees under the relief program are employees of the political subdivision for which the work is being done and which is being benefited by the work, it is impossible to compensate them under many of the laws, and they should receive compensation just as any other injured employee.

I firmly believe that the United States Government will shortly prepare a plan by which all workers will be fully compensated when injured. It should be attended to as quickly as possible.

DISCUSSION

Mr. HARTWIG (Oregon). In listening to the very interesting paper by Mr. Sharkey, I rather got the impression that Oregon was not included among the States that were paying compensation to emergency workers. Am I right?

Mr. SHARKEY. Yes.

Mr. HARTWIG. We are paying compensation benefits to the emergency workers in Oregon. I recall the decision referred to by Mr. Sharkey, but a subsequent opinion by the attorney general definitely made or created the position or status of employees for the emergency workers, and declared the political subdivision to which the workers were assigned or which employed them to be the employer in the case and required to pay the premiums to the State industrial accident commission.

Mr. STEWART (Washington, D. C.). This matter was called to my attention some time ago. The whole business seems to be simply a shattering of the social legislation, the economic legislation, that we have been struggling for for 25 years—some of it bad enough, God knows, but most of it good. The trusts have gotten the trust laws repealed. The railroads have gotten every law they have objected to repealed. Every interest has gotten more than it ever expected to get, more than it ever thought of getting. Yet gradually, one by one, every social law and custom has been knocked on the head.

Every Senator in the United States Senate, whether he voted for section 7 (a) or not, knew exactly what it meant. It had not been much more than signed by the President before nobody knew what it meant, and nobody knows what it means now. The United States Government has passed laws which it makes no effort to enforce, where workmen cannot strike to enforce the laws of the United States. Our compensation laws have simply gone to pieces. There isn't any use being mealy-mouthed about this. Inside of a very few years the workmen of this country will demand the repeal of the whole business and the going back to catch-as-catch-can under the old common-liability law, and they will be justified in doing it.

I understand the C. C. C. and C. W. A. have been covered by the United States workmen's compensation law. Does not that establish a precedent? Does not that say, once at least, that we do believe that the workers under this "alphabetical noodle soup" are entitled to the regular workmen's compensation? But little by little they pull it away or they confuse it.

I, for one, am tired of legislative lying. I am tired of conflicting constructions, where you do not know in the morning what the law is going to mean in the afternoon. That was always more or less true under our court constructions—until it got to the Supreme Court, and then you could not tell what the Supreme Court meant sometimes, but we could labor through. California, as Mr. Sharkey says, has resolved that nobody is entitled to compensation in work-relief cases. I hope there will be enough workmen's compensation left for a convention next year. If there is, I am going—but I do not believe there will be.

Mr. SINCLAIR (New Brunswick). This is an international convention, and we have questions that may be ironed out by discussion between ourselves. We in Canada naturally think we are a few years ahead of the United States in its workmen's compensation acts; but that relief question is one that naturally hits everybody and every State, or every Province as we call it, and every municipality, I suppose, in America.

We have listened, and personally I have listened with a great deal of pleasure, to a lot of what I would call elementary questions. We have decided them all, and there is no question about what we do in our country as regards these questions. I thought maybe that question of relief might come up tomorrow.

Mr. DEBEL (Minnesota). I understand that the discussion tomorrow is to be divided into two groups, and I should like very much to be in the same group as Mr. Sinclair from New Brunswick. I should like to know how they have solved it to their complete satisfaction in Canada. Perhaps Mr. Sinclair could give us a preview of what he is going to say to the other group.

Mr. SINCLAIR. I shall be pleased to. We have, virtually speaking, just one law in the Dominion of Canada. There is a little difference in how much we pay and how much we do not pay; that is, the percentage. But the boards of the Dominion of Canada are not free. We hear the cases, and we decide whether the man is entitled to compensation or whether he is not, and from that matter of fact there is absolutely no appeal. Nowhere in the Provinces, that I know of, is there any appeal. When it comes to

the question of liability, in the Province of Ontario there is absolutely no appeal. The board decides even questions of law on questions of fact. But in the other Provinces—I think I am fairly right—any question of fact—whether an accident arose out of or during the course of a man's employment—we decide, and having decided it, that is the end of it.

Mr. WRABETZ (Wisconsin). I want to ask Mr. Sharkey when and where his paper will be published.

Mr. SHARKEY. In the next issue of the Monthly Labor Review, published by the Bureau of Labor Statistics.

Mr. DEBEL. I feel that there is a lack of understanding of the limitations under which industrial commissions operate in the application of the workmen's compensation law. Those of us who are lawyers know that our courts, in interpreting and applying the common law, have a very wide latitude. They have far more latitude than many conservative courts and lawyers will admit or acknowledge; and there is no doubt that a court, in interpreting and applying the common law, has the power to develop the common law. Courts do not like to admit that they are capable of making judicial legislation but it is a fact. Do the industrial commissions, in interpreting and applying a statute, have anything like the same latitude or power that the common-law courts have in interpreting and applying the common law? I doubt it; and so it seems to me that it is a field which invites legislation.

According to my notion, the legislation that has been enacted heretofore has been in the wrong direction. I will admit that. But, nevertheless, it is not within the field of legislation, rather than in, well, commission legislation, if you please? We talk about judicial legislation. I am in accord with judicial legislation if it is in the right direction. I think that is the theory, the very nature, of the common law. But I would be a little bit afraid of commission legislation—not that I would not want to see the result, but I am afraid the commissions might lay themselves open to criticism and in that way weaken their usefulness as instrumentalities for carrying on what I like to call the laborers' first substantial installment of the New Deal—his right to compensation, on injury in the work, for loss of earning power.

Mr. STEWART. It seems to me that in these days a commission which does not lay itself open to criticism is of mighty little use.

Mr. PARKS (Massachusetts). I agree with Mr. Stewart. I do not want to let the remarks of the gentleman from Minnesota go unchallenged if he is comparing decisions of members of industrial accident boards with decisions of our common-law courts. I think the members of industrial accident boards are just as well qualified to render decisions in workmen's compensation cases as any of the courts—judicial tribunals, as you call them. The gentleman from Minnesota seems to be fearful that we lay members, so-called, who have been operating for nearly 23 years—at least I have as a member of one of those boards—may injure the workmen's compensation act, and its beneficent principles and its beneficent operation, by seeking to render decisions. I am not fearful of that. I render decisions every day; I give my reasons. We blaze a new path almost every time we render decisions. The decisions of my col-

leagues on the Massachusetts Industrial Accident Board sometimes take up 2, 3, 4, and 5 pages with reasoning on the facts and the law, and I will match them, in our particular field of work, with any judicial decisions.

Personally, I am not afraid of the members on these commissions falling by the wayside or doing anything to cast disgrace upon us. I think the members of industrial accident boards, as I have seen them, and the decisions they have rendered that I have read, have established a new era, if I may call it that, of justice and simplicity and reasoning, and I am rather proud of the part that our board has played in these decisions. When some of the decisions of our board are appealed to our supreme judicial court, very seldom does it disagree with our board; these decisions are rendered by at least one layman on the board, the rest being attorneys. So I do not think there is any fear of members of these lay boards being outdistanced by our established common-law courts.

I think we should fight to keep these compensation laws with the lay boards. I know an amendment is offered in our legislature almost every year that our findings of fact—not the findings of law, which are reviewed, but the findings of fact—be reviewed by superior court judges. I had very great pleasure, when such a bill was up before the committee on judiciary of the Massachusetts Legislature, in saying that I would back the members of our board in intelligence, integrity, and honesty against any member of our superior court, and we have a splendid superior court.

I say these things because of my pride in the members of these boards which administer the workmen's compensation acts. I have never seen men who were more conscientious and who did their work with more care, understanding, and sincerity than the members of these boards. We meet together every year from all over the United States and the Provinces of Canada, and we exchange views, and what a splendid thing that is. It broadens us. We have nothing to be afraid of. The compensation act is safe, as far as administration goes, in the hands of these boards. They will stand the test. I know ours in Massachusetts and every single member of the board will. The decisions they render will compare with any of our common-law courts.

Mr. WALKER (North Dakota). North Dakota is overwhelmingly agricultural. We have very little industrial development. We passed our workmen's compensation law in 1919. That legislature, of which I had the honor to be a member, was overwhelmingly made up of farmers. There were not over 4 representatives of labor in that legislature, and there were not over 5 attorneys. There had been an insurrection in North Dakota—an agricultural insurrection. The agriculturalists there organized politically, and they elected almost the entire legislative body. At that time, there was not one particle of labor legislation on the statute books of North Dakota. That legislature of 1919, composed almost entirely of farmers, wrote upon the statute books the workmen's compensation act, the minimum-wage law for females, the 8-hour law for females, and a mining code, giving to North Dakota some real progressive labor legislation.

The first commission appointed to put into practice the workmen's compensation law had one attorney on it, but that was not fatal be-

cause he was removed for cause before he had been there a great while. The board, as at present organized, is composed of three laymen. I am one of them, and before I went broke I was a farmer and a rancher. I farmed and ranched in North Dakota for 29 years before the game got me. Since then I have had to make my living out of politics. I hope the time will never come when commissions handling workmen's compensation are afraid to make decisions for fear someone will say they are legislating. If our courts have the authority for judicial legislation, I hope we have the authority to legislate in the interest of our injured workmen.

Mr. DEBEL. I think my remarks were very largely misunderstood. I should hate to leave the impression here that the Minnesota commission is not liberally administering the workmen's compensation law, nor inferentially, that we are afraid in our State to make decisions when we are up against the wall. We are not afraid of that. We do not undertake to pass the buck to the supreme court; we do not want to do that. My remarks were not addressed towards disparaging lay boards or lay members as against occupants of our judicial benches. That was not the purpose of my remarks at all. It was simply the question as to whether or not—as your act does not cover the situation—we are somewhat cramped in our style by the fact that we do not have as much elbow room in which to develop the law as the common-law courts have in developing their law? I am well aware that there are many good laymen and many good lawyers sitting on these commissions.

Mr. ANGSTEN (Illinois). I was about to ask you to expatiate a little on what you did mean when you said that the commissions ought not to submit themselves to criticism for commission-made laws. I was not quite sure whether I understood exactly what you meant by that. If "commission-made laws" mean the interpretation of the act in the way that the commission sees fit, and if that same commission were to hesitate once they reached a conclusion because there was no precedent for it, then I should hate to see that time come.

I was appointed in 1913 the first commissioner in Illinois, and at that time there were no precedents. The courts had not spoken on hardly any phase of the compensation law, and if Illinois or any other State at that time had hesitated about putting its interpretation on what was meant by the compensation law, or making compensation law—and that is what it was at that time—for fear of criticism, it might have been a very dangerous practice. I am assuming that my good friend from Minnesota does not mean that, because, necessarily, lay boards and commissions will always be in the advance guard on compensation. It will be some time before the courts catch up to them, because workmen's compensation is only one phase of a court's work, while for compensation boards it is their only work, and they are interpreting the provisions of the act almost every minute of the day. So it is only right and proper for compensation boards to make law and make decisions, and if the courts later on say they have overstepped, well and good, but I would hate to see any commission stop for fear of criticism of any reasonable and proper conclusions at which they might arrive.

Mr. KINGSTON (Ontario). I listened with a little alarm and anxiety at the expression Mr. Stewart made use of—I did not know whether to take him seriously or not—that he thought that inside of a year from now there would not be any compensation boards in the United States. I hope he was just joking, because I doubt if there is any legislature in any State of the United States that would think of proposing a law to abolish the workmen's compensation law of that State. If there is any such idea I am concerned about it, and if any other representative of the various States who is here has a feeling that there is any such move pending, then we might look at the situation with a little anxiety.

Speaking of Canada, the last thing, I am sure, any legislator would think of would be to propose a law to do away with the workmen's compensation law. The manufacturers of our Province, the labor organizations of our Province, are vying with each other to seek to improve the workmen's compensation law, and I am sure the last thing anyone in Ontario, who is thinking about workmen's compensation at all, is thinking about, is to take it off the statute book.

In speaking about the subject that has been raised—the concern of a workmen's compensation commission as to making laws where there is an appeal—there is no occasion to be concerned, because if there is any law which is open to criticism it can be corrected. I recall very well when the law was being passed in Ontario 20 years ago. The commissioner, who was the chief justice of the Province, was preparing the law as a commission appointed by the Prime Minister or the government of the day, and the question was put to him "What about an appeal from these decisions?"

"Well, now", he said "I have given that an awful lot of thought in proposing this law for the Province. I am not going to propose that there shall be any appeal from the decisions of this board in this Province. Of course, it is for the legislature to say, but, so far as I am concerned, I am going to write a law for our Province so there will be no appeal except to the board itself for reconsideration of its own decision, and I hope that that provision for appeal will be given all the latitude that it is possible to give." That has been working in Ontario for 20 years. He said at that time, "Suppose you do provide for an appeal, you naturally will go either to the court of appeals of the Province or to a board of three judges; but are they likely to know any more, are they likely to treat the appeal with any greater element of common sense, than this board that is sitting day and night and considering these questions day in and day out, week in and week out, year in and year out? So far as I am concerned", he said, "I am not going to provide for an appeal."

Now, I am not saying there should not be an appeal. I have been helping to administer the law in Ontario for 20 years, and I am not saying there should be an appeal. There are an abundance of reasons why there should be appeals, and as commissioner I have often wished we did not have a provision for appeals in Ontario, because we are burdened with appeals for reconsideration of our decisions. I think it is an appeal from Philip drunk to Philip sober, and while there is a lot to be said in favor of an appeal, I am not so sure that the old chief justice was not right.

There have been two occasions in our Province since the law was put on the books when attempts were made in the legislature to introduce a provision for appeal into our law, and both employers and workmen—I am speaking now of the official organizations—came forward and said, “No; we are satisfied with the law as it stands in that regard, and we believe that if you introduce an appeal into that law there will be an abuse of the situation by litigation which is going to get you back largely to the position you were in before the law was passed.”

We have been going for 20 years without the appeal. My good friend Mr. Morley, who is here, is very closely associated with our work officially and, looking at the law from the outside, he can tell you whether or not, from the employees' point of view, there is much of an argument or much of an undercurrent of feeling that there should be such a change. I am anticipating that in the session of the legislature to be held next spring in Ontario the subject will come up for discussion and an appeal may possibly be grafted upon our law. But that is the way the situation has been for 20 years. I was much interested by what Mr. Stewart said, but I am really not taking what he said seriously. If I see the situation in Canada aright, I am sure there is no such idea there, and I hope there is none in the States. I will be very much surprised if there is.

Mr. STEWART. It is not necessary to give a list of the States in which bills were introduced during their past sessions to repeal the workmen's compensation laws. I do not think that is the way it is coming. We never did get the powerful labor organizations of this country behind the workmen's compensation law, and you have very little idea how bitter the workers, other than the four railroad brotherhoods, are becoming at the way in which the workmen's compensation law is administered—not so much a criticism of the commissions but of the thing that has grown upon us. Within the last year I have been more than amazed at the feeling of “Let the whole thing go and go back to the old common-law practice.” You do not seem to realize that while you are paying out \$19,000,000 to workmen, you are also paying out \$12,000,000 to doctors and about \$4,500,000 to lawyers.

Mr. KNUTSON (Wisconsin). As I understand these two papers that have been read this afternoon, the concern is with respect to providing some means of protection for relief workers. Mr. Sharkey has clearly pointed out to us in his paper the difference of opinion that exists among the various commissions throughout the United States, as well as among the various supreme courts in the different States. Some commissions have held that these relief workers are entitled to compensation; others have not. The courts have held both ways. It is difficult for me to conceive that there is any person in this room who would attempt to argue that a relief worker is not entitled to some benefits, whether they be compensation benefits or from relief funds, or elsewhere, to take care of him in case of an injury while on the job.

I should like to suggest this as a solution: That three or four men from those States that have taken care of this situation, either by legislation or by executive proclamation of the Governor, be appointed on a committee, subcommittee, or what not, to make recom-

mendations back to this group with respect to some means of protecting relief workers in case of an injury, either by legislation or by executive proclamation.

[This suggestion was seconded.]

Mr. KEENER (Arizona). I think Mr. Stewart was unduly alarmed about the fate of compensation laws. Arizona, a couple of years ago, attempted to repeal the Arizona compensation law. It was put to referendum and the bill to repeal met with overwhelming defeat. That bill was proposed by a group of attorneys who, of course, were not getting their share of the money. Arizona has solved the relief workers' problem to the satisfaction of almost everyone concerned, in that part of the money for relief is diverted to pay the insurance premiums for taking care of injured workmen.

Mr. SUPPGER (Idaho). Most of us have wondered at the fear expressed in this discussion. If there is occasion for alarm over the fate of the workmen's compensation law, those of us who are best acquainted with its workings, those of us who are interested in its success, should get busy with a campaign of education. I say that because I am aware of the trend of which Mr. Stewart spoke a while ago and of which the commissioner from Arizona has spoken just now. There is a well-organized, a definitely organized, movement to repeal the act as it stands and to put the administration of it into the hands of the courts, but that movement emanates from and is sponsored by people who have an interest in putting the administration of the act into the hands of the courts, and therefore I say we should, if such a movement is observed, initiate a campaign of education to offset it.

The subject under discussion seems to have been fully covered by Mr. Angsten. Does it not occur to you that the subject brings up an emergency which has arisen under the compensation law, as to whether or not it shall cover these relief workers? Why was the workmen's compensation law passed in the first place? It was passed to take care of an emergency. Of course, the situation which I term "emergency" has existed for a long time. Everything could not be foreseen at the time of the passage of the law. This is simply a new condition which has arisen, and it is up to this body, I believe, to do what Mr. Knutson has suggested—appoint a committee to draft a proper resolution to take care of the situation or the emergency that has now arisen.

[On being put to a vote, the motion of Mr. Knutson, that a committee of 3 or 5 men, preferably from States which have taken care of the relief problem by legislation or by executive proclamation and are familiar with what they are doing in their States, be appointed—such committee to make recommendations back to the convention as to how to overcome the problem of compensating relief workers—was carried.]

[Later in the convention, Chairman Baker appointed the following members to the committee in question: Chairman, Peter J. Angsten, Illinois; W. H. Debel, Minnesota, and John C. Root, North Carolina.]

Chairman BAKER. We have a very important paper, by Mr. Swen Kjaer, on the "American Remarriage Table."

An American Remarriage Table

By SWEN KJAER, of the United States Bureau of Labor Statistics

At many of the previous conventions of the International Association of Industrial Accident Boards and Commissions a great deal of dissatisfaction had been voiced with the remarriage experience published by the Royal Netherlands Accident Fund, commonly referred to as the Dutch remarriage table, generally used in this country for evaluating compensation benefits to widows and determining reserves.

An attempt was made in 1924 to obtain statistics on this subject from the various States and Provinces. According to a report made to the association in 1927, such information was not available in 16 of the States, and some of the other States were unable to do the clerical work involved.

Through the continuous efforts of former Secretary Ethelbert Stewart a considerable number of schedules sent to the States were obtained and, in accordance with the resolution passed during the Chicago convention in 1933, these were turned over to the Bureau of Labor Statistics for use in developing an American remarriage table.

In sorting the schedules—11,386 in all—it was found that only 4,795 contained sufficient data to construct a workable table.

At about the same time it was learned that an American remarriage table had been compiled and published by the Casualty Actuarial Society, based on data collected by the National Council on Compensation Insurance from its members, from exclusive State funds, and from carriers not affiliated with the national council, located in 31 jurisdictions.

The study was confined to data reported for the policy years 1921 to 1929, inclusive, and the completed tables covered 10,699 cases, more than double the number of cases available in the association study.

The following table shows a summary of the volume of the data which serves as a basis for the calculated remarriage rates.

Remarriage of widows—Summary of volume of exposure

[Source: Proceedings of the Casualty Actuarial Society, May 26, 1933]

Widow's age at husband's death	Number of cases observed	Experience during first 6 years of widowhood		
		Number of remarriages	Exposure (in years)	Average yearly probability of remarriage
16 to 20 years.....	395	145	1,231	0.1178
21 to 25 years.....	1,038	278	3,619	.0768
26 to 30 years.....	1,402	294	4,669	.0630
31 to 35 years.....	1,507	190	5,102	.0372
36 to 40 years.....	1,475	105	5,174	.0203
41 to 45 years.....	1,265	78	4,518	.0173
46 to 50 years.....	1,117	46	3,923	.0117
51 to 55 years.....	910	22	3,462	.0064
56 to 60 years.....	728	16	2,694	.0062
61 to 65 years.....	448	8	1,605	.0053
66 to 70 years.....	260	4	904	.0044
71 to 75 years.....	104	1	339	.0029
Total.....	10,699	1,187	37,040	.0320

Detailed tables prepared from these data were published in the proceedings of the Casualty Actuarial Society, May 26, 1933, volume XIX, part II, under "An American Remarriage Table", by William F. Roeber and Ralph M. Marshall.

It was also learned that the workmen's compensation commission of the State of West Virginia was engaged in compiling its experience of remarriage of widows. As 4,013 of the schedules in the association study had been supplied by West Virginia, it seemed the best policy to abandon the proposed tabulation temporarily, and call the attention of the convention to present conditions.

There cannot be any question about the inadequacy of the Dutch remarriage table. The figures used in this country were presumably taken from either the 1912 tabulation, which covered 6,804 cases, or the 1917 tabulation, which included 7,096 additional cases, a total of 13,900 cases. Revised tables were issued in 1922 and 1927, but, so far as known, the American tables were not revised accordingly. Even if they had been revised to correspond, the factor of variations in customs of the two countries would remain, and the revised tables would still not represent actual conditions here.

The tables published by the Casualty Actuarial Society cannot be considered entirely satisfactory as the data are rather limited, but they probably reflect conditions in the United States more accurately than the Dutch tables. If the actual conditions vary from those portrayed in the tables, the results are either inadequate reserves which jeopardize the security of compensation of the widow, or excessive reserves which would require industry to pay higher premium rates than necessary and would be reflected in the production costs. The two compilations do not agree. It is mentioned in the report of the actuarial society that reserves set up according to the American table will be greater than the reserves depending upon the Dutch table for ages under 34 and less for ages over 34. A table based on American experience should by all means be established.

[Mr. Kjaer made a motion that "we should have a table that reflects the American experience", which was seconded and carried.]

DISCUSSION

Mr. FONDILLER (New York). Just a word of explanation regarding a question raised by Mr. Kjaer in his paper as to whether the remarriage figures adopted from the Royal Dutch Insurance Institution were taken from the 1912 or the 1917 tabulation. It so happens that when these calculations were made, nearly 20 years ago, I was assistant actuary of the New York State Workmen's Compensation Commission and had the privilege of taking an active part in the construction of the reserve tables from the remarriage figures adopted at that time. I am able, therefore, to state that the remarriage figures employed in the calculations were taken from the 1912 tabulation and that the 1917 tabulation was not then available. Later, in 1923, when the schedule of benefits under the New York law was amended so that the benefits to surviving orphans were increased upon remarriage of the widow, as well as upon her death, it became necessary to construct new reserve tables for evaluating benefits to surviving widows and orphans.

It was again my privilege to take an active part in these calculations, this work being performed by my own actuarial firm, and published as Bulletin No. 120 by the New York State Department of Labor. These later calculations were based on the same remarriage figures as were used in the construction of the original reserve tables. The basis of the reserves to be set up under the New York workmen's compensation law was incorporated in the law on July 1, 1917, and has not since been changed. Hence, there was no choice in 1923 as to what remarriage figures should be employed in constructing the new reserve tables.

It is recognized that 10,000 widows (radix of the American Remarriage Table) is not a large exposure, but it represents a sizable portion of the remarriage experience available in this country among widows of industrial workers, and it was published for what it was worth.

It should be noted that the American Remarriage Table recently published (proceedings of the Casualty Actuarial Society, vol. XIX, p. 279) does not, in itself, enable one to compute directly the value of the benefits to the surviving widow and orphans. The table merely discloses the rate of remarriage at each age of widows and it is necessary to combine these rates with the rate of mortality and the rate of interest, together with the schedule of benefits and limitations provided under the particular law. It is from such a calculation that there finally emerges reserve tables similar to those constructed nearly 20 years ago and later revised in 1923 for the evaluation of benefits under the New York law. Reserve tables of this kind have not yet been constructed on the basis of the American Remarriage Table.

Chairman BAKER. Are there any further remarks or any other contributions to be made to this subject?

Mr. KINGSTON (Ontario). I did not get the significance of the full paper, but I have been hoping for a long time that among the compensation boards of the United States and Canada we could get a reliable table of mortality, including also the element of remarriage, which would embody the experience of 20 years. We have been going now for practically 20 years, in all jurisdictions in Canada and the United States, and we have all been using the American Experience Table of Mortality to a large extent, I think, and for the purpose of the remarriage feature we have been using this Dutch table. The Dutch table has been in use in Canada since I started in 1914, so it must be the table of 1912 that is used. I do not know whether the experience of the large element of colored workers in the South should enter into such a table—I think the insurance companies might have something to say about that—but if we were to deal with that zone running through the middle of the United States from east to west and include such experience as has been gathered in New York, we would have sufficient to make a table. Is that the significance of Mr. Kjaer's paper?

Mr. KJAER. Not quite that, but it has proved one thing, that you cannot get information from the different States, even from Ontario, which sent in word that it did not have the clerical help to compile the information and make the table. That was the report from most of the States. For instance:

Alabama, lack of funds.

California, no deductions made.

Georgia, a number of promises which so far have not materialized.

Indiana, has records but unable to do the work.

Kansas, has not said anything since the time it changed administration, and did not have any records then.

Louisiana, no clerical help.

Maine, unable to do the work.

Maryland, promised as soon as possible but not received.

Michigan, does not compile statistics; it does insure but there are no statistics available.

Minnesota, promised at an early date.

Montana, lack of funds prevent.

Nebraska, staff too limited, use of the files offered if we send somebody there to compile the data.

New Hampshire, unable to do the work.

New York, undertook compilation but did not have time and was unable to do the work.

North Dakota, experience too limited; furnished some but said experience was too limited to amount to anything.

Ohio, last word sent in was in 1927, when it had more than 2,500 cases but no office force for compiling.

Oklahoma, of course, has no records.

Pennsylvania has been sending some data in, but through some mistake the age of the husband has been given instead of the age of the widow, the basis on which all information is compiled, so they were useless; a little over 500 were good and about 6,000 were no good.

Ontario, records but unable to do the work.

Mr. KINGSTON. To whom did you write in Ontario?

Mr. KJAER. I do not know. Mr. Stewart wrote at that time, as secretary. That was his report.

Tennessee, office force too limited.

Utah, promised at an early date; I found some from Utah but could not get the age of the widows.

Vermont, promised as soon as possible but none in the records.

Virginia, did not start to compile information until 1925.

Washington, used the Dutch table; there has been a change there and it might be possible to get some now.

West Virginia has compiled the information and has tabulated it.

We have the West Virginia information, but in view of the fact that its actuary had compiled most of the information, I could see no use in going ahead and doing that extra work.

I thought some argument might be started here at this convention that would end in making a change in the forms. Some of those earlier records are no good, and in some places the boards may not be able to go back through the records and compile them. When this study was first started it was intended to cover some of the war period. The insurance companies took occasion between 1921 and 1929 to get away from the actual war period to a more normal period. They have a little over 10,000 exposures, and they can get, through their agents, a continuous study from all the insurance companies. If we combine with them and also utilize what we get from compensation commissioners, beginning at this date for instance, making a compilation of both and eliminating the duplications, we shall be able to get a bigger exposure in a shorter time and make something available for study.

Mr. KINGSTON. How many cases would you need in order to make a reliable table, in your judgment?

Mr. KJAER. I will ask Mr. Richardson to answer that question. He has been very active in this matter.

Mr. RICHARDSON (New York). I would say that 10,000 would be a fair measure.

Mr. KJAER. Ten thousand was the size of the National Council study.

Mr. RICHARDSON. However, it would seem better to use 10,000 cases taken from American experience than to use the antiquated Dutch experience, which reflect conditions that do not obtain in North America. I imagine that better actuarial men would say that probably 10,000 cases, where you have to divide them into a number of different subdivisions, would represent fairly limited exposure. On the other hand, it does seem to me that anything we could get with any degree of authority from American experience might be more satisfactory than experience taken from some foreign country where the conditions, perhaps, are quite different from those here.

Mr. KINGSTON. The American Experience Table is based upon insured lives, is it not, and of course, you must say insurable lives?

Mr. RICHARDSON. It is based on compensation cases.

Mr. KINGSTON. Which, the American Experience Table or the Dutch?

Mr. FONDILLER. The American Experience Table of Mortality is based upon insured lives which were medically examined at the time of being insured by the Mutual Life Insurance Co. of New York. The table is quite old (1868) and in spite of being based on a group of medically selected lives, it shows rates of mortality quite high as compared with rates now experienced by life insurance companies on recent business, particularly at the younger ages. In workmen's compensation, however, we are dealing with widows from the general population and without medical examination. The mortality rates shown by the United States Life Tables for white females are based on census returns and represent general population mortality without selection by medical examination; this appears to be appropriate for the purpose at hand.

With regard to the number of lives required to furnish an adequate basis for the construction of a remarriage table, it is not so much the number of widows that is important, as the number of years of exposure. The 10,000 widows in the experience of the American Remarriage Table represented an exposure of 37,000 years. This is an average of only 3.7 years per widow and hence represents remarriage experience primarily during the early years of widowhood. Offhand, I should say that 100,000 years of exposure, with a sizable portion of the experience in the later years of widowhood, would give a fairly dependable basis.

A still larger experience would permit the construction of separate tables for white and colored lives and for certain selected industries (such as coal mining) where the rate of remarriage, as in the West Virginia and Pennsylvania mining districts, is known to be distinctly high. This was brought out in 1922 as respects Pennsylvania in a well-known paper (Proceedings of the Casualty Actuarial Society, vol. VIII, p. 201) by the late Mr. E. H. Downey

of the Pennsylvania Insurance Department. In analyzing the basis data, it is important to consider whether an undue proportion of the experience occurred during periods of economic depression, when the rates of remarriage are lower than during normal times.

Mr. KINGSTON. May I ask another question? Just leave out the Dutch remarriage table, or any other table, and take the American Experience Table of Mortality, as we are using that. We know that is an insurance table based upon insured lives. We apply that to workmen's compensation and leave the remarriage-of-widows element out of the picture.

Is it not obvious that there is an unwarranted application of mortality experience on insured lives to establish mortality expectancy of widows and impaired workmen where you are creating a pension; you have widows, many of them probably not insurable at all, and injured workmen, many of them by the very nature of the injury seriously impaired? And so I am questioning in my own mind, is not the American Experience Table of Mortality in many respects faulty from the point of view of the consideration which compensation boards are giving it?

Mr. FONDILLER. Yes; because the American Experience Table of Mortality shows a lower rate of mortality than these special groups, which consist of impaired lives or not medically examined lives. Therefore, claim reserves on this mortality table will be higher than on a table based upon impaired or substandard lives. What you are driving at, I presume, is, how would it affect the dollars you have set up in your liabilities?

Mr. KINGSTON. That is it.

Mr. FONDILLER. If you are required to set up those dollars on the American experience table, then the premium rates will be affected upward more than by the use of some table that more closely approximates actual mortality. Is that a definite answer?

Mr. KINGSTON. Yes.

Mr. HARTWIG. I will undertake, when I go back to the State of Oregon, to get our experience with remarriages and any other experience you may want for a limited time back. I realize the problem that all commissions are confronted with, ours along with others, but I will undertake to get that information and see that it is kept up from now on, because that happens to be my department. I will be glad to do that, and if you have regular forms that we can use we shall be glad to use them.

Dr. BALDWIN (Washington, D. C.). This paper by Mr. Kjaer is the result of a recommendation that was made in my annual report. I knew that the Bureau of Labor Statistics had a large number of schedules. Supposedly, there was not adequate information for this purpose, and we felt that probably 20,000 cases would be sufficient as a basis for computing a table. This association notified the Bureau of Labor Statistics to go ahead and compile that table, but when Mr. Kjaer took that matter up he found the defects he has already stated.

The reason that the Bureau of Labor Statistics had these schedules was that a suggestion was made by this association a good many years ago that the compensation commissions should furnish that

information to the Bureau of Labor Statistics, and on the strength of that recommendation Mr. Stewart wrote to all the commissions to furnish the information. They readily promised to do so, and a good many of them did furnish the schedules, but they did not furnish complete enough information to make the data worth anything. Unless you are going to furnish the information that is necessary to compile this table you may as well not try to do it. If the other commissions will just do that, you can readily get a sufficient number of cases, and if you do, the Bureau of Labor Statistics will compile this table for you.

It seems to me that is the thing to do. Mr. Kjaer recommends that this other table be adopted—why? Not because he believes it is perfect or satisfactory, but because it is better than anything we have. The Dutch table has become unsatisfactory, and if the commissions will do what they promised to do sometime ago, it will not be very long until we have a large enough field of information to compile an adequate table. That is what I hope you will all do.

Mr. HARTWIG. The point I wanted to make was that I rather sense that when this request for information came to the various commissions, they were expected to go back in the history of their acts, probably to the time when their act began. That would mean a lot of work, and they would not have the help; but if we start in now and go back a year or so, I think that can be done without any difficulty, and I will undertake to do it for Oregon.

Mr. KJAER. In that case the form should be changed from the form that was adopted. The form that was used by the insurance companies does not carry all the information that should be accumulated.

Chairman BAKER. What form do you mean?

Mr. KJAER. The form for collecting the information. The schedule sent out to get the information was one with questions that should be on there but which were not on all forms.

Chairman BAKER. We are back to the question of remarriage.

Mr. KJAER. In looking this up I find that the Dutch table, if it is the 1912 table that has been used, has a total of only 6,804 cases, and that is an accumulation for 10 years. It now has 21,000 cases, but we have never made any changes.

[Meeting adjourned.]

TUESDAY, SEPTEMBER 25—MORNING SESSION

Section A—Problems of Exclusive State Fund Jurisdictions

Chairman, FRED W. ARMSTRONG, Vice Chairman Workmen's Compensation Board of
Nova Scotia

ROUND-TABLE DISCUSSION

[At the suggestion of the chairman each man present stated his name and the section he represented.]

Chairman ARMSTRONG. This is a round-table discussion. I will say something in regard to assessments, to open the meeting, and then everybody can feel free to speak on this subject and to bring up any other subject.

The first problem, and a continuing one, of an exclusive State fund is to have money to pay claims. It is therefore necessary that assessments should be made in some form so as to enable the board to have funds in hand at any time to pay claims. According to our act and the acts of many of the other jurisdictions, assessments can be made in different forms, but practically all jurisdictions follow the line that assessments are made on the total pay roll at a fixed rate on every hundred dollars of wages paid to workmen. The collecting of assessments is, therefore, of vital importance, and I thought it might be well for the members of the association who are present here today to consider whether we can learn something from each other as to the way we face this problem.

I have prepared some copies of assessments as practiced in the jurisdiction which I represent and am handing them to the different representatives so that they may look them over and ask any questions they may deem necessary. The discussion, I have no doubt, will become general in regard to the forms laid before you.

One of the things in the acts of the Canadian Provinces which appears to be different from the acts in the American States is that in all cases where over a certain number of men are employed the workman is insured, even if the employer has not reported to the board and has therefore not paid any money into the board. The idea back of this seems to be that the workman should be protected if he is working for an employer who employs a reasonable number of workmen. This, of course, is specified either in the act itself or in the regulations of the different boards.

Because boards have to pay claims where employers have not reported and have not paid assessments, it becomes necessary that the boards should be given arbitrary powers in the way of collecting assessments from employers of this type. Besides the penalties which may attach because he has not reported or paid his assessment, the defaulting employer is liable for the cost of any accident which happens during his default.

[At this point Chairman Armstrong passed around and explained some of the various forms he had prepared.]

Of course, it is essential that, where we have to pay claims where employers have not reported, we must have power to collect our money in the easiest way possible. Under our act all that is necessary for the board to do is to make out a certificate that such a man owes us a certain amount of money. This is taken up to the prothonotary office, and it constitutes a judgment just the same as if we had gone into court and gotten a judgment in the ordinary way before a judge of our supreme or county court. The board-order form here is another way we have of getting after the person who does not report his operations. That is, where he has an accident, we issue a board order and collect it just the same as we do the assessment for the cost of the accident which happened before he reported his operations to the board.

These others are forms for adjustments of the pay rolls and speak for themselves. It is not necessary to go into detail about them.

Another point is that where the employer is not an incorporated company we do not cover the employer or members of his family unless a special application is made on form no. 111; we have a form for getting his physical condition and if he has good vision, and things like that, so as to see if he is a good risk.

The meeting is now open, and we will start with Mr. Kingston.

Mr. KINGSTON (Ontario). The first problem that is purely an exclusive State fund problem is, of course, the problem of getting the funds. The gentlemen who are engaged in the administration of what we call an "insurance act"—the insurance type of legislation—have nothing to do with the finding of the money with which to pay the claims. We have all that they have to do in the way of administering the act as to accidents that have happened, finding the amount of compensation to which a workman is entitled, and consideration and reconsideration of all of the incidents that arise out of an accident. Then, from the point of view of a pure State fund administrator, we look at the other fellows and say, "What a simple job you have. All you say to the insurance company or to the employer, who possibly is the mouthpiece for the insurance company, is to pay this claim and we wash our hands of it." But the exclusive State fund administrator has to go farther and have all the responsibility of getting the fund.

It is surprising what an enormous number of problems arise out of the getting in of the money. I have no doubt that those of us here, who are all in the exclusive State fund system so to speak, will bear me out in what I say, that that is the big problem.

Let me say here that there is a difference, as I understand it, between the system in Ohio and our exclusive State fund system. In most of the Canadian Provinces the situation is that we must assess the employers, as Mr. Armstrong has said, get the money, and pay the compensation that the board orders out of the fund that we have collected. We must pay that compensation whether we collect the money or not. If a man is hurt in the backwoods some place, in an industry that is under the act, the employers may never have heard of the act, but if that industry, when the injury comes to light, is under the act, that man must get compensation. That would not be so in Ohio, as I understand the situation.

Mr. GREGORY (Ohio). That is partially true.

Mr. KINGSTON. That was not always so, but a change has been made. There must be an application—or at least it was once so—by an employer for a coverage by your board. Was that not the case?

Mr. GREGORY. At the outset the nonconforming employers were not covered, and the injured workmen were not entitled to receive compensation.

Mr. KINGSTON. Has there been a change?

Mr. GREGORY. Yes; in some respects.

Mr. KINGSTON. So that an injured workman in an industry not under the act, as we speak of it, is not entitled to compensation in Ohio in all cases?

Mr. GREGORY. In the first place, the commission makes a finding that the employer is amenable to the law, and then if the claim is one of merit, it makes an award. If that award is reduced to judgment against the employer, the claimant is entitled to compensation out of the fund, whether we collect from the employer or not.

Mr. KINGSTON. I am glad to know that that change has been made, because we have often compared our law with the Ohio law. Our law was based originally to some extent on the Ohio law, but that change, that provision, in the Ohio law was not incorporated into the Ontario law. We went further than that and said that the employee must get compensation in every case of accident happening in an industry that is under the act, if the accident happened in the course of employment and as a result of employment.

The problem, as I say, is to get the funds in. I suppose half of our staff is engaged in that side of the work, in getting in the money to pay the compensation that is ordered by the board, on what you might call the accident side of the administration. That means that we have to get a list of all the employers doing business in the Province or in the State. After we have gotten the list of employers, then we must get the pay-roll returns in. Mr. Armstrong has referred to the great number of forms that are necessary in order to get that information. Our practice in that regard is that just before the end of each year we send out to every employer throughout the Province whose name we can get—we have about 25,000 of these firms—form letters with instructions to make the return, and that it must be in by the 20th of January.

The form letters come in, and we have considered the problem of what will happen if the form letters are not in promptly. It seems to be a necessary evil in all of our work that we must provide certain penalties. Personally, I do not like penalties if they can be avoided, but it seems necessary to make a provision that if an employer does not get his pay roll in promptly he must be penalized. I should like to know what the experience of some of the other jurisdictions is in regard to penalties—whether, if penalties were softened, we could accomplish our work, because, after all, the main purpose of a penalty is to insure that our forms will be in and that the information will be gathered which will enable us to make an assessment and get in our money. Of course we ought to get it without a pen-

alty, but we charge a penalty of 5 percent, with a maximum of \$500, to a firm that does not get its pay roll in on or before the 20th of January. In a few cases a substantial penalty had to be imposed.

Mr. SINCLAIR (New Brunswick). Is that 5 percent on the actual assessment?

Mr. KINGSTON. Five percent on the actual assessment, yes. If the assessment was \$100, the penalty would be \$5. If the assessment was \$10,000, the penalty would be \$500, but if it was \$20,000, it would be no more than \$500. That is the situation we have been working under.

The grouping of employers for the purpose of classification is a very large problem, and I take it that in all the State fund jurisdictions this problem is practically the same. We have studied with a great deal of interest and satisfaction the system of classification and grouping of employers for the purpose of rating which Ohio publishes. One of the exclusive State fund problems is subgrouping of employers for the purpose of rating. In this respect we have classes and subclasses. Then comes the consideration of the hazards. Not all of the operations within one group or within one class have the same hazard, so perhaps within one class we have a dozen different subgroups, and each subgroup has a rate applicable to what we consider the hazard of that particular subgroup. And then come the rates for these great varieties of hazards that we find exist.

Then the assessment, made up in accordance with the hazard, must go out. When we send out a notice of an assessment, we give a month in which to pay, and if it has not been paid within a month, there is a penalty. So we have two sets of penalties—a penalty for not reporting the pay roll and another penalty for not paying the assessment when it is due. The penalty for not paying the assessment, for allowing 1 month, 2 months, or 3 months to elapse, is 5 percent if it is not paid within the month, and then 1 percent per month after that; that is, if the employer allows the default to accumulate, but we make a small provision for a few days of grace.

In connection with getting in the pay-roll return, I might say that if an employer comes to us and says that he has great difficulty in getting his returns together and wants another 2 weeks or 3 weeks to get his returns in, we always grant that time without hesitation; but if he simply goes along and pays no attention to the request for information—just allows the time to go by without any request for an extension of time to get the return in—then the penalty attaches. We have no argument with him if he says that he wants additional time; we give that time to him without question.

Then we have the matter I spoke of at first, the payment of the costs of an accident to a workman whose employer has not reported his operations to the board. We have a provision in our law which has imposed a very heavy burden on some employers. I do not know whether all jurisdictions have such a provision or not, but we have the right to impose the whole cost of the accident on the defaulting employer. The man gets his compensation; as I say, it may be \$5 or \$500, or \$5,000.

We had a case just a short time ago where a man had been under the act, and had been paying his assessments regularly for years. Business got bad with him, and at the beginning of this year he said,

"I will not bother making any return. I haven't got any work on hand and don't expect any work. It is no good putting in my pay roll again because I have nothing to pay a return on."

Sometime during the month of June he got a little job plastering a house which he and his son had been working on together. He had to take on one extra man on the job of plastering this particular house. Unfortunately the man fell from a scaffolding and was killed. We had to make an order against that unfortunate employer, and if the order is enforced it will take everything he has, and will even take his home from him. It puts him in a very embarrassing position. Here was an employer who had been in good standing with the board for years and who had been paying his assessments regularly, but he made a slip. The widow of the unfortunate man who was killed must get compensation, and the problem now is for the board to collect that money.

Mr. SINCLAIR. You would not enforce that provision in a case like that, would you?

Mr. KINGSTON. Well, we have sometimes tempered it in those cases. If it is only a small amount, we ask for the full amount. If it is under \$100, then we ask the defaulting employer to pay the full amount; he must pay the full amount if he can. Of course, you cannot get blood out of a stone. Most of the defaulting employers are unfortunate employers who have very little, so that it is not always that we are successful in getting from the employer the amount of money represented by the compensation to his injured workmen under such circumstances. If the amount is large, \$4,000 or \$5,000, we are in the habit of saying to the employer, "Well, we are not going to impose the whole burden on you, but we are going to go 50-50 with you. The board will pay half and we expect you to pay half." Sometimes we have to temper that further. The point is, we must look at the situation and find out exactly how much the traffic will stand. That is a question we have to ask ourselves, and sometimes, even if we find it is possible to get only 25 percent or even 10 percent, where the amount is substantial and the chances of getting anything are comparatively remote, we have to do what good business judgment suggests, and we do not put the screws on tightly. We try to avoid taking a man's home from him, and we try to avoid putting a man absolutely out of business.

Mr. GREGORY. I should like to ask a question. What method do you pursue in order to keep fly-by-night employers from fooling you all the time under those circumstances?

Mr. KINGSTON. We have audit officers going around the country all the time. They cannot be on every man's doorstep every morning, of course, and I realize that it is possible for many employers to get away with small jobs and that we may never hear of them. It is possible that they do get away with them if there are no accidents. If we find these employers later, we then ask them what business they have carried on the last year or two. If we find they have actually carried on a business, we make them report, and then they pay not only the assessment that they should pay, but also the penalty for not having reported. We make the best of the situation that way.

Mr. GREGORY. Do you have a criminal provision where there is a willful violation?

Mr. KINGSTON. We have one in the act but we have never sought to enforce it. There is a provision that a man may be fined not less than \$50, I think, nor more than \$500, and that fine may be imposed by a local magistrate. We also have ample provision in our act for imposing certain penalties, and we have found that it is far more satisfactory to use the provisions in our act for imposing the penalties than to take a man before a magistrate of the court. We did once go to a magistrate court seeking the remedy which the act provides for default, but on that occasion we found the magistrate was not very sympathetic, and we never went to a magistrate after that. So now we use only the provision in our act for added assessments for delay in making payments, and it is much more satisfactory than seeking a remedy in the magistrate court.

Chairman ARMSTRONG. Mr. Walker, will you give us your views on this matter?

Mr. WALKER (North Dakota). There has been a real problem with us during this period of drought and depression. Industries necessarily suffered along with agriculture out in our State, but during the past year we have made a particular drive to get in assessments and liquidate some old accounts that had been standing for several years. We took rather drastic action in some cases. We started pretty nearly a year ago. I took an attorney and went to one city where some lignite coal operators had operated for several years without paying their assessments, which was very unfair competition to those who were paying assessments. We not only garnisheed bank accounts in two towns simultaneously, but also served garnishments on the city where one of them had the contract for supplying the city with coal and on a normal school where another one had a contract. We brought these gentlemen to us after that. They came with a proposition to put themselves in good standing, which was the end sought for. Although it was impossible for them to pick up all of the old accounts, we entered into a stipulation with them whereby they would be put in good standing and we would give them an opportunity to pay up their arrears in installments. We went further than that. Where they could give us evidence that they had paid an injured employee, paid his doctor's bills, paid his hospital bills, we credited them with that. That our drive for collecting funds has been quite successful is evidenced by the fact that we got through this year without the necessity of borrowing, as we had to do last year, and we now have a very substantial balance on hand.

I was interested in Mr. Kingston's disclosure about paying the injured workmen where the employer had not provided for compensation. We do not do that. We make an award against the employer, but that necessitates the injured employee getting his money by virtue of an execution against the assets of the employer, if he has any. It is very unsatisfactory. I am glad to get the information that Ohio and Ontario have adopted that plan, and I hope that we can get an amendment so that we can do something of that sort, because there are some very tragic cases of accidents where the employer has not provided compensation.

However, in our State, when an employer has at some time made application and carries compensation, and an accident happens, although he may not be in good standing, if he pays up what he owes the bureau and puts himself in good standing, then we assume liability in that case.

Mr. MORGAN (Wyoming). I have listened with a great deal of interest to Mr. Kingston. He has covered our situation pretty well as to the collection of funds to pay these claims. That is our trouble, only we are just a little worse off than Ontario. We do not have anything to say as to the amount of the award. The district courts of our State make the awards and it is up to us to have the money to pay them. But we have not had much trouble. We are going along fairly well. The only penalty we have, if you wish to call it that, is where the employer has not complied with the act. We can go back on him for the amount of the award made by the district court.

Mr. KINGSTON. What success have you had in getting it?

Mr. MORGAN. Fairly good success. We have had no large claims to make, and we have had some success in this way, that it has brought a good many of them in on time since that clause was put in the law. Our premiums are collected each month from the employer. He is obliged to submit his pay roll for the month on the 15th of the following month, together with his draft covering that payment. We keep an inspector on the road the year round; he audits these pay rolls and calls on the employers regularly, and we have found that has been a great help to us.

Mr. KINGSTON. Do you make an assessment each month on receipt of that return?

Mr. MORGAN. No; the employer has to submit the pay roll.

Chairman ARMSTRONG. Just like the income tax.

Mr. MORGAN. And with the amount of the premium, 1½ percent. In a case where an employer has a claim that overdraws his account, then his premium automatically goes to 4 percent until that overdraft is wiped out.

Mr. SINCLAIR. Do you have the same rates for every industry?

Mr. MORGAN. That is one fault of our law—the same rate for every industry. Of course, you understand, in Wyoming we do not have very much industry, that is, industry is not so diversified. Our main industries are coal mining and the oil industry.

Chairman ARMSTRONG. Now we will hear from Mr. Gregory, chairman of the Ohio board.

Mr. GREGORY. I think you have touched upon the main point of State funds when you talk about the collecting of assessments. Mr. Stewart was saying yesterday that unless the advocates of workmen's insurance look out they may see the whole scheme destroyed. I think the greatest danger comes from those for whose benefit it was created. I do not know whether you in Canada are experiencing this or not, but here in the States, in these times, we are all taking on that attitude that is common to the Scotchman—being liberal with the other fellow's money. The appeal is made today, "Why don't you take care of claims?" You will find employers making

that appeal, even though they are in default in the payment of their assessments. They figure that here is an unfortunate man, and they encourage him having his attention directed elsewhere so as to ease their consciences. Yet you cannot meet these excessive demands continually without having money. I should like to inquire what has been the experience in Canada as to the amount of shortage due to the nonconforming employer. What has been your experience with that?

Mr. KINGSTON. Well, of course we try to reduce the nonconforming employer to a minimum. If we hear of him, he soon becomes a complying employer. The problem is not a big one. It is big in the individual case when we get him, but that problem is applicable to only a comparatively few, and in most cases, comparatively small employers—the small type of employers. As I say, it is a problem in the individual case, and it sometimes imposes a hardship when we seek to enforce it, but the great mass of employers in our Province are very anxious to comply with the law, and we have no difficulty with the big people.

Chairman ARMSTRONG. Does that answer the question?

Mr. GREGORY. Partially; yes. The experience we are having in Ohio is this: We do not, as a rule, have so much trouble with the large employer who is substantially set up in business and going continuously, but it is the small business enterprises like restaurants, junk dealers, and men who are small contractors who shift from place to place. A contractor may obtain a contract for a job. It may be of considerable proportions, but possibly it is the only contract he will have in that locality. He may shift again to another locality, maybe in another State, yet he leaves a trail of wreckage behind him—human wreckage. It is in keeping up with that class of employers that we are having trouble in Ohio.

Chairman ARMSTRONG. In contracting, we hold the principal responsible, the same as the contracting employer. Do you get that? If a man lets a contract to one of these fly-by-night building contractors, he becomes liable for the assessment; that is, the principal becomes liable for the assessment if the contractor does not pay. That is the law in Nova Scotia.

Mr. GREGORY. That is a very good law. We have been a little bit sensitive in Ohio, and I think in some of the other States, about going that far. Does that apply in all cases?

Chairman ARMSTRONG. The principal is responsible in all cases for the contractor's assessment. We have even gone so far that when a principal lets a contract to a man, he is by law supposed to report it to the board. If he does not report it to the board, and the contractor hires men and there is an accident, we will perhaps make a joint assessment on the principal and on the contractor, and hold him responsible for the cost of that accident. I might say that we use the cost of the accident as a penalty up to \$50 only. We have never charged any employer more than \$50 for a penalty.

Mr. KINGSTON. For a noncompliance?

Chairman ARMSTRONG. No; but for the cost of an accident, we have never gone over \$50.

Mr. KINGSTON. Even if it goes over \$4,000?

Chairman ARMSTRONG. Yes.

Mr. GREGORY. Then your charge there is based primarily upon what the premium would be?

Chairman ARMSTRONG. No; we charge the employer the premium as well, but we charge only up to \$50, and we do not have to go to the courts to recover that. We can make that as an assessment up to \$50.

Mr. GREGORY. Does that apply to small principals? For instance, a person desiring to build a house enters into a contract with a contractor to erect that house. Does that apply in a case like that?

Chairman ARMSTRONG. Yes.

Mr. MORGAN. It does in our State, too.

Chairman ARMSTRONG. You mention restaurant people and the small contractors. In Nova Scotia we have a limit on the number of employees; that is, by regulation there must be more than four employees. If the employer has not reported, he becomes liable to pay compensation.

Mr. GREGORY. You mean he must have four employees?

Chairman ARMSTRONG. More than 4 employees, that means 5. But we do not take restaurant people, or general stores, or things like that. A lot of junk dealers are not under our act at all; we have excluded them.

Mr. KINGSTON. Does that number limit apply to all industries?

Chairman ARMSTRONG. Yes; but we have this proviso, that we can assess a man if he has 2 or 3 employees, and if he is a continuing employer we will assess and put him under the act if he has only 3. But if he has not reported he does not become liable, or we do not have to pay compensation, unless he has over four men employed. Is that clear?

Mr. GREGORY. Yes; I get your point. Such a plan has been advocated in the past. Especially in Ohio, I think, they have been a little sensitive about going that far, but possibly your limitation would help some. It has been urged at times that the principal with whom the contractor engages should be held responsible for the total loss in the event of an accident. Possibly you have softened that some, and that may have helped. That is one of the big problems as we see it here in the States, how to make the employers respond to their just obligations. The last 4 or 5 years have brought that out into the open. Many of us have been living by the grace of God for some time; we in Ohio are running somewhat on that basis, and the Lord has been very good to us. I am interested in learning of your way of handling it, as that is one of the real problems that we are confronted with here.

Chairman ARMSTRONG. Mr. Evans, do you wish to say anything now?

Mr. EVANS (Ohio). I will just answer this specific question of how we take care of penalties on employers who fail to report or fail to pay. Of course, during recent years that has come to be a real problem. As to employers whom we have covered but who fail to make a report of their actual pay roll, if the pay roll is not in within 30 days we place a 10-percent penalty, and this penalty is unlimited. The next thing is paying the premium promptly on receipt of the billing. We

impose the same penalty of 10-percent increase in the premium. So that if an employer fails to make his report promptly and we have to send a man after it, and then the employer fails to pay and we have to go after that, he will pay a 20-percent penalty—10 for failure to report and 10 for failure to pay.

Mr. KINGSTON. If, after a default is made and you are in a position to enforce that 10 percent, you find, perhaps, that the delay was due to some inadvertence of a clerk, is there any provision in your law, Mr. Evans, which enables the officials of the board to soften that penalty?

Mr. EVANS. When we started out we made that penalty the rule of the commission, and it was later written into the statutes. Conditions do develop that are the result of departmental procedure—some breakdown in our own organization—and, of course, we do not hold the employer responsible for that. We have to be very strict in regard to the rules or the provisions of the statute, because almost every employer will have some extenuating circumstances. We are very strict in applying the penalty.

There is one question, or really two questions, that I wanted to ask in connection with premiums. I should like to ask whether or not any of the jurisdictions have had any experience in, or felt any occasion for, using a base other than the pay roll in developing premiums; that is, using a per capita basis, such as is being used, or has been used, by private carriers on window washers or businesses like the demolition of buildings, where it becomes extremely difficult in a lot of instances actually to get the pay roll. For instance, take the case of a demolition employer who in the process of his business collects cash—petty cash. He sells material right on the job, and he is in a position where he can pay his men in cash. It never becomes a matter of record, making it extremely difficult, even with the most exacting audits, to determine what the actual pay roll is for that particular establishment. We have never used anything but pay roll as a basis, and I question whether we can do it without legislative change, due to the wording of our act.

Mr. PERKINS (Indiana). What do you do with window washers and wreckers?

Mr. EVANS. We use the pay roll as the base and endeavor to get all the pay rolls.

Mr. KINGSTON. Have you come up against this problem yet? I mention it because we have in Ontario. Within the last year we have undertaken, in quite a few instances, a more intensive audit, running back over a period of 4 or 5 years, to determine whether or not we were getting the full pay roll. We took, for example, the firm of A., B. & Co. We have a list of accidents that were charged up in the card index to that particular firm. We have instructed our auditors to go through that pay roll to see if the name of every man who had met with an accident was on the pay roll as reported to the board. You would be surprised at the number of cases we find where we have paid accident costs and the man never was on the pay roll, as reported to the board, at all. Where we have discovered that, we have imposed the cost of the accident; that is, we have said, "There is an accident here that we paid the cost on. You haven't reported that man's wages in your

pay roll. That cost us a thousand dollars, and we are going to ask you to pay it." I wondered if you had any such experience, because I suggest it to you as a possible source of finding out something.

Mr. EVANS. Well, being quite an intensely industrial State, we get a fair cross section, I guess, of all kinds of individuals in business. We have made just such a check as you speak of, and have found instances where the pay of the employee who was injured had not been included in the pay roll that the employer reported. We have taken drastic action in some of those instances, and have made examples out of such individuals. We have also found this: We have checked employers as to their accidents and found every employee who had been injured on the pay roll as reported, but a further check disclosed that the employer was very careful to include in the pay roll the employees who were hurt but left out of the pay roll the employees who were not hurt; that is, he looked ahead and suspected the possibility that we might check up on that angle. So we have found in making an audit that not only is it advisable to audit from your own accident-cost standpoint, but also that you must go sufficiently into the employer's business to find out whether or not there is a normal relationship of pay roll to labor cost, that it is similar to what actually would be found in that particular type of business, in order to make sure that you are getting all of the pay roll.

Chairman ARMSTRONG. We have had the same thing happen in Nova Scotia. We have gotten after it just the same as you have and the same as Ontario has, but, as you well said, that is only until the employer catches onto the fact that he must give in the pay roll the names of those men who have been hurt, so that they will be there for inspection. You get only the most ignorant employers, those who do not catch onto a thing like that, but once they do, you understand, that is no check at all. You will notice in the form we have there that we have found the greatest trouble with our lumbering operations. A man works at that during the wintertime, away back in the woods, and it is the easiest thing in the world for him to keep two time books. We make a form like this. We get the quantity of lumber that he has logged and the quantity sawed. We get this information and these particulars, and then if we find, when the auditor goes around the following year, that the man is cutting and sawing lumber and getting it to the railway station at \$2 or \$3 a thousand, we raise his pay roll and send him a supplementary assessment. A case like that came up just a few days before I left the office. We did raise a man's pay roll, and he disputed it and said that his figures were right and that he could cut his lumber very cheaply. We asked to have his pay roll sent in, and he sent, not his pay roll, but his time book. We checked up on his accidents, and found that four of the lot were names that were not in his time book at all. Of course, that is a help, but once the employer gets onto it, you are out of court altogether with regard to it.

Mr. KINGSTON. Have you made any estimate, Mr. Armstrong, which might possibly be considered a better basis of assessment? I suppose the costs of lumbering operations vary in different districts, but would it be fair to set a code which would indicate that

for every thousand feet of lumber manufactured from tree to mill—that is, from the time you started cutting a tree until the lumber comes from the mill—there is a certain number of dollars of wages paid per thousand feet? Have you ever figured that might be a possible basis instead of merely an assessment on the wages?

Mr. SINCLAIR. We do that.

Mr. KINGSTON. Well, what do you consider the number of dollars of actual wages—

Mr. SINCLAIR (interrupting). Say a man has so many thousand feet of lumber, and the contract price is a certain amount. If we cannot get a proper pay roll, we charge him 70 percent of the contract price as his labor cost; that is, the cost of producing.

Mr. KINGSTON. I mean dollars in wages that are fairly spent in the harvesting of a thousand feet of lumber.

Mr. SINCLAIR. If a man has a contract to deliver so many thousand feet of lumber, if we cannot get a proper pay roll we say 70 percent of that contract price is the amount of money he expended for labor.

Mr. GREGORY. And that represents the pay roll?

Mr. SINCLAIR. That represents the pay roll.

Chairman ARMSTRONG. Under that plan, if a principal lets a contract to a man for 10,000 feet of sawn lumber, at, say, \$10 a thousand, you take 70 percent of that \$10, which would be \$7 a thousand, and assess him—

Mr. SINCLAIR (interrupting). Of course, when a man goes into the woods to produce lumber, there is the principal and there is the contractor. A contractor will produce a million or two million or five million feet of lumber to be delivered to his principal. He takes a contract to deliver that at so much money. Whether he wins or loses does not affect us at all. If we cannot get a proper pay roll from him, we assess him on 70 percent of the contract price. It has been kind of accepted by the operators that that is about the amount of money paid for labor.

Mr. GREGORY. Seventy percent of the contract price represents the pay roll?

Mr. SINCLAIR. Yes; the rest of it is profit and incidental expenses—70 percent for labor.

Mr. KINGSTON. Perhaps in terms of contract price it might be better than board measure. I was hoping that I might get an expression of opinion as to the relation of wages to board feet. Say a million feet of lumber is the output of a certain operation in the winter time, could we say that \$7,000 or \$70,000, or some number of dollars, fairly represents the labor in a million feet of lumber?

Mr. SINCLAIR. You could not in our Province because one man would do the cutting and another man the driving and another man the sawing, and it would be almost impossible to do it that way.

Chairman ARMSTRONG. I do not think it is possible to get anything in regard to that, except the pay roll. If you use the quantity of lumber logged and sawn, you have to take into consideration the question of how far that lumber has been hauled—how far from the place where it was cut to the sawmill, and how far the sawmill

may be from the railway station. It may be quite handy to it in some cases. Another point that comes up, and I suppose it does with the other boards, is the question as to whether this employer is a company. If the employer is a joint-stock company, then every person employed there comes under the act. If he is an individual he does not come under the act with us unless he applies, and neither do the members of his family. We are speaking more particularly of lumbering, because that is one of the big problems we have. I suppose that nearly one-quarter of our employers in Nova Scotia are lumbermen, and most of them are intermittents. For that reason we have more trouble with our lumbering operations than we have with any other business. On account of the questions of members of the family and that of hauling, I do not see how you can get at any figure to represent the cost of that. But in individual cases, where we consider the pay roll too small from the sworn pay-roll statement of the employer, we do tell him that he cannot get that lumber out for that figure, and that we are going to put it up to a fairly good amount, perhaps \$7 or \$8, or two-thirds of that, because, you see, the team hire also comes in. The teams do not come under the act. We put it up to that figure, and we will not come down unless he is able to produce a time book, which very likely he says he has not got or has destroyed. We are willing to talk this matter over with him.

Mr. KINGSTON. Have you in Ohio, Mr. Gregory, made an interpretation as to who is an executive officer, or have you a provision in your law that an executive officer must be especially named if he wants to be covered?

Mr. GREGORY. Mr. Evans has a rule on what constitutes an executive officer. You might read what the rule says, Mr. Evans.

Mr. KINGSTON. Is the managing director of a company in your State covered, Mr. Evans?

Mr. EVANS. Our interpretation is that where the employer is a corporation, the officers are employees if they are actively engaged in the conduct of the business, and it is rarely that we have any difficulty as to corporate officials. When we come to a partnership, our interpretation has been that a member of a partnership is not amenable to the compulsory provision of the law.

Mr. KINGSTON. Then you have not had occasion to interpret who is an executive officer?

Mr. EVANS. No.

Mr. KINGSTON. Have you, Mr. Armstrong?

Chairman ARMSTRONG. We have a regulation in regard to that. An executive officer who is actually engaged in the business is treated as a workman.

Mr. KINGSTON. Must he be an official director of a company?

Chairman ARMSTRONG. No, it does not make any difference. Mr. Sinclair, do you want to say something about assessments?

Mr. SINCLAIR. We have a little different form from those of any of you. Of course, we are a very small Province; the population of our whole Province would be just that of a good country town in some of the States. Our system is this: We cover everybody; so long as a man employs one man, he is under the act. We make every

employer file a pay roll the first of the year. We assess the employer on the amount that he files. We collect it the best we can. If a man does not pay, we simply make out a declaration and file it with the clerk of the supreme court or the county court, whichever it may be, and that becomes a judgment of the court. We issue an execution, and that execution binds all the real and personal property of any contractor who was in any way interested in the business. That is, if you, Mr. Gregory, leased a mill from somebody and carried on a sawmill business, and you did not pay your assessment, we would attach that mill. That is a lien. Our judgments are a first lien, ahead of mortgages or any other thing except taxes. So we do not have very much trouble in getting our money. I suppose, roughly speaking, that maybe we collect 90 or 95 percent of our assessments every year. Of course, there are times when a man flies away and that is the end of it.

We have, as I say, a system where the man files a pay roll. We assess him. At the end of the year he gives us his actual pay roll. If his pay roll was more than he anticipated, we make an adjustment. If it was less, we make an adjustment and refund the money to him. We have not had very much trouble in collecting; no more, I think, than ordinary people would have. As I said, we have a comprehensive act so far as coverage is concerned—every workman is covered. If a man is injured and files his claim with our board, we pay the claim if he is under the act. If the employer has not filed a pay roll, we simply assess the full amount of that claim against the employer and try to collect it.

I have in mind one case that happened this year. It was the case of a small grocery store. A boy who was working there cut his finger off on one of these slicing machines. The employer's whole assessment would have amounted to about \$10, at the rate we assessed him, if he had filed the proper pay roll, but he did not file the pay roll. The claim came to \$400 or \$500, and it was settled. We assessed the full amount against that man and made him pay it. We find that that is the best way we know of for seeing that employers do file their pay rolls. They know that if they do not, and anything happens to one of their employees, they have to pay the damages. We pay full compensation, full medical aid, and everything else. We charge it all up against the employer who did not file his pay roll.

Of course, we have had a great deal of trouble. Like the other Maritime Provinces, and the Province of Quebec, probably about one-half of our industry is lumbering and pulp mills. We did have some trouble in getting the small contractors to give us their pay rolls. A big firm like the International Pulp & Paper Co., which is the biggest operator in the Province and the biggest employer of labor in the mills and lumber industry there, might have two or three hundred subcontractors, men who would take a contract to get out 100,000 feet or 1,000,000 feet of lumber, or whatever it might be, and deliver it at a certain place. It is sometimes pretty hard to get these men to file their proper pay rolls, because they are men who are probably not what you would call educated men. They are men who do not keep a regular set of books. They have just a time book. You would be surprised to see what some lumbermen keep for books, with the amount of operations they have.

We have instituted this system, that those big employers file with us a pay roll covering all their contractors no matter who they are. If an accident happens, the claim is put in by the subcontractor, and if he is working for the International people, or somebody else, we pay the claim. We check up, and go to the big contractor and audit his books as to the contracts these people have, and the amount of money that they get. If we have not gotten a pay roll from them, why, as I said before, we figure it out under an agreement with these big contractors that 70 percent is about the amount of money that is paid the men who are working in the woods or stream driving. We audit their books and we know just how much they pay. If the small contractor does not have a complete set of books, well, we do the best we can, but we do not penalize that small contractor if he has not filed a sufficiently large pay roll. Nor do we penalize him very often if he has not filed a pay roll at all, because probably he is doing a small job and has only two or three men working with him. That is our system of assessing, and we get along fairly well.

You are all talking about the State funds. We have no State fund. The Province has nothing to do with our financial work whatsoever. We assess the employer what we think would be a sufficient amount of money to meet the claim. If at the end of the year we do not have enough money, I suppose we would have to make another assessment. But in no case has the Province or the State anything at all to do with our financial situation. We have to collect the money. We pay it out, and it is up to us to see that we get it.

Mr. STEWART (Washington). Where a man is killed, and the employer has only 1 or 2 employees, and he has not reported to you and has never paid any premiums, what do you do in that case? I know you pay for the accident to that man; I understand that. But what do you do to that employer? Does he pay any back premiums or anything of that sort?

Mr. SINCLAIR. Well, we go right after him, and of course we pay the widow.

Mr. STEWART. Yes; I understand that.

Mr. SINCLAIR. And then we go after the employer; if he has not filed a pay roll we do not make any fuss about it, but we charge the full cost of the accident against him.

Chairman ARMSTRONG. Plus the premium.

Mr. SINCLAIR. Oh, yes; we assess him, and we make it big enough so that it will cover everything. We get his actual pay roll, of course, and that is what we assess him on.

Mr. STEWART. Suppose it wipes him out entirely. Suppose he has not enough money in his whole plant to pay. Suppose he has a portable sawmill, and that is everything he has in the world. Suppose all he has will not pay you enough?

Mr. SINCLAIR. Well, we just take what he has. Of course, sometimes we cannot get enough to meet it all, but it is a very good system just the same.

Mr. COLBURN (Massachusetts). You would not pay the widow a lump sum, would you?

Mr. SINCLAIR. We pay the widow \$30 a month while she remains single, and \$7 a month for each child.

Mr. COLBURN. If that sawmill man could afford to pay that much, you would let him pay it that way?

Mr. SINCLAIR. Oh, no; we would not do that. We capitalize that and simply assess it against the man.

Mr. STEWART. That was the trouble with the old liability assessment, that it wiped the small man out; the new idea was to scatter this thing over the industry and prevent that wiping out.

Mr. SINCLAIR. Well, we do that, too, in our rate. We provide for that. Take sawmills, for instance. We have a certain rate that we figure will be sufficient to meet the accidents as they arrive but we do not have much sympathy for the man who deliberately tries to evade the act. We are supposed to be there to see that the workman gets his money.

Mr. STEWART. Then if he has filed his pay roll with you, if he is in the system, you do divide his loss with the industry?

Mr. SINCLAIR. Oh, surely. The trouble is that the small man has the big losses. The big man always pays.

Mr. BEASOR (Ohio). May I, before we leave this subject, ask Mr. KINGSTON one question? I want to clear up something in my mind. You say you have about 25,000 insured in your Province?

Mr. KINGSTON. Something like that, 24,000 or 25,000 employers who are reporting to the board.

Mr. BEASOR. And you bill them the first of the year?

Mr. KINGSTON. Within a month or 2 or 3 following the receipt of assessments in all classes.

Mr. BEASOR. In other words, your insurance expires at the end of the calendar year?

Mr. KINGSTON. Well, it never expires actually. Of course, in a sense, it expires on the 20th of January. You see, it expires with the calendar year, but employers have 20 days, until the 20th of January, to get the new pay rolls in, and there is really a coverage without any default during those 20 days.

Mr. BEASOR. How do you take care of this peak load that you have to handle at that time of the year? Do you put on additional help to get out all the work at that time, or does your ordinary office force take care of that?

Mr. KINGSTON. Well, we shift from one department to another. The assessment department during the month of January and also in February is very heavily overloaded, and we borrow from the other departments whenever it is necessary to assist the assessment department during that peak load. We also get in additional people for a short period if they are needed.

Mr. BEASOR. On the whole, then, what percentage of your employees are needed in this type of work throughout the year?

Mr. KINGSTON. Well, roughly speaking, I think we have about 130 employees on our staff, and our assessment side is pretty nearly one-half of the work. The other half is devoted to claims and statistics and files and that sort of thing.

Mr. BEASOR. Have you ever felt that it would be any advantage to the functioning of your bureau to scatter these expiration dates,

over the year at different times, instead of having January 20 for all of them?

Mr. KINGSTON. You mean stagger them?

Mr. BEASOR. Yes; that's it.

Mr. KINGSTON. No; we never have done that. We have thought that it would be a bit confusing to have certain classes expiring on the 20th of January, and certain other classes expiring in other months of the year.

Chairman ARMSTRONG. We will leave assessments for the present. Mr. Watson, of West Virginia, is bringing up the question of reserves, and I suppose that will include investments.

Mr. WATSON. I merely wanted to find out what uniformity there is in reserve set-ups in the different funds of the organizations belonging to this association. One of my problems is that I do not know, for instance, what Ohio's plan is on reserves—what method Ohio uses, Ohio's mortality tables, etc. I just mentioned Ohio because it is a neighboring State of ours, and I should like to know what they do in Ohio about their widows and their permanent totals.

Mr. EVANS. Our deaths happen to be on the basis of payment for a specific period of years, so that we are not involved with payment over a life expectancy, and we do not have mortality to involve us; that is, except for short periods. Our widows receive their awards over a period of from 6 to 8 years. The effect of mortality would be rather small in that period, so that we use only the interest discount in setting up our reserve on deaths. When it comes to permanent totals, which are paid on a life basis, of course we must use mortality tables for those. We have used the Danish table up until the last 2 years and since then we have used our own experience.

Mr. KINGSTON. You mean your own compensation experience or the American table experience?

Mr. EVANS. We use our own actual Ohio experience of mortality in our permanent total cases.

Mr. STEWART. How about remarriage?

Mr. EVANS. Remarriage does not enter into our deaths.

Mr. STEWART. But you have a remarriage fund, haven't you?

Mr. EVANS. No.

Mr. KINGSTON. What you are saying applies only to permanent total cases?

Mr. EVANS. Yes.

Mr. WATSON. We have had lots of experience on the remarriage matter during the period of depression. We passed through one year where not a single widow remarried. A widow would rather have the \$30 a month compensation than to have a man.

Chairman ARMSTRONG. Do you give them a bonus? In Nova Scotia, in case a widow remarries, a cash settlement of \$500 is paid to her at once. We have had widows come into the office and ask us if we were prepared to pay the money if they got married. Of course, it is a good investment for us. Sometimes they even bring along the prospective husband just to show their good faith.

Mr. WATSON. The West Virginia board has had the advantage of having Mr. Fondiller with it for a month or two, and Mr. Fondiller tells me that the State of New York pays a bonus to a widow, no matter when she marries. The West Virginia law is that if she marries within 2 years from the date of the death of her husband, she is awarded a cash settlement of 20 percent of what her widow's payment would amount to in 10 years. That usually runs to \$600 or \$700.

Mr. WALKER. In North Dakota we pay 156 weeks. When widows remarry, we pay them a lump sum amounting to 156 weeks of their money. The widow's compensation is based upon the salary received by her former husband. There is a maximum of \$30 and a minimum of \$18 as a basis for computation.

[Mr. Watson read a letter from the executives of the casualty companies issued on December 18, 1915, stating that such companies do not accept risks where the catastrophe hazard is apparent. He also filed with the reporter a pamphlet entitled, "Record of Monopolistic State Workmen's Compensation Funds", published by the Association of Casualty and Surety Executives, 1 Park Avenue, New York City, revised July 1934, and commented on the fact that about six pages were devoted to the Ohio fund and not quite so much to West Virginia.]

Mr. STEWART. What is the insurance rate per ton now in West Virginia for coal mines?

Mr. WATSON. It is per hundred dollars, Mr. Stewart.

Mr. STEWART. Well, what does that mean in tonnage?

Mr. WATSON. It would be somewhat of a guess, but I would say about 4 cents on the average.

Mr. STEWART. What is the rate per \$100?

Mr. WATSON. The base rate is \$3.50; the maximum is \$7.70, and the minimum is \$2.28. It swings between those two figures.

Chairman ARMSTRONG. That is on account of your merit rating.

Mr. WATSON. We are using a 1-year experience of each contributing subscriber, and I do not believe in it. I think any merit rating should be on an experience of not less than 3 years, probably 5. We have a great many fluctuations in the level lines; in fact, there is no level. When we took over this West Virginia fund, it had an invested fund of \$17,400,000. At the end of 1 year this increased \$2,600,000, so it is over \$20,000,000 now, and it earns 5.2 percent. Of course, that is not going to keep up very long. However, it is well invested. The problem is that the general public thinks of that compensation fund of over \$20,000,000, and wants to get a piece of it. It does not realize that every cent of that is set up as a reserve for widows and permanent partials and permanent totals.

Mr. STEWART. Have any bills ever been introduced into your legislature in an attempt to cover that fund into the State treasury or any attempt to do anything like that?

Mr. WATSON. No; and we won't have, Mr. Stewart.

Mr. KINGSTON. What interest rate do you use in setting up your reserve?

Mr. WATSON. There was a legislative investigation in 1929; the fund was charging 4 percent on the reserve—

Mr. KINGSTON. Calculated on a 4-percent basis?

Mr. WATSON. And after this legislative investigation, which was a very exhaustive one, it used 5 percent.

Mr. KINGSTON. What do you use in Ohio, Mr. Evans—what interest basis?

Mr. EVANS. Three and one-half percent.

Mr. KINGSTON. For the last 20 years we have been setting up our reserves in Ontario on a 5-percent basis. We have done that on all of our funds. We have done that up to the present time, but I merely wish to observe that with the constant dropping of the earning power of money these days we have to look forward to calculating our reserves on a substantially lower interest-earning basis.

Chairman ARMSTRONG. I think all State funds are up against that problem. In Nova Scotia we started at 3½ percent; in 1928 this was changed to 4½ percent and we are still calculating it at 4½ percent. At the time we made the recalculation we turned back to the accident fund for distribution among the employers by retroactive ratings in that particular year, or the following year, about \$415,000. We felt at that time that we could invest the money at 5 percent, and for that reason we figured 4½ percent was a good figure at which to set aside our reserves. At the present time we consider the average life of our investments to be 22 years, and the interest-earning rate is 4.8 percent. But the question of what we should do with regard to setting aside reserves at a lower rate of interest will very likely have to be taken up shortly.

Mr. SINCLAIR. What are you using now?

Chairman ARMSTRONG. Four and one-half percent.

Mr. SINCLAIR. It was the same way with us. We started out at 4 percent, and the Government thought it should be changed to 5 percent. We put it up, but I have brought it down since.

Mr. KINGSTON. Is the problem of defaulting in bonds coming to be a serious one with you in Ohio?

Mr. GREGORY. It is some problem; yes. It is a problem.

Mr. STEWART. What kind of bonds do you mean?

Mr. KINGSTON. In Ontario we have never invested in anything but Dominion, Provincial, and municipal bonds, and as to municipal bonds we have them scattered over practically all the industrial towns in the Province. We have not gone beyond the Province. But some of those industrial towns have fallen on difficult days in these last 2 or 3 years, and they may default their principal payments. Not so many have defaulted their interest payments, but it is a serious problem that is confronting us. Where there are payments of principal and interest, they have defaulted their principal, but not so many of them have defaulted the payment of the interest.

Mr. SINCLAIR. Well, is the Province not standing behind you?

Mr. KINGSTON. No; the Province does not guarantee municipal bonds. It guarantees some hydro bonds and that sort of thing. This is a problem that is confronting all of our State funds, where we necessarily must get our money in and invest it for our reserves.

We have been earning 5 percent during all of these years, but if you take into consideration these defaults, it is a problem. We are hoping that everything will come back in time, but meanwhile it is a problem that has to be considered carefully.

Mr. WATSON. I firmly believe that $3\frac{1}{2}$ percent is a good figure to use. If you are earning $4\frac{1}{2}$ percent, use that extra 1 percent for surplus. That is sound banking.

Chairman ARMSTRONG. That is all very well, Mr. Watson, but your Government is borrowing money for 2 years at 4-100ths of 1 percent; the Dominion of Canada is borrowing money in the New York market for 2 years at 2 percent; the Province of Ontario borrowed money the other day for 5 years, I think, at about 2.97 percent; the Province of Quebec borrowed money a month or so ago for 3.02 percent, and the Province of Nova Scotia put out a 5-year loan just a few days before I left at 3.16 percent. If these things are happening, if money is going to be a drug on the market, the same as it is at present, I question whether $3\frac{1}{2}$ percent is a low enough rate on which to calculate our reserves.

Mr. STEWART. Are the State funds, with their investment and their defaulting bonds, etc., any worse off than anybody else? Are they any worse off than the life insurance companies or the private insurers of workmen's compensation? You weep and weep because your bonds are going down, but do not forget that the other fellow's bonds are going down just as much, and after all, they are going down a great deal more, because you have made a much more careful investment risk. You have invested your money better than any insurance company or any bank has done, and it seems to me that this argument that the bottom is falling out from under your bonds is one that you can safely refute and resent. The question is, are you any worse off than any other insurance company?

Chairman ARMSTRONG. We usually have to lay our cards on the table in making our reports, and they speak for themselves, but I should like to know of any insurance company that will publish a statement in regard to how much its bonds have decreased, or at what price they are carried on the books.

Mr. KINGSTON. I think Mr. Stewart's statement a while ago is right to the point. I mentioned this matter merely to emphasize the need of reconsideration of our interest-earning basis because of the lowering of the earning power of the invested fund. I will put our investment list in Ontario against any insurance company's list, bond for bond, that you can produce, and I think it will bear a very favorable comparison. I am not worrying about that feature of the thing, although there are bound to be some defaults in some of them.

I agree with Mr. Stewart that the insurance companies are worrying a good deal more about defaults than we are, but we have to keep in mind that in the next reconsideration of our reserves we must consider the question of interest earnings.

Mr. GREGORY. How do you buy your railroad bonds? Do you go into the open market and buy them, or is there some provision of law which gives you a preference on that class of bonds?

Chairman ARMSTRONG. We go into the open market and buy them. Of course, you know as well as I do that there is no use to go and

ask for tenders. If you want to buy bonds and you go and ask for the lowest price, it is not always the lowest price that you get. If you just watch the market and take the offers as they come in, you can do a far better job than you can otherwise. You can do it better that way, because the minute everybody knows you want \$100,000 or \$200,000 of any particular stock, they think that, instead of \$100,000 or \$200,000, there may be a million wanted, and that shoots the price right up.

Mr. KINGSTON. Do you invest your own funds in Ohio, or is that done by the State treasurer?

Mr. GREGORY. The commission invests its funds, and invests in bonds of the State or State subdivisions.

Chairman ARMSTRONG. Is there anything else that anybody wishes to bring up about the matter of reserves?

Mr. KINGSTON. I should like to bring up the question of minimum assessments, which I should have brought up earlier in the discussion. Do you have a minimum assessment in Ohio?

Mr. EVANS. You mean a minimum premium?

Mr. KINGSTON. Yes; a minimum premium, if you will.

Mr. EVANS. In effect, we do not. The rate applies absolutely. We do, however, require a minimum premium payment of \$5 for a new employer. However, that is allowed to stand against his account until it is completely absorbed; that is, if he continues in business.

Mr. KINGSTON. We have not only a minimum premium, but also a minimum pay roll. For instance, if a man has only a \$100 pay roll, the minimum rate on that would be a mere bagatelle, so we take both the rate and the pay roll into consideration. There must be at least a \$300 pay roll for a basis, and we have to have a minimum rate of at least \$5.

Mr. SINCLAIR. We have a minimum rate. We say the pay roll cannot be less than \$400.

Mr. WALKER. We have a minimum rate, which is five times the basic rate plus \$3.

Mr. STEWART. But suppose a man's pay roll is less than \$400. What do you do then?

Mr. SINCLAIR. We assess him on \$400; we do not make any assessments under \$400.

Mr. STEWART. Well, isn't that pretty tough on the little fellow?

Mr. SINCLAIR. Why, not when you consider what you are carrying. It is the little fellow who may have the accident, you know. The premium on \$400 is not very much.

Mr. KINGSTON. What about this matter of retroactive rates? If you made your rate at the beginning of the year, and the experience for the year indicates that it has been altogether too low—of course you revise your rate periodically, either in the middle of the year or at the end of the year—are you going to recover that money from the employers of the past year, or are you going to impose all the increased rate on the employers of the coming year? Do you have a retroactive rate in Ohio?

Mr. EVANS. No, we have no retroactive rate in Ohio.

Mr. KINGSTON. Do you in New Brunswick, Mr. Sinclair?

Mr. SINCLAIR. No. In theory we are supposed to, but we have found out that it has been unsatisfactory. The employers would rather have us raise the rate for the following year than bother with it. That is the practice.

Chairman ARMSTRONG. In Nova Scotia we quote rates that we consider to be fair, based on our experience for quite a number of years, always feeling as if we should be on the safe side. If, at the close of the year, we find that our experience has been fairly good in certain industries, we give those industries a retroactive rate; that is, if the rate would be \$2, we might reduce it to \$1.50. On the other hand, if we have found that the experience has been bad, we have never yet raised a rate for the past year. We have always let the employers in the future look after that. The reason why we have done that is that we think that where commitments have been made it is hardly fair to go back and get after the employers for more assessments.

Mr. KINGSTON. Well, if a contractor comes over to Ontario from Ohio and gets a big job and finishes it in 1934, the effect of his coming over is to increase very substantially the cost of accidents in that particular class. You can imagine what a holler the employers at home would raise if we did not go back to that Ohio contractor who came over for just the one particular job, and seek to collect that retroactive increased cost. I illustrate that only as one reason why there is a justification in the retroactive rate increasing as well as decreasing. We retroactively increase rates quite substantially if there is occasion for it, and frequently, Mr. Armstrong, we reduce the rate if there has been a very favorable experience.

Mr. GREGORY. What happens if you find the general set-up is not favorable enough?

Mr. KINGSTON. We increase the rate for the following year.

Mr. GREGORY. The great trouble we have—I do not know whether you have had the experience or not—is with these migrating employers, who are chiefly contractors. You do not hear much about them until after they are gone. They move in, perform the piece of work under contract, and leave their human wreckage behind, but we do not hear of it until 6 months or a year afterwards.

Chairman ARMSTRONG. You see, here is where we have that type of person. We hold the principal responsible; that is how we get clear of that. We also have this feature, that we have a first lien on anything used or produced in the industry. Now if a man contracts to build a house, we have a lien right on that house.

Mr. GREGORY. Well, you are rather happily situated.

Chairman ARMSTRONG. Is there anything further to be discussed? I think we should continue these meetings, and that perhaps we should have something like the paper I got out on this matter of assessments. If the program committee decides to give us a session—and I think we are all in favor of that—I think we should take a certain subject and have it put into some sort of written form so that it will give us something to talk about. We can have questions on the subject of assessments, or we can bring up something else, like reserves or investments.

[Meeting adjourned.]

TUESDAY, SEPTEMBER 25—MORNING SESSION

Section B—Problems of Private Insurance Carrier States and Competitive State Jurisdictions

Chairman, PETER J. ANGSTEN, Chairman Industrial Commission of Illinois

ROUND-TABLE DISCUSSION

Chairman ANGSTEN. The subject assigned to this section B for round-table discussion this morning is Problems of Private Insurance Carrier States and Competitive State Jurisdictions.

Some 2 or 3 years ago the convention adopted this method of bringing before the members some of the problems that attend the various compensation boards and commissions. Personally it has proved very beneficial, I think, to most of us. The discussions last year and the year before were very helpful to me, and I know from them I solved some of the problems that confronted Illinois. There will probably always be problems to be met by the various commissions; there will probably always be worries to solve; but we can minimize those worries and those problems by frankly discussing them with each other when we meet in these annual conventions.

When I became chairman of the Illinois commission some 18 months ago I found a condition in that State whereby employers were up against one or two propositions. If the employer wanted to become a self-insurer he had to make a financial statement showing his responsibility to carry the load. Sometimes he was unable to make this financial statement, and then he endeavored to get coverage. In some cases he was refused coverage by the carrier, and he then turned to the commission and said, "What is my next move? Do I have to go out of business? I cannot make a financial statement to enable me to carry my own insurance, and I cannot get coverage because the company has put me on the nonpreferred list. What am I supposed to do, go out of business?" That was a very serious problem confronting the members of the Illinois commission. We called together the representatives of the carriers there, and told them in plain words that this was their problem—that it had to be solved by the carriers themselves. The result of that conference was that we formed what is known now as the Illinois Allotment Committee. That committee is a committee of 5 men, 2 representing the old lines, 2 representing mutual lines, and the fifth man, so called, selected by the commission. Now, if at any time an employer in the State of Illinois is refused insurance by the five carriers, he becomes eligible to this allotment plan. His name is submitted then to the Allotment Committee, and by designation one of the carriers takes him. The next case that comes along is designated to carrier no. 2, and so on in rotation, so that that problem has been ironed out largely in Illinois.

We have now come to occupational diseases, and have some of the companies writing that.

Illinois has a twofold system of coverage—self-insurance and the insurance carrier. We have about 20,000, I think, in the State of Illinois who have qualified as self-insurers. I am happy to announce that the self-insurance end has grown quite fast, and there has been a sense of security thrown around that that did not obtain in bygone years. We have almost \$14,000,000 put up as collateral. We require employers to have a reserve for all outstanding claims before we permit them to carry their own insurance. We have about 125,000 employers in the State covered by insurance—about 20,000 with self-insurance. There are a great many phases we have not touched yet nor properly analyzed.

Are there any other topics?

Mr. DORSETT (North Carolina). The chairman stated that in Illinois the problem of getting all the manufacturers subject to the law covered with workmen's compensation insurance has been solved by this allotment plan to which he referred. We have such a plan in North Carolina, but it has become the greatest nuisance you ever saw. I represent the employer group on the commission. Our State requires that one man represent the industry, one man labor, and a third man, the chairman of the commission, is a so-called neutral. We found that the Workmen's Commission Bureau, over which we have no jurisdiction, will perhaps assign a risk to the American Mutual today. The next week that man may have an accident in his plant and the American Mutual will immediately get out of the risk. That manufacturer is then forced again to have three carriers decline his risk, and maybe, when he has another accident, 6 months later, the carrier to which the risk has been assigned immediately gets off that risk again. Consequently, quite a goodly number of the employers in my State are constantly worried about that procedure, because they do not know how long the risk is going to be covered after it has been accepted or, rather, assigned to some company doing business in the State.

The plan that you refer to has been in effect in our State, I suppose, about 2 years. About 2 months ago our supreme court, in a decision that is now famous in North Carolina and familiar to the legal divisions of most insurance companies, said that the inhalation of asbestos dust over a period of 14 months constituted an injury by accident. To members of the industrial commission that was a new definition as to what constituted an injury by accident. We had been holding for 5 years that it was something you could put your hand on at some particular time and place. To say that inhaling asbestos dust over a period of 14 months is an injury by accident kind of bothered the legal divisions of most insurance companies. I cannot say that I blame them very much for getting a little worried. The immediate result of that was that most of the companies that had entered into this allotment agreement withdrew from it, and we had, I suppose, in 1 day a dozen or more manufacturing plants close down because they were not willing to operate without insurance, and their insurance had been canceled.

I was told by our insurance commissioner, the day before I left North Carolina, that he was very hopeful that the allotment plan would be reentered into until our next legislature meets. I am satisfied that the group I represent is not particularly crazy about the

State fund. I think I am safe in saying that the majority of the manufacturers in North Carolina prefer to buy insurance to cover their compensation risks. However, our insurance commissioner has announced in the public press that if something is not done to relieve the situation I have been talking about—that is, the employer getting covered to-day and the company getting off the risk next week—there will be nothing left to do but to pass a bill for a State fund. My two associates on the commission have been for a long time in favor of the State fund; they have sponsored it in the State senate through their friends. But because the group I represent has not seen fit not to oppose it, they have not seen fit to sponsor it, and no State fund bill has ever been able to get very far in our State senate. I am hoping that the two big mutuals and the two big stock companies in North Carolina will get together with reference to the plan you speak of, and give our manufacturers some assurance that when one of these companies issues a policy and takes a manufacturer's premium he may be assured that, for a period at least, that worry will be over and behind him. If that does not take place, I should like to have some of you who are wise in the ways of insurance companies and the proper administration of compensation law tell me how you answer the question your employer puts to you, "What next? What are we going to do?"

Mr. DEBEL (Minnesota). The next step is to have your legislature make this allotment, as we have in Minnesota, compulsory upon all the insurance carriers carrying workmen's compensation insurance in the State.

Our experience is not so disappointing as your experience in North Carolina. I am a member of the Compensation Insurance Rating Board. It was not so very long ago that we were talking that over with the rating bureau. The bureau is set up and maintained by the insurance companies, and it seems to work very satisfactorily in the State of Minnesota. Many of the so-called "assigned" or "allotted" risks remain permanently with the assignee company. It works out quite satisfactorily.

Another problem that has been adverted to here is the problem of self-insurance. We have the same situation in Minnesota. Our statutes require the employer to carry insurance covering his risk, providing, however, that he may make application to the industrial commission to be granted a permit as a self-insurer. We have about 200 concerns carrying the privilege of self-insurance in the State of Minnesota. So far as I know, not a single dollar has been lost to any employee through that arrangement. Applications are renewed every year, and they are not only scrutinized at the time the application is made, but we require financial statements that they are O. K.

In this connection, however, we have a real problem in Minnesota that I want to advert to, and that is what we call election not to be bound. Our act is a voluntary act. The statute, however, creates a presumption on the part of the employer; that is, it presumes that he is under the act unless he affirmatively elects not to be bound. We have had a great many elections not to be bound. The last figures are something like 12,000 elections not to be bound. Just within

the last year or so we adopted a policy of getting more closely in touch with these people who had elected not to be bound, and we discovered that a great many of them had gone out of business. The fact of the matter is that the concern which elects not to be bound is almost invariably a small concern and a weak concern financially, and that affords a real problem. We have not compiled any figures indicating the number of employees involved, but I think it is a well-founded statement that these concerns which elected not to be bound are weak financially. We are contemplating requesting the legislature to make this act compulsory.

Mr. DORSETT. You said there is a provision in your law that the allotment plan must be accepted by the insurance companies, that they must write the business. Did I understand you that they must write the business?

Mr. DEBEL. Yes, sir.

Mr. DORSETT. How do you enforce that?

Mr. DEBEL. The insurance bureau—the insurers themselves—have a working set-up through which they assign these risks in rotation to the companies doing business in Minnesota.

Mr. DORSETT. Will that company, if it refuses to subscribe to that agreement, forfeit the right to do business in the State?

Mr. DEBEL. That is the agreement; that is compulsory under our law.

Mr. DORSETT. Every company writing business in your State must necessarily comply with the law?

Mr. DEBEL. Precisely.

Mr. DORSETT. Is that part of your insurance contract, is it written into the insurance contract or only part of the insurance laws?

Mr. DEBEL. It is part of the conditions under which they do business in the State of Minnesota.

Mr. WILLIAMS (Minnesota). I guess I am not quite so impressed about that matter as my colleague is. It is true, that was very helpful, and it was the only solution we had in mind at the time when the difficulty confronted us. It appears to me that our principal difficulty is with the insurance companies themselves, who have no desire to write workmen's compensation.

Here is the practical proposition: Say you are an employer. This insurer will say to you, "If you will give me your fire and your public-liability insurance and a few others, I will write your workmen's compensation; if you do not do that I won't write it." A large number of employers are not going to be bothered with having three insurance companies refuse their risk in writing, which is what the law provides. The result is that some do nothing, and when they have an accident, a goodly number of them, not being financially responsible, the result is that sometimes we get a judgment at law on an award. That is about what it amounts to.

It would appear to me that our problem is, that we must make it compulsory upon every insurance carrier in Minnesota, in order to get his license to write workmen's compensation, to write every risk that is offered to him, unless the employer refuses to comply

with the safety codes of the State, and unless his financial rating is such that the insurance company will not be able to get its premiums. Personally, I can see no other answer to this problem.

I know of two specific instances in the last 30 or 60 days where employers who had had their risk carried for some 10 years without a loss, and had paid their premiums always in advance, were refused a renewal by the company because they would not permit it to write other insurance. If we have State insurance in Minnesota the insurance companies can thank themselves. Personally, I never can enthuse very much about the public going into business, although we do not say very much when the waterworks is controlled by the public. I would not be a bit surprised if, in the State of Minnesota this winter, the legislature would seriously consider the State carrying workmen's compensation or creating a State fund. That will be necessary unless the insurance companies themselves will agree that they will take all these risks without all the formalities, as I said. I have letters in my files in which an employer said he wanted his agency to take the insurance and it said no. He wanted a letter to that effect and it said, "No; we haven't the time for your business; we don't want anything to do with you." One particular employer says that the losses he has had in the last 4 or 5 years do not amount to anything—a few doctors' bills. Of course, the insurance companies all claim they are losing money. If it is impossible for private capital to invest in the workmen's compensation insurance field and make any money, and if workmen's compensation is going to continue, then, of course, the public, in the form of the State fund or some other method, will be compelled to take it over.

Incidentally, in our State we have today a number of failures, and I presume that is true about most of those carriers all over the country. My own belief is that not only should insurance companies be compelled to write this insurance, if they are licensed so to do, but they should also be compelled to give the necessary guaranties that when awards are made they are going to be paid. We have, however, experienced difficulties. We have had some \$400,000 of losses from either the employer himself or the insurer. If the employer is responsible, naturally he must, when the insurance company fails, take over the burden that the company assumed. These are problems that the insurance companies must meet; they must find some way. It should be compulsory, by legislation, that they write this insurance, and not compulsory just on the employer, who has something else to do. I am not in business now, but I have been, and I assume that under present conditions employers have a considerable burden, and they should not have the added burden of the necessity of begging somebody to take their money to cover their risks.

Mr. SUPPGER (Idaho). Out in Idaho we do not have the problems that seem to confront your boards. We have three systems. We have a State insurance fund, we have the self-insuring plan, and we have a plan of rewriting that coverage by old-line carriers. What are the objections to the competitive State insurance fund? Outside of the fact that all of us, perhaps, say in an offhand way we do not like the idea of the State going into business, what is

the objection? It appears to me that the object of the compensation law is to secure to every workman compensation when he is injured. That problem could be reduced in a very simple manner, it appears to me. I should like to have that question answered. What are the objections to the competitive State insurance fund?

Mr. DORSETT. Does the competitive fund in your State get good risks or bad risks?

Mr. SUPPIGER. We get good accounts.

Mr. DORSETT. Do they get enough of the good ones—get a reasonable proportion?

Mr. SUPPIGER. Yes; getting more and more of the better ones as the insurance companies refuse to write them.

Mr. DORSETT. Is your competitive rate the same as the insurance rate, or lower or higher?

Mr. SUPPIGER. Lower.

Mr. DORSETT. I take it that the fund is fully solvent?

Mr. SUPPIGER. The fund is solvent and it has a statutory reserve.

Mr. DORSETT. How long have you had your competitive fund?

Mr. SUPPIGER. For 17 years.

Mr. DEBEL. How many compensatory accidents do you have a year?

Mr. SUPPIGER. About 15,000, 80 percent of which—

Mr. DEBEL. That number is larger than ours.

Mr. SUPPIGER. Eighty percent of which are carried by the State insurance fund. I asked my question in good faith, gentlemen. I should like to know what are the objections?

Mr. DEBEL. I think there are probably a half dozen reasons—political, one; insurance company conditions, quite another. I do not know much about insurance but it seems to me that the insurance companies are in the position that they do not want to write this insurance. I have become convinced that the majority do not want it, but they are afraid to have the State enter into this field because they believe it will not stop there. As a layman, that is my impression. I am thoroughly convinced that the insurance companies would have no objection to the State going into the insurance field, provided there was security against other lines also being taken over by the State. I doubt very much if Minnesota would want the competitive proposition. It seems to me that the volume of business is comparatively small—in the depression times around \$3,000,000, and in peak times around \$5,000,000. At one time we had 50 carriers in Minnesota competing for that line of business, and naturally that cost a lot of money. In a State like Minnesota, with \$5,000,000 in premiums in 1 year, it appears to me that if the State is going into the business at all it should have all that business. I think there would be some objection to having the State going into that business if it did not have it all, and I doubt very much if the insurance companies would want to compete for what might be left.

Those are the two objections I know of, the one on the part of the legislatures, and the other on the part of the insurance companies, who fear that their field is going to be invaded and that the invasion will go farther than workmen's compensation.

Miss HARRISON (Maryland). Maryland has a system similar to Idaho. We have a State accident fund and also insurance carriers. We do not seem to have the problems that the Minnesota board is having. I think our State fund rates are a little lower than the competitive insurance carrier rates, but in some instances they are higher. For coal mines, I think, they are higher. Our law is compulsory. The employers must carry compensation insurance in Maryland by one of three methods—either by self-insurance, State accident fund, or competitive insurance carrier—provided they are engaged in extrahazardous employment in a business carried on for pecuniary gain.

Mr. DEBEL. Miss Harrison, how large a percentage of the funds are carried?

Miss HARRISON. The funds are increasing all the time. I understand ours has the highest standing in the United States.

Mr. KJAER (Washington). The report from all the State funds seems to indicate business is increasing right along.

As to the statement by Mr. Debel, I have known that that is exactly the reason why insurance carriers do not want to see a State fund; they are afraid it will affect other lines of business if that is permitted. That is a comparative statement, but I think they are afraid they will lose other business if the State fund becomes universal.

Miss HARRISON. The State insurance fund in Maryland can write only one kind of insurance, and that is workmen's compensation insurance.

Mr. SUPPIGER. You settle the problem yourselves, and it will not be necessary for the State to go into that business, but it is a problem that has to be met. Every workingman must be protected and he must get his compensation, and it is up to the insurance companies, if they want to stay in business, to carry business on and to make a satisfactory arrangement. What seems to bother the commissioner from Minnesota is a fear that will disappear when you have a State fund. You will find the conservative business men gradually coming into the State fund—the competitive State fund. That has been our experience, anyway.

Mr. DEBEL. Your attitude would be that a competitive State fund would be preferable to a monopolistic State fund?

Mr. SUPPIGER. Most decidedly.

Mr. DEBEL. Why?

Mr. SUPPIGER. Every official on the State insurance fund will be, like every other public official, in the public eye, and you will find a method of arousing public opinion to make State insurance funds function as they should function.

Mr. JOHANSEN (Illinois). I represent labor on the industrial commission. If I should say anything in disagreement with my brother, our worthy chairman, please consider that he is the neutral member on our commission, at least theoretically.

Our law provides that there shall be on the commission 2 who represent labor, 2 from the employers, and a fifth man who is impartial. The impartial member is a slave to the truth; we are permitted, of course, to be, at least partially, partisan.

I think, Mr. Suppiger, the high spot of opposition to State insurance comes largely from the fact that in America we have not been, to any great extent, socially minded. We are still individualistic, and we are still very much property minded. We know we cannot compete with the State, and we are fearful if we allow the State to enter into this function it may lead into other functions, and by and by we will just have the State. I think that, in the main, is the objection. Of course, the State will function in compensation insurance as it will eventually in unemployment insurance, not so much because of a choice as because we will be driven, in the end, to protect ourselves in the only way that is left for our protection.

We have in Illinois, as has already been stated by our chairman, two forms—the self-insurer and those who are covered by insurance. In our law there is a penalty of not less than \$100 and not more than \$500 a day for every day you operate without insurance, or without adequate financial protection. But I cannot recall any employer who has ever been even seriously disturbed by the agents who enforce that part of the law. For some time it was the attorney general's job to enforce that phase of the law, then the responsibility was transferred to the State's attorneys, or county attorneys as they are called in some of the States, and now it has been transferred back to the attorney general. Just 2 weeks ago the attorney general acted in the case of a self-insurer. There was a fund, which was finally gotten hold of, and the money was actually paid to the people who had it coming to them. A controversy arose between two mortgage holders, and the employer, when he was approached by the assistant attorney general, expressed his surprise and said, "I never took it seriously, that part of the law; I didn't think the attorney general would act."

Then we have another phase. We had a very serious disaster, what is commonly known as the "Cherry coal mine disaster", where hundreds of people were killed, and, of course, it involved a great liability. As a result a great many coal operators adopted self-insurance either by themselves or through allotment for the time being. We had a fund set aside, 5 cents a ton for coal, to be used for compensation only. Over a period of some 15 years there developed a situation where these self-insurers were indebted over \$20,000 to widows for men who were killed. That has never been paid. Then what happened? The corporation reorganized, or rather a large part of the personnel of that corporation organized another corporation, and when we went to touch these bonds and securities we were told by the lawyers who were the legal agents, "That isn't the same corporation; that is a different name; they don't owe this money; you cannot touch it."

The lawyers are clever, and they never make a law that does not have some snag in it. The laws are made by lawyers, and they are not making laws to put lawyers out of business, any more than carpenters make laws to put carpenters out of business. In other words, you find lawyers everywhere—in the Supreme Court and everywhere else. They protect themselves and the doctors protect themselves. We have our troubles with the doctors, too. But this is an insurance problem. It seems to me that competitive insurance is the best way out.

We have the same cry that you have in Minnesota that compensation insurance does not pay; that the companies are losing money all the time, and the only reason they are writing it is because they get the employers to give them other business—fire insurance, public liability, and so forth. Yet what do we find in the record of these insurance companies that have gone under during the last 4 or 5 years? We find that with none of them was it due to their carrying compensation insurance, but rather to their bad investments. That seems to be the record.

We have people coming to the commission with their difficulties, and, so at least it seems to me, a large number of these people base their conclusions upon their needs rather than upon their rights. They cannot help it; things have been too tough. The road is not clear yet. It is probably clearer today than it was a year ago or 2 years ago, but there is still plenty of work to do. The question of insurance is the most important, it seems to me, and then compensation to guarantee the workingman and working woman protection under the law in case of accident. Where an employer has no insurance, we find a great deal more red tape and a much greater expense in the collection of compensation, and, what is still worse, probably no place to collect. That is the greatest difficulty.

There should be insurance, and if the insurance carriers cannot effect an intelligent way of doing it, I see no reason why the State should not go into that business. Why not let the State try it? Of course, I am for the State, and so is the property man for the State until the State invades his jurisdiction. What he tells me is that I must be a law-abiding man; that I must abide by the flag; that I must subscribe to the Constitution, because the State is everything. That is very good until the State wants to function in his jurisdiction, and then he says, "No, no, that will not do; we do not want the State to do it."

I think we are traveling in the right direction, though probably not as fast as some would like, and I am sure that in a comparatively short time not only will we find the way to have proper coverage for compensation, but we will also have insurance against other unforeseen calamities which we have not been able to meet intelligently up to the present time. I am with your plan, Mr. Suppiger, I think for the present that is the best way out.

Mr. SUPPIGER. You said you had a criminal procedure if a man refused to carry compensation coverage?

Mr. JOHANNSEN. No, we have no criminal procedure; only a fine of \$100 a day, with a maximum of \$500.

Mr. SUPPIGER. Is that the only remedy you have?

Mr. JOHANNSEN. That is all.

Mr. SUPPIGER. May I suggest that you get through the next legislature a bill giving you the right to enjoin a man from doing business unless he complies?

Mr. JOHANNSEN. That is a very good suggestion.

Mr. SUPPIGER. We have that in our law. We say, in the non-compliance article, that unless an employer complies we will enjoin him from doing business.

Mr. JOHANNSEN. Out in Idaho you have been largely agricultural; you have not had much of the industrial. We have a lot of coal mines in Illinois, and the coal operator is on the job all the time to protect the interest of the mine owner. By a comparison of the compensation laws of the various States, I find the laws better where there are fewer coal mines. Illinois has a much better law than most of the coal States, but there are States that have better laws than we have, better methods. But we are working in that direction, and eventually, I believe, we will have a situation where men will have a reasonable guaranty that in the event of accident they will have protection.

We had last year between 31,000 and 32,000 industrial accidents, including 426 fatal cases, as compared with 50,000 industrial accidents in 1928.

Mr. DEBEL. You mean compensatory accidents?

Mr. JOHANNSEN. Yes; we had a little over 600 fatal cases in 1928. I represented the carpenter's union in Cook County before I was appointed to the industrial commission—some 6 years. I might say I was their adjuster. They did not have any attorneys then. We were all told that we did not need lawyers; that compensation matters were simplified so that anybody could take care of them. Of course, that was not so, but we were told that and a lot of people believed it. In fact, I believed it myself for some time. Anyway, I made it my business to keep a record of every case in the years 1928 and 1929. I kept a record of the injury of every man and its approximate cause, whether an examination was made, and so forth, so that we might properly contrast it with that of the insurance doctors and the insurance experts. Not many of us are convinced that these company doctors are slaves to the truth, but rather we think that sometimes they exaggerate and that sometimes they are influenced by the fellow who pays their bill. When I would go to the insurance company and start to argue with the adjuster about medical questions he would naturally say to me, "What do you know about it; you are not a doctor?" Of course, I had to fortify myself with medical information that was at least intelligent, and that we could present for our side. We did all that, and we found that in Cook County and the adjoining two counties—that is the territory we took in—20 percent of the membership of our organization of carpenters—and the carpenter trade is not the most extraordinary hazard—met with accidents during the course of a year. We found a very small percentage of fatal accidents and a very small percentage of total disabilities.

We also found that the cost of insurance to our contractors was comparatively nominal. One of the largest contractors in Chicago, which had been carrying its own risk for a period of some 6 or 8 years, concluded from its experience that it was cheaper to have insurance, and for the past 3 years it has been covered by insurance with the American Mutual Casualty Co. That is one of the largest contractors, with offices in Chicago and in Cleveland, Ohio—a big concern. It found from actual experience that it was cheaper to have compensation insurance than to carry the risk itself, although while it was a self-insurer it had taken great care to protect itself against

accidents. For instance, while it was putting up a building in Lincoln Park, the total cost of which was approximately \$150,000—that will give you some idea of the size of the building—it had to tear down part of an old building and remove it. Instructions were given to its carpenters to wear a certain shoe with a heavy sole in order to protect them against getting nails in their feet as they walked around the building. Then, in addition, two men were employed to see that the nails in all of the old boards were bent over. The contractor used that extreme precaution while it was a self-insurer. Whether it is still doing it I do not know, but it did at that time.

In Illinois in 1928 and 1929 the total number of accidents was around 50,000. About 51 or 52 percent of those accidents represented coal miners, about 35 percent men in the building industry, and the balance men in various other industries. We also found that while coal miners had 51 or 52 percent of the accidents, 70 percent of all the compensation was paid to coal miners. How do you account for that? Because the coal miners' union had an efficient administrator to see that every man was insured and to see that every man who was injured was reported and protected, and the other unions did not. I am convinced from that that the workingman should get out and do something for himself. He must organize to protect himself, for if he leaves his salvation to the lawyers and the doctors and the politicians, well, it is just too bad for him; he had better do something for himself.

Mr. SWEENEY (Pennsylvania). Mr. Horner thought you might be interested in one or two things we have been doing in Pennsylvania along these lines in the last year—just a brief outline of our situation. About 50 percent of our accidents are covered by self-insured employers, probably about 25 percent are covered by the State fund, and the remaining 25 percent are covered by other insurance companies. We have the ordinary problem of the competitive State fund getting the dregs of the business, more or less. One reason for this, I guess, is that it has always been the attitude of the State fund in Pennsylvania that it should not go out and compete for business. In New York the State fund carries on, I believe, an active competitive campaign for business. As a result of its attitude the State fund of Pennsylvania gets practically all of the very poor coal-mine risks. Our compensation system has probably been helping the State fund in the last year in getting poor compensation risks. We have had this problem of uninsured employers. It has been our experience, that if when an employer is not insured, we get our adjusters after that employer and an award is made against him, in only one or two jurisdictions have we been able to get the courts to tie in their award against uninsured employers with their parole system, so that the employer who is uninsured has to report regularly to the parole officer of the court that he has made his payment. We have utilized the C. W. A. program during the last year to check up uninsured employers. We organized a door-to-door canvass of employers throughout the State, and in a short time, through the C. W. A., we interviewed some 20,000 employers and found about 4,000 who could not produce evidence of insurance. Whether that is typical we do not know—about 20 per cent.

It seems to me that is important in a State where we depend upon employers being insured in insurance companies unless they are given the privilege of self-insurance. That was a problem, trying to get the men insured. Of course, when the C. W. A. workers called on the employers they gave them a warning of the penalty—a fine of \$100 or 6 months in jail, every day of being uninsured being a separate offense. But that did not have very much effect. These men were sent a post card containing a copy of the statute and a statement of the law, and were told that if they did not comply therewith in a very short time they would be prosecuted. Unfortunately, we have only 15 men to do the prosecuting throughout Pennsylvania, so we have not gotten many prosecutions. But we are following up on that with these 15 men. I do not know how many of your compensation statutes are tied in with the bureaus of investigation, if you have them—factory investigators, and so forth. When our factory investigators make their routine inspections, they check for evidence of insurance. They leave these return postal cards containing copies of the law, and, following up those inspectors, our supervising inspectors call on these employers. If they have not taken out insurance after the second or third warning, our compensation bureau attempts to prosecute them. About 20 percent, I should guess, of the employers interviewed in that way did not carry workmen's compensation insurance. If the Pennsylvania experience is at all typical, it seems to me that is one of the big problems of workmen's compensation. We have always said, more or less theoretically, that a State law that does not have real teeth in it regarding compulsory insurance is not very much of a compensation law. Well, in addition to real teeth, we have to have an organization for prosecuting these uninsured employers. It has been our experience that we get very few prosecutions. The court will suspend sentence. We do not worry about that if the employers take out insurance and pay the awards. In some sections of the State we have not been able to get them to pay the costs of court. The courts have been, in a sense, even sentimental about these employers giving employment to their people, and say that if we prosecute them we will put so many people out of work. These are the problems we are trying to get at, and I think we have had some success through the methods I have indicated.

Mr. KJAER. The Department of Labor some time ago appointed a committee to formulate health and safety provisions for the N. R. A. codes. At the request of State employers, several of the safety committees of the code authorities were asked to include a clause calling for compulsory compensation insurance for all employees regardless of State exemptions, which shows the employers recognize the importance for fair competition, of having all of them covered by compulsory compensation insurance. We tried in several ways, but the N. R. A. legal division said we could not include such a clause as a health and safety measure; that while it might be very desirable to have that clause included in the codes, it could not be done under that procedure. So we had to give that up. It was possible it could be done, but it would not be regular. For instance, in Alabama, where an employer has less than 15 employees he does not have to come under the law. There is a possibility it might be

included in the N. R. A. code that the employer has to give a guaranty in some way so that the injured man will be paid money to take care of him regardless of whether or not the State has a compensation law.

Chairman ANGSTEN. Are there any other observations or questions at this time, any new problems other than State insurance?

Mr. JOHANNSEN. I hope the chairman will make a short statement on the recent Burns decision in Illinois, or don't you care to make that statement?

Chairman ANGSTEN. I can make a general statement. At this time I am very much in the air myself. Under the Illinois act we covered certain kinds of occupational diseases very specifically. Recently there has been a decision with reference to other occupational diseases. Following the famous Burns case decision there were immediately filed with the commission about 300 or 400 cases on occupational diseases. One attorney, I think, filed 150 cases. My fellow commissioner has taken a little kick at the attorneys, but I do not agree with him, although there are some attorneys whose practice ought to be looked into. I have in mind a certain attorney in our State who put an ad in the paper asking for marble cutters. I think about 200 marble cutters replied to that ad, and as they came in, he said to the healthy looking marble cutters, "You fill out this application for the job, and we will let you know when we need you." To the fellows who looked sickly he said, "You sit there"; then he took his pad and went to each one and said, "Where have you been working?" "I have been working for the United States Marble Co." "Where did you work before that?" "The Memorial Marble Co.", or some other marble company. "You weren't feeling well when you were there?" "I cannot say I was." "How do you feel now?" "I am not so hot now." "All right. You had better stay." As a result this attorney, who took it upon himself to act for these marble cutters—that is the inference we gather—has about 150 occupational disease cases that he is going to push under the Illinois law. We know that there are other attorneys who have gone down to the river cities and into the pool rooms to see the gangs around there. Seeing a fellow kind of dyspeptic looking the attorney would ask him where he had been working. "I have been working over in the stone quarry for the past year." "Do they have dust?" "Oh, yes." "Not feeling well, are you?" "No, I am not feeling so hot." Well, these attorneys have signed up another 150 occupational disease cases. After this Burns case we had 350 applications for adjustments or claims in dust silicosis cases. These cases are purely medical cases and it meant the employment by employers of 3 or 4 doctors, and considerable time and expense, so I gave the order not to set these cases for hearing. I called a conference of the carriers and told them the situation and asked for instructions.

We had a very spirited session. There were 150 to 175 carriers there, all very much agitated. From the conversations we had at that gathering it was decided that a typical case should be prepared with complete data, giving service, dates, etc. I have called another conference for October 8 for the plaintiffs' side—the injured men, the so-called applicants' side—and will call in the attorneys representing those people, and have an expression from that group. Still later I plan to call a meeting of the self-insurers, of whom we have quite a goodly

number—probably 20,000—and we will get an expression from them. But my purpose in calling this conference is twofold—to get enlightenment for the commission itself, and to give time for us to consider. The committee will be prepared to go ahead next month working on the agreed amendment to the act and changes to meet this situation. Whatever we have done in Illinois we have done by agreement. We have called in both sides, both the carriers and labor, and sat around the table; whenever there was any discussion of a substantial nature as to the act itself, other than procedure, it has come up in that way. It would please me immensely if we could continue these hearings until this committee will have a chance to meet. Our legislature meets in January, and I think if we could have an agreed rough draft at that time so that the legislature could act on it expeditiously, it would mean that the companies would be given time to prepare for this emergency; that the State of Illinois would be prepared to enlarge its staff and other things; and that the employers at large would have a chance to look around. That is our problem now in Illinois. This Burns case has started it, and we are trying to work it out.

Mr. DEANS (Virginia). Do you consider we should agitate any proposition—when has an employee occupational disease?—or should we look around and not agitate the question of occupational disease?

Mr. KJÆR. In connection with that I should like to call your attention to the committee appointed by the Secretary of Labor which is now working with the N. R. A. and the code authorities in trying to solve that proposition. We had a meeting of some of that committee with the crushed stone, sand and gravel, and slag committee. A few days ago an agreement was formulated between the two committees covering the quarrying and other dust producing methods which they are using. I think they agreed to physical examinations of the employees before employment and at periods during employment to try to eliminate the silicosis hazard. We are getting much safer regulations, and I think a great deal can be accomplished by that committee.

Of course, that does not cover the point Mr. Deans spoke about, but I think it is a step toward it. The cases that now exist are pretty hard to determine without physical examinations. I might say if they will agree to this physical examination, to be performed partially by the United States Public Health Service, which made a study of the coal miners in Pennsylvania recently and is doing excellent work trying to prevent these occupational diseases, mostly the silicosis kind which have come up lately, it will help greatly.

Chairman ANGSTEN. I think that that does not answer what you have in mind, Mr. Deans, but it is very illuminating.

Mr. HARTWIG (Oregon). Commenting on the question Mr. Deans asked a moment ago as to what various administrators of codes should do with respect to occupational diseases, I want to state that out in Oregon we will most likely have an amendment before the legislature providing for occupational diseases. We have an optional act, but today we are writing 95 percent of the workmen's compensation in the State, due primarily to our employers' liability law, which has some real teeth in it. The day before I left for the East a large group of men who operate boats on the various rivers

in Oregon came to our commission and asked us to cover them under the Jones Act. The insurance carriers are checking out on them under the Longshoremen and Harbor Workers' Act, and they are coming to us to write them coverage. The point I wanted to make, however, is this, that so far we have not recognized occupational diseases as such, although we make exceptions if there is some evidence of a group, or something like that. But several firms have recently had judgments against them; for instance, a large paper company was sued for a fibrous condition of the lungs brought on by inhalation of dry sulphur dust. The man made no claim under the act, and if he had made a claim we would have, of course, denied it under the circumstances, but he sued his employer and recovered a judgment for \$5,000. That employer is red hot for an amendment of the act, and I rather sense that he is going to try to get that amendment passed.

In the fruit and vegetable canneries there are various kinds of poisoning that we cannot cover, and the fruit employers are coming to us and asking us to instruct the legislature a little bit here and there, because they recognize the possibility of getting into hot water if something is not done about that. After all, in canneries, fruit poisoning is the greatest risk, as shown by the records, and if that is not covered the canneries are only half covered. The same is true in the furniture factories as to glue poisoning.

I look for some definite amendments to our act in Oregon, including occupational diseases to a limited extent, but how far it will go I do not know. I am convinced that we ought to have it, and that is how we feel about it out there. I do not know whether that answers Mr. Deans' question or not.

Mr. Roor (North Carolina). If the Supreme Court of Virginia should follow the recent decision of the Supreme Court of North Carolina his question would be answered for him.

In a recent case our commission denied compensation, and the Supreme Court held that in that particular case the claimant was entitled to compensation; that his disability was the result of an injury by accident, although it extended over a long period of time and it could not be definitely fixed as to when he became a victim of this disease. I think the decision was on the theory that the employer was negligent in not having provided reasonably safe places to work—the system was not up to date. Our supreme court held that where an occupational disease results from the employer's negligence, that constitutes an injury by accident.

Chairman ANGSTEN. Have you the citation on that?

Mr. HARTWIG. *McNelly v. North Carolina Asbestos Co.*

Chairman ANGSTEN. Are you satisfied, Mr. Deans?

Mr. DEANS. I do not think anyone has answered my question.

Chairman ANGSTEN. Will you ask it again?

Mr. DEANS. I asked the question: Is it advisable for those of us in States where the act does not include occupational diseases to agitate such question?

Mr. DEBEL. I will state the experience of Minnesota with occupational diseases. We have them listed. When this law was enacted in the 1921 session, and included occupational diseases, I imagine that

practically everybody involved in the framing of the law was totally ignorant of what this "occupational disease" meant. There are 25 or 26 occupational diseases listed. I have been 14 years on the commission and I think up to this date but two or three had occasion to file a claim. We have no coal mines, but we have practically the same situation as the gentleman from Oregon described, where the commission turned down a particular case because it was an occupational disease that was not listed in our law, and we, of course, cannot compensate for any disease that is not so listed. But this man, taking his case into court, obtained a verdict much more substantial than he would have been awarded had the commission been able legally to grant such an award.

I think that it would be more necessary to have occupational diseases in the workmen's compensation law than even a finger accident, or something that a person loses only temporarily. I was interested in the discussion on silicosis. Under the Civil Works Administration last winter we had about 40 or 50 cases of silicosis, but we did not get very far. We even employed the Mayo Clinic of Rochester, which is world famous. It gave us some light and knowledge, but so many of these occupational diseases are so baffling, even to the medical profession, that naturally the lay members of industrial commissions have rather a difficult time in determining them. I should say that a State ought to have occupational diseases listed in its law. I think we all find one particular occupational disease—lead poisoning is general. Of course, that is universal. That is something we have compensated for quite regularly, but our difficulty now is with silicosis and with carbon-monoxide poisoning. The question is whether or not a disease is an occupational one or is hereditary in nature. We have attempted, in the last two sessions of our legislature, to include in our law particularly the stone quarries, which are very strenuously resisting the inclusion of silicosis cases. If the N. R. A. is able to persuade these employers that they should consent to have the law so amended, well and good. Personally I am not very keen about the N. R. A. setting up any portion of the compensation law. I should say it would be a serious mistake to have a committee of employers or any other committee outside of the industrial commissions having jurisdiction over workmen's compensation. It appears to me that this subject matter ought to be under the industrial commissions.

Mr. SHARKEY (Washington, D. C.). The labor law information service of the Bureau of Labor Statistics has recently published a pamphlet showing the status of occupational diseases in all of the States. If any of the delegates are interested in receiving a copy of this report, we shall be glad to send it to him on request.

[Meeting adjourned.]

TUESDAY, SEPTEMBER 25—AFTERNOON SESSION

Chairman, G. W. SUPPIGER, Chairman Industrial Accident Board of Idaho

Chairman SUPPIGER. The first paper this afternoon is Control of Medical and Hospital Fees: Why and How? by Mr. John C. Root of the Industrial Commission of North Carolina.

Control of Medical and Hospital Fees: Why and How?

By JOHN C. ROOT, *Chief Claims Examiner North Carolina
Industrial Commission*

It is my purpose to show that charges for medical and hospital treatment in compensation cases should and can be controlled; that the control of such charges will accomplish a fuller and necessary expression of the philosophy out of which our compensation laws have grown. I hope also to show that there are practical reasons for exercising this control, and that fees for physicians and hospitals can best be passed upon by the commission or board charged with the responsibilities incident to the administration of the law—and without acting arbitrarily.

Why?

A workmen's compensation law is nothing more nor less than legal sanction of a compromise between employers and employees whereby both groups have ceded certain common-law rights in exchange for certainty and the security which certainty assures. The plan was so well conceived and has been so satisfactorily executed that the adjustment of industrial accident claims has for the most part become a matter of procedure, leaving no room for the activity of lawyers who seek speculative fees. It is a tribute to the legal profession that with but few exceptions its members have willingly sacrificed the prospects of large fees in compensation cases. No organization of lawyers in my State has ever adopted a resolution the terms of which would have required the industrial commission to ignore its duty under the law. I wish I could say as much for the medical profession. It would seem that doctors and hospital managers would acknowledge appreciation for the benefits secured to them by our compensation law. They do not hesitate to tell us that 40 to 60 percent of their cases are considered as charity patients, and that they are fortunate if they collect 60 percent from their private patients. Judging from the celerity with which the so-called group medical and hospitalization plans have recently been placed in operation in numerous communities throughout the Nation, and the serious consideration given the subject by local and State societies in practically all parts of the country, and the action taken

by the American College of Surgeons a few months ago, I am persuaded that the situation of the doctors and hospitals in all the States is quite as serious as in North Carolina. Surely, those who are interested in the perpetuity of our compensation laws have a right to expect doctors and hospitals to show by their charges that they do appreciate definite assurance of payment for their services, and that instead of insisting upon the old common-law right to "charge all the freight will bear" they would gladly and voluntarily submit to reasonable control of their fees in these cases.

Our North Carolina Industrial Commission is required to pass upon all medical and hospital bills, and the commission's approval of a bill is necessary before payment can lawfully be accepted. Most of our doctors and hospitals are satisfied with the fees which are approved for them, but there is a small group, woefully in the minority—but loud—who resent control of their fees in any manner whatsoever, and who accordingly persist in condemning both the Industrial Commission and the Workmen's Compensation Act. In this group many are to be found who are most active in the politics of their profession. I cannot persuade myself to accept the diagnosis made by a doctor who at the time he wrote to the chairman of our commission was president of our State Medical Society. He said: "The disposition to 'soak' the insurance companies is inherent in human nature and the physicians are human." A terrible confession that, or a sweeping indictment, as you may prefer to interpret that statement. It may be true of some doctors, but I have found the great majority of physicians to be strictly honorable.

It is elementary that a compensation law must require that employers and employees sacrifice old standards if the law is to be more than "sounding brass or a tinkling cymbal." That same principle of sacrifice is demanded of lawyers having any connection with compensation claims. There is no just reason for making an exception in favor of a doctor or hospital. They enjoy the same assurance of payment as is secured to injured employees and their attorneys. It should never be said of any social legislation that it imposes a tax upon employers and employees, subjects both to absolute control, provides no place for the damage-suit lawyer, but by the protection of uncontrolled privilege invites and rewards the damage-suit doctor. This statement will have no appeal to the administrator who is more political-minded than imbued with the philosophy of compensation. It can have no attraction for him who prefers to escape issues of principle but is satisfied to drift along in the questionable security which indifference affords. I assume that because you are concerned with the administration of laws which are social in nature and humanitarian in purpose your position is in the front ranks of the "New Dealers", and that you are not manacled by precedents of the old order but seriously determined to make the best use of every opportunity to contribute toward the shaping of a social order destined to evolve and to maintain the highest attainable degree of social justice.

There are practical reasons why medical and hospital costs in compensation cases should be subject to control. I venture the statement that a review of cases handled by any industrial commission or accident board would disclose the same need for such control as

has been revealed by the studies we have made in North Carolina. Our studies and observations argue most convincingly that from the standpoint of practicality control is not only advisable but necessary. A brief presentation of a few facts gathered from typical cases will elucidate what I mean.

Case no. 1.—Not aware that his patient was subject to the provisions of the Workmen's Compensation Act, the doctor rendered a bill in the amount of \$7.50 for full treatment. Upon learning that the case was covered by the compensation law, the doctor sent the insurance company a bill for \$21.

Case no. 2.—After having been treated for a week as an ambulatory case, the patient was called to the doctor's private hospital where, following an X-ray examination, a diagnosis of a fractured femur was made. There followed 26 days' hospitalization and the usual treatment for such a fracture. We requested that the X-ray films be submitted to us for examination. Expert roentgenologists confirmed our own findings which were that the films presented no evidence of a fracture other than as indicated by pin scratches on the surfaces of the films.

Case no. 3.—The doctor described his patient's injury as a laceration about 3 cm in length along the radial side of the left arm and about 2 mm in depth. Described in layman's English, the wound was slightly more than 1 inch long and about eight one-hundredths of an inch deep. In a conference with the doctor he admitted that he had treated a mere scratch, but his bill showed a charge of \$10 for first-aid treatment plus \$10 for six after-dressings, a total charge of \$20.

Case no. 4.—The patient had sustained minor burns on the left leg and was immediately placed in a hospital where he remained for 34 days. An investigation revealed that after the 15th day the attending physician applied only two dressings, and that during the last 19 days of hospitalization the patient himself dressed his leg most of the time.

Case no. 5.—The injured man had five fractured ribs on the right side and fractures of the right radius and ulna. The bill for treatment was for a period of 31 days during which time there were 15 X-ray examinations—3 of the chest and 12 of the arm. The charge for X-rays alone was \$95.

Case no. 6.—An employee while operating a bread-slicing machine received an injury described by the doctor as follows: "Incised wound involving nail on the small finger; also about one-half inch on the ring finger has been severed at its distal portion; this wound is not a transverse cut, but is in part longitudinal and transverse." Later the doctor reported that the injury involved no loss of bone. Treatment covered a period of 56 days, and after the 17th day the injured returned to work. The doctor's bill was \$73, which included a charge of \$3 for first aid and \$2 each for 35 subsequent office dressings.

Case no. 7.—The injury was a fractured os calcis. The patient was taken to a hospital immediately, where a cast was promptly applied. Hospitalization continued for 16 days notwithstanding there was no treatment other than observation during all that time.

Case no. 8.—An employee developed a streptococcal infection after having bruised his knee on a nail while working in a kneeling position. He was treated by the doctor for 97 days. There were 3 house visits during the first 5 days, 30 house visits during the following 10 days, and 2 visits daily the next 28 days. There followed daily visits for the next 33 days. Visits were not spaced until the patient was nearly ready to be discharged, when there were house visits July 1, 4, 9, 14, and 20. All visits—127 in number—were charged at \$3 each. In addition the doctor charged \$33 for bandages, antiseptics, and serum. The total bill was \$424. The medical and claims departments approved for the doctor a fee of \$261, allowing for 63 house visits and \$12 additional for unusual materials and serum. The doctor protested the reduction and a hearing was conducted by Chairman Allen who found that the treatment frequency was not justified and that the doctor had been allowed a reasonable fee.

Case no. 9.—The injury was a comminuted fracture of the olecranon process. The patient was kept in a hospital for 41 days. The hospital bill was approved in a greatly reduced amount, and a hearing was requested. The evidence pro-

duced at the hearing brought out the fact that while "boarding" at the hospital the patient was seen a number of times on the streets of the city, and had on two or three occasions visited the insurance company's office for the purpose of obtaining his compensation checks. Commissioner Dorsett approved a fee for 7 of the 41 days' hospitalization.

Case no. 10.—The accident resulted in the fracture of four ribs on the left side, contusions of the head, shoulder, and chest, and a comminuted fracture of the left ulna, middle third. The claimant was confined to a hospital for 26 days during all of which time he was attended by special nurses day and night. After the claimant (a married man) went home from the hospital, one of the nurses was retained for 24-hour duty for an additional 75 days. For this additional service the nurse submitted a bill in the amount of \$525, which was approved for payment in the sum of \$225 as the reports filed with the commission did not indicate that so much special nursing was necessary. A hearing was requested. After hearing the evidence, Commissioner Wilson found as a fact that not all of this service was reasonably required, that a part of the time the nurse served in the capacity of a chauffeur. Commissioner Wilson in writing his opinion called attention to the fact that the compensation law contemplates reasonably necessary treatment, but imposes no liability upon an employer for luxuries.

Case no. 11.—The injury was a sprained wrist sustained when the employee removed a suitcase from an overhead shelf. The attending physician's diagnosis was: "Sprain of the right wrist." After treatment at the doctor's office for 5 days, the patient was confined in a hospital for 50 days. Following discharge from the hospital office treatments continued for several months. During this treatment, and about 4 months after the accident, a surgeon performed an appendectomy and sent the insurance company a bill for \$150 on which was the statement: "Ruptured appendix, abscess as a result of infected wrist." The inference is that the surgeon, who occupies an official position in our State medical society, expected the insurance company to pay his bill and charge the amount to the employer's compensation loss experience. It did not.

A casual study of these few cases is sufficient to convince an impartial critic that an honest effort should be made to control the cost of treatment, and that among the many problems to be faced and dealt with are the following: (1) The disposition to charge more in a compensation case than in private practice. (2) Exaggerated diagnosis. (3) The use of technical terms which might mislead one not familiar with their meaning. (4) Unnecessary hospitalization, or hospitalization for a longer length of time than is required, either to serve the doctor's convenience or to indulge the patient. (5) Unnecessary X-ray examinations. (6) Excessive treatment frequency. (7) Nursing which is not a part of the necessary treatment. (8) Charging for the treatment of conditions having no connection with the accident.

We feel that our North Carolina Industrial Commission is indeed fortunate in that effort to control the cost of treatment has met with sympathetic cooperation on the part of most of the doctors. The fact that approximately 90 percent of the doctors submit bills which are approved without reduction is the best evidence of that cooperation. The doctors who present excessive bills constitute a small minority—a fact which presents another reason why all medical reports and bills should be carefully scrutinized and medical costs kept within reason. If the minority were not checked, the cooperative majority could justly complain that they were being discriminated against.

Another reason why there should be control of the cost of treatment is that the ratio of this cost to the total of the premium dollar allocated to cover loss experience is a factor in the adjustment of basic premium rates. This is always true, but of more importance in

these days of so-called depression when premiums are assessed against greatly reduced wage levels. Employers are now making smaller profits, employees are being paid lower wages, and compensation paid to injured employees is less because computed at the same percentage of the average wage as before wages were reduced. If compensation insurance rates are to be increased, it should not be on account of the excessive cost of medical treatment.

How?

Numerous methods have been proposed, and some of them have been given a trial, in an effort to control the cost of treatment. I have heard and read about the so-called "Utah plan" which has some advocates among the doctors of my State, including the immediate past president of our State medical society. I do not approve it because I understand that the commission is bound by a schedule of fees which is applied in all cases regardless of the injured employee's earnings. In my files I have a copy of a letter written by a member of the Utah commission explaining how the Utah schedule of fees was adopted and the manner in which it is used. In that letter there is a sentence which reads: "By this procedure the commission was entirely absolved from responsibility for any particular fee." I am informed that when the Utah commission questions a bill it is referred to the council of the State medical society, that the council fixes a time and place for a hearing before the council and the commission and a representative of the commission, opportunity being given the doctor, the insurance company, or self-insuring employer to be heard; but that the commission seldom takes part in the details of the controversy. Doubtless the plan operates successfully in Utah, but I could not recommend it for my State where we have so many more claims to handle and so many doctors with whom to deal. I am sure that our commission would never delegate to any council, whether composed of doctors or laymen, the power to pass upon medical bills, as under our statute this responsibility is the commission's. Many of our best doctors have said that they would not, for any conceivably available salary, serve either as a member of the commission or as a member of a committee, knowing that they were charged with the responsibility of passing upon medical bills, because if conscientious in the discharge of that duty they would necessarily make so many enemies that they could never hope to succeed thereafter in the practice of their profession. I believe that proper supervision and control, exercised without partiality or embarrassment, can be accomplished only by the industrial commission or accident board which by virtue of the law must be impartial, respecting all other matters arising out of compensation claims.

I was much interested in an article by Commissioner Elmer F. Andrews entitled "Workmen's Compensation Clinics", as published in the Industrial Bulletin of January 1934 by the New York State Department of Labor. The article began by stating, "Public attention has recently been drawn to certain abuses and racketeering in the medical treatment of injured and sick workers under the State compensation law." Commissioner Andrews referred to the Cullman committee report and Governor Roosevelt's comment that "the

elimination of professional abuses, in my opinion, is primarily the responsibility of the medical profession." I quite agree with Mr. Roosevelt, who is now our President. The responsibility is primarily that of the medical profession. I am confident, too, that Governor Roosevelt did not mean to imply that those administering the compensation law should have no responsibility in the matter. Administrators of the law should administer the law, and should be held accountable to the State, and their duties should never be delegated to one particular group among several groups affected by that law. Once the people, through their government, abdicate in favor of a self-governing class we will see the beginning of a process the results of which no present-day prophet can foretell. There was printed in the December 31, 1933, issue of the New York Times the text of compensation law changes urged on Governor Lehmann in a report of a committee of physicians. The report urged "that all obscure or difficult questions involving medical facts should be decided by physicians and not by lay judges"; that there should be appeal boards composed of physicians whose decisions should be conclusive. Since reading that report I have been expecting to hear that lawyers, teachers, stock brokers, bankers, bricklayers, and other craftsmen were insisting upon being the final arbiters in all matters involving the technic of their respective professions and trades.

There can be no effective or impartial regulation of the cost of treatment if the matter of adjusting fees is left to the insurance companies and self-insuring employers, as is so often recommended. Such a method is productive of abuses like those recently investigated in the State of New York, abuses which present problems more difficult to deal with if the administrative board or commission has no direct responsibility in connection with them. Why this is true was most ably stated in an address by Dr. Morris Rosenthal, formerly president of the Eastern Medical Society of New York, as published in the record of the Seventh National Conference on Social Security, the conference having been conducted April 19 and 20 of this year. Speaking of the Workmen's Compensation Act of New York State, the doctor says:

As you know, it was intended to cover the medical costs and the absence from work of those who are injured during employment. It was, of course, a new project and I am sorry to say that doctors didn't live up to their part of it. Since the insurance companies were paying for the injured employees the doctors—that is, a certain number of them—at first felt that the sky was the limit. It wasn't unusual to have a doctor bandage a fractured thumb or put a splint on it three times a day in some cases. As a result of that profiteering and exploitation on the part of the doctor, which was a result of the feeling on the part of the doctor that he didn't owe the same honesty to the insurance company as he owed to a private patient, the burden of the medical part of compensation became quite heavy. The insurance companies felt that they couldn't carry this heavy load. As a result of this attitude and also as a result of the business acumen of some doctors, private compensation clinics to which injured employees would come were formed for the purpose of getting as much money as they could out of this new sort of mine that was opened. That resulted in a great deal of difficulty. The doctors were discredited by the insurance companies and the compensation clinics started to flourish. When the clinics started they functioned with a fair degree of honesty, although, in order to get the patients, the clinic managers had to entertain representatives of the insurance companies and offer other inducements. But they went along fairly well until there developed various grades of these clinics, some of which were on a purely racketeering basis * * *

Another favorite plan involves agreement with the medical profession on a schedule of fees. This is now being tried in New York State. For an appraisal of the results being obtained I again quote from Dr. Rosenthal:

Under this agreement, however, other difficulties have arisen, which I think are inherent in any form of insurance. There is the question of the nature of the treatment. Was it the sort of condition that called for treatment under the reading of the policy? There is the question of overtreatment. If you pay the doctor by the visit, then he might be accused of overtreating his case. Was the treatment of the proper sort? So in actuality we have the same condition that existed before. We have doctors trying to sell themselves to the patients, just as they did in old times.

In my opinion the difficulties mentioned by Dr. Rosenthal are in part due to the fact that those administering the compensation law in his State are bound by a schedule of prearranged fees which admits of no flexibility whereby the charges to be approved could be made conformable to the patient's standard of living. A fee schedule which admits of no variation cannot prevent concealed overcharges in the form of excessive frequency of treatment.

In many of the States the compensation laws limit medical and hospital benefits to a certain sum, or limit them as to time, or both. Such provisions were doubtless made a part of those laws either to prevent or to cope with the difficulties so plainly pictured by Dr. Rosenthal, and to control the cost of medical treatment. If so, they have not succeeded. A member of an industrial commission in one of our Southern States has reported such practices as doctors charging \$85 or more for treating a slight injury when the work was reasonably worth \$5 or \$10. The medical limit in that State is \$100. But what else can be expected under such a law when frequently the doctor is called upon to treat a very serious case requiring months or years of skillful and constant care and be satisfied with a fee of \$100—and sometimes split that with a hospital—or after a few days refuse to have anything more to do with the case? I have recently made a study of the ratio of medical loss to compensation paid in each of the several States for each year during the 10-year period ending with the 1931 policy year. It shows that the medical loss ratio is no more favorable in States having limited medical benefits, except in certain States where the compensation laws are administered by the courts, and where I understand both doctors' bills and claims for compensation are frequently compromised. Yet we have some doctors in my State clamoring for a court administered law.

I would not pretend that our North Carolina workmen's compensation law is perfect, nor would I claim for it perfection in administration with respect to the control of medical and hospital fees. But we follow a plan which actually controls these fees. Fortunately for our plan the industrial commission is definitely charged with responsibility in these matters. I now quote section 64 of our act:

SECTION 64. (a) Fees for attorneys and physicians and charges of hospitals for services under this act shall be subject to the approval of the commission; but no physician shall be entitled to collect fees from an employer or insurance carrier until he has made the reports required by the industrial commission in connection with the case.

(b) Any person (1) who receives any fee, other consideration, or any gratuity on account of services so rendered, unless such consideration or gratuity is

approved by the commission or such court, or * * *, shall be guilty of a misdemeanor, and upon conviction thereof shall, for each offense, be punished by a fine of not more than \$500 or by imprisonment not to exceed 1 year or by both such fine and imprisonment.

Broad powers, you will say. Yes, but not powers to be exercised arbitrarily. Our legislature had the wisdom to save our commission from such embarrassment and to provide by statute a means of guidance in this important work. I quote section 26 of our compensation law:

SECTION 26. The pecuniary liability of the employer for medical, surgical, hospital service or other treatment required, when ordered by the commission, shall be limited to such charges as prevail in the same community for similar treatment of injured persons of a like standard of living when such treatment is paid for by the injured person, * * *.

In conjunction with committees representing the State Medical Society, the Hospital Association and the State Dental Society our commission worked out a schedule of fees. The fees agreed upon are not fees absolutely to be approved in all cases, but they are maximum fees and for guidance only. No schedule of invariable fees is permissible under our law, as we are by statute (sec. 26 just quoted) required to have regard for the patient's standard of living as reflecting his own ability to pay and as related to fees usually charged in his own community. Similar provisions are to be found in other compensation laws. So, we do not claim that our legislature has given expression to a new or original plan through having required doctors and hospitals to be paid in accordance with the patient's standard of living. We all know that many doctors are guided by that principle in their private practice—in which respect the distinguished Mayo brothers do not stand alone. The idea found statutory expression more than 4,000 years ago. The Code of Hammurabi, B.C. 2250, which was the foundation of all lawmaking in Babylonia from about the middle of the twenty-third century B.C. to the fall of the empire, contained some interesting provisions, a few of which I quote:

No. 215. If a physician make a large incision with an operating knife and cure it, or if he open a tumor (over the eye) with an operating knife, and saves the eye, he shall receive 10 shekels in money.

No. 216. If the patient be a freed man, he receives 5 shekels.

No. 217. If he be the slave of someone, the owner shall give the physician 2 shekels.

No. 218. If a physician make a large incision with an operating knife, and kill him, or open a tumor with an operating knife, and cut out the eye, his hands shall be cut off.

No. 219. If a physician make a large incision in the slave of a freed man, and kill him, he shall replace the slave with another slave.

No. 220. If he had opened a tumor with an operating knife, and put out his eye, he shall pay for his value.

(Vol. 1, *The Great Events by Famous Historians*, Rossiter Johnson, LL.D., editor-in-chief, published by The National Alumni. Copyright 1905.)

We would not restrict doctors to these identical fees, nor would we recommend the same penalties for failure to cure, or for malpractice. But the making of allowances for the social status of the patient in the matter of charges for professional services is sound and just. In this connection let us consider a few facts. Compensation insurance premiums are not collected on the basis of so many dollars per year per man, as in the case of other forms of insurance.

The premium is a certain percentage of the employer's pay roll. Let us imagine two employees in the same insurance classification, one of whom by reason of peculiar skill and much experience or because he is a journeyman craftsman, is paid \$30 a week for his services, the other because of inexperience or suffering from some other handicap or because he is an apprentice, is paid \$10 a week. The insurance company collected on the \$10 man just one-third the amount collected on the \$30 man. This should be sufficient argument in support of the principle that so long as existing underwriting methods prevail, the doctor should be paid less for treating the \$10 man than for treating the \$30 man. There is also to be considered the patient's marital status and the number of persons dependent upon him for support. It is true that attempts will be made by some doctors to escape the effects of a flexible schedule of fees. That has been our experience in North Carolina. In certain of our district medical societies resolutions were proposed to increase minimum fees to the level of the commission's maximum fees. These were attempts to out-legislate the legislature and to oust the industrial commission of its jurisdiction. They accomplished nothing. In my office I have a file in which I keep, in alphabetical order by towns, the charges usually made by doctors for office, hospital, and house visits—day or night. I have copies of some of the district fee schedules. Of more than a little interest to us is the fee schedule of a railroad company operating extensively in our State and throughout the South, the fees therein listed being on the whole much lower than those usually approved by the industrial commission. All of this information is helpful to us in our work, and we are constantly adding to it.

The danger in a schedule of absolute fees cannot be too greatly stressed. That there is a strong movement in favor of such a plan. I bring to witness *Medical Economics*, which styles itself "The business magazine of the medical profession", and which is published in Rutherford, N.J. It recently published an elaborate schedule of medical and laboratory fees. The fees as listed were said to have been computed for the most part by averaging the minimum fees quoted by more than 100 medical societies. Each fee was "an average minimum fee", and to quote the foreword, "may be considered to reflect the recommended charges of the American medical profession as a whole." Consider a few of these recommended minimum fees:

Intravenous medication with salvarsan.....	\$12
Blood culture.....	10
Amputation of arm at shoulder.....	139
Amputation—forearm.....	75
Amputation—arm (unspecified).....	87
Amputation at hip.....	205
Herniotomy—single hernia.....	93
Repair of ventral hernia.....	150
Application of plaster cast.....	25
Fracture, open reduction of (bone unspecified).....	100

Acknowledge these as minimum fees and employers will find the cost of compensation insurance prohibitive, and as a result there will be an irresistible demand for the repeal of every compensation law in this country in less than a year. Truly there are some doctors who would "kill the goose that laid the golden egg", the only law that ever actually put money into the pockets of the doctors.

Given a law that requires the commission or board to pass upon medical and hospital bills, the next requisite is a rational and workable procedure. No duty should be performed either arbitrarily or perfunctorily. We believe that our commission has worked out a method that assures proper consideration for the doctor or hospital, the employer and the insurance carrier. Each day all bills are placed in the hands of a filing clerk who combines them with their appropriate files and brings them to my desk. I then review each bill, noting the charge for first-aid treatment, the number of treatments after first aid, the charge per treatment, the number of X-ray examinations and the charge and necessity therefor, and whether treatment was exclusively at the doctor's office, or if there were house visits charged by the doctor, or hospitalization. All bills that are obviously reasonable are immediately approved and, together with the files, are promptly referred to a clerk who issues what is called our authorization letters in quadruplicate. The original and one copy are mailed to the insurance carrier so that the carrier can attach the original to its draft when making payment to the doctor or hospital. That leaves a copy for the carrier's file. We retain two copies, one of which is placed in our file with the bill to which it relates; the other is placed in a permanent file with others of its kind. These authorization letters are numbered serially and are to be found in numerical order in the permanent file.

Bills about which there is any question are placed to one side to await our medical examiner's daily call at 11 o'clock each morning. When our doctor comes to the office we begin a joint review of the entire file pertaining to each case. I read from the accident report when and how the claimant was injured, his average weekly wage, the number of his dependents, how much (if any) time was lost from work. From the attending physician's first report I read the description of the injury and inform our doctor how much time elapsed between the accident and the physician's first treatment—if both did not occur on the same day. Also, I read the description of what was done on the occasion of first-aid treatment. Then I turn to the physician's final report and bill from which I read the description of any operations performed as well as the doctor's statement about any complications which may have developed. The date of each treatment, and whether at the office, home, or hospital, is noted, as well as the per-treatment charge and the total charge. This gives our doctor a mental picture of the patient, his injury, the treatment, and the charge for treatment. He then expresses his opinion as to whether the bill should be approved as rendered or in a less amount. He does not know the name of the doctor whose bill is under consideration, nor the name of the patient, employer, or insurance company interested in the case, a fact which assures like treatment for all. These conferences with our medical director last from 30 minutes to 2 hours each day.

All bills are considered and authorizations issued the day the bills are received, except for the occasional bill which requires that we have some additional information from either the physician, the insurance company, the employer, or the patient before it can be given intelligent consideration. In each authorization letter there is a paragraph plainly stating that if any interested party is not satisfied that a reasonable fee has been approved he may petition

the commission for a hearing. The number of requests for such hearings has been small. Most often the hearing commissioners have approved the action of the medical and claims departments, frequently larger fees have been awarded, and occasionally a commissioner has ordered a further reduction in a bill. These decisions by our commissioners are sufficient proof that a doctor who is dissatisfied with the fee first approved for him is assured of an impartial hearing if he wishes to protest against the reduction of his fee.

The plan which we have followed in North Carolina, with apparent success and which I recommend to you, requires: First, that the law make it the business of the commission or board to control the cost of medical treatment; second, that the law require fees to be paid in accordance with the patient's standard of living; third, that the law limit liability to only such treatment as is reasonably necessary; fourth, that each bill be given individual consideration in connection with the history of the case to which it relates; fifth, that bills be passed upon without delay; sixth, that the physician, employer, and insurance carrier have the privilege of appealing to the commission or board if not satisfied with the action originally taken.

DISCUSSION

Chairman SUPPGER. The discussion on this able and interesting paper will be led by Mrs. Emma S. Tousant, member of the Department of Industrial Accidents of Massachusetts.

Mrs. TOUSANT. I want to congratulate Mr. Root for the very excellent paper he has written for us. He has made very clear the situation which they met in North Carolina, and it is not my purpose to criticize his paper either destructively or constructively, but perhaps to compare the law of North Carolina with our Massachusetts law, and to compare their problems with our problems. We are fortunate in Massachusetts, we believe, because we have a medical adviser, a person who is to assist and who does assist the board in handling these questions. We feel that with his advice we handle them as equitably as possible.

I understand it was once said that our medical adviser was a very clever man, that he discovered that a doctor made a diagnosis of a neurosis when he was diagnostically destitute. So he assists us, when we are diagnostically destitute, in determining the adequate and proper fee.

The services of a doctor, as you all know, are something more tangible than the services of a lawyer. A person feels that he gets something from a doctor, because a doctor gives a person something that he can see. When a lawyer renders services he may put just as much time, or a little bit more, into his work, yet the person cannot see what is being done. Therefore, his fee seems very, very much too large, while this same person is perfectly satisfied to pay the doctor, because he has a nice personality. The doctor was so kind, and the mere fact that he called made the patient feel so much better. Therefore this presents a problem which confronts the Department of Industrial Accidents of Massachusetts, as it does all other boards, because the employee is oftentimes desirous of paying more than a fair and proper fee.

The doctors are human, more human sometimes than lawyers, and much more human than the industrial accident commissioners in many cases. It is only reasonable, therefore, to expect that in the profession there will be a certain number which have a disposition to charge more in compensation cases than in private practice, because they know they are going to get their money. If there is anything coming, people always go after it. If there is anything to be given out for nothing, everyone is sure to be there. Exaggerated diagnosis is another human element that we must expect. Unnecessary hospitalization, or hospitalization for a longer length of time than is required, either to serve the doctor's convenience or to indulge the patient, is a possibility.

Now about unnecessary X-ray examinations. I cannot believe that we have so much trouble with them, because with the present status of the science of medicine, it is necessary, through the process of elimination, to make X-ray studies and to take X-ray photographs.

Excessive treatment frequency—that is one of our troubles. Now as to nursing, which is not a part of the necessary treatment, we have very little trouble there, and as to charging for the treatment of conditions having no connection with the accident, that is a matter of opinion.

Now as to this other reason why there should be control of the cost of treatment, that the ratio of this cost to the total of the premium dollar allocated to cover loss experience is a factor in the adjustment of basic premium rates, that is one of the major reasons, if I may say it, why an industrial accident board should have actual control of the medical fees. The experience of Massachusetts indicates, first, that taking the doctors as far as possible into the confidence of the commission works very much better, because they know the aim and purpose; and second, that doctors as a class who have been handling common-law cases are in the habit of charging extra on those cases because they think that if they are going to get a fair and reasonable fee they have to double that fee, as they do not believe they will ever be able to collect and they seldom are able to collect.

Another item that might and does make for trouble is the fact that in many cases insurance companies have paid a goodwill price to doctors, which does not go under workmen's compensation. In Massachusetts that difficulty was realized in 1912 or 1913, when the act first went into effect. We had a medical advisory committee which formulated certain principles, and acceptance by the medical profession is the basis of an elastic industrial rate, rather than a fee table such as you have been hearing about this afternoon, which would not work equally well throughout the Commonwealth.

The hospital medical advisory committee aided also, in the beginning, in formulating rules for hospitals. The rule in this is fairly simple—that the insuring company shall not be charged a greater rate than is charged to the uninsured, which allows a certain amount of elasticity. I want to repeat that, that the insuring company shall not be charged a greater rate than is charged to the uninsured. Our law provided for a period that the insurers should pay the first two weeks' medical cost. Then there was an amendment to the act, that in cases which required specialized or surgical treatment the insurer should pay for a longer period, but should pay a reasonable amount, to be determined by the commission. That has worked out very well.

The supreme court has told us what an unusual case is, or, rather, what an unusual case is not—I do not know that we have ever found out what an unusual case is—and because of that there was put into the law a clause providing for specialized or surgical treatment. At that time we had a meeting of this advisory committee to determine what should be considered specialized or surgical treatment, whether or not specialized treatment was to be determined by a man who could get up and give us his qualifications as a specialist and would admit he was a specialist, etc., or whether, aided by his experience and qualification, it was to be left to the board.

I will tell you in detail our routine method. We did not at first have authority over the hospitals, but this last year there was an amendment to our act, which provides that fees of attorneys and physicians and charges of hospitals for services under this chapter shall be subject to the approval of the department. That gave us authority over hospitals, which we had assumed but which the law never quite clearly gave us.

Now just for a little practical working of the Massachusetts compensation law insofar as the medical cost is concerned. In case the insurance company is satisfied, the medical bill does not necessarily come to our attention. The company pays it. If the bill is reasonable and probably in accordance with what we would consider reasonable, that is the way it is handled. If the company does not pay it, the bill is sent in. Our medical adviser goes over the bill, goes over the files, and determines what, in his opinion, a reasonable fee for that service by that doctor would be. We allow him to send out an informal opinion, which is not binding upon anyone, but the insurance company or the employee may accept that informal opinion, and that is the end of the case, as far as the medical cost goes, for us.

If the company does not accept it, then the doctor or the employee may ask for a hearing. The doctor testifies as to the services rendered, or if it be a hospital or a nurse, they testify—a regular hearing—and the board member reports that evidence to the board, making a recommendation for a finding. The board usually follows the recommendation of the single member, and sends out a definite finding as to the amount of the bill, as to the reasonableness of the fee.

We do not have a fee table. We feel that it would be unfair to the doctors, to the employees, and to the insurance companies to say that any doctor that you can get that is registered to practice in this Commonwealth shall charge, or may charge rather, a certain amount for cutting off a finger, or a certain amount for doing a hernia operation. On the other hand, we may give the doctor a set amount that we consider reasonable; that is, reasonable for such an operation. We may feel that that operation was not necessary and not give him anything. It is entirely up to the commission, and I cannot conceive of any law which would work satisfactorily to every constituent—employer, employee, or insurance company and doctors—which could be administered by any other group than the commissioners who are appointed to administer the compensation law. For that reason we feel that we treat the doctors fairly. We have very little complaint.

I should like to ask the gentlemen from North Carolina if they have a medical adviser.

Mr. ROOT. We do.

Mrs. TOUSANT. Are there any questions on our Massachusetts procedure?

Mr. HOROWITZ (Massachusetts). Mrs. Tousant, what do you think of the suggestion of John C. Root that the medical adviser, the medical examiner, should not know first, the name of the insured; second, the name of the employee, and, third, other facts which in Massachusetts, our medical adviser does know before he passes upon the bill? What do you think of the idea that he should not even know the name of the doctor?

Mrs. TOUSANT. I think it would be unfair to trick anybody into giving an opinion like that. I think it would be unfair in trying a case to have the jury behind a screen and merely let the jury hear the voice of the person testifying. I think it would be unfair to the medical adviser, to the insurer, and to the employee, if an opinion was obtained through that method. I do not mean to say that the State of North Carolina is unfair to its medical examiner, but that would be my reaction—that no person under our law could give a fair opinion who did not know who the party was who did the job, any more than the accident board could give a fair fee to an attorney, not knowing who that attorney was.

Mr. DORSETT (North Carolina). Why should it make any difference in passing upon a bill whether or not the American Mutual Liability Insurance Co. or the American Telephone & Telegraph Co. is paying it? What good would it do the doctor to know that?

Mrs. TOUSANT. It would not make any difference, and that was not the angle from which I was speaking. I would feel just as well satisfied if the industrial accident board did not know what insurance company these people represented. I do not think that that has any bearing whatsoever upon the matter. I do not think it has any bearing on the opinion of the medical examiner.

Mr. DORSETT. With reference to passing upon a bill then, what good is it going to do our doctors to know whether it is John Jones or Bill Smith who treated the man?

Mrs. TOUSANT. Simply because Bill Smith might be a doctor who would call twice a day, and if it was possible to perform an operation he would perform that operation. Then if it was possible for him to have another operation, with a neurosis following that, that is what would happen, and probably it would be an unreasonable situation. That is the thing that we have to watch.

Mr. DORSETT. By that method, then, you are trying, *ex parte* and behind the screen, the ability of John Jones and Bill Smith.

Mrs. TOUSANT. No; we are not. In Massachusetts the medical advisor merely gives an informal opinion, which may or may not be accepted. If it is not accepted, then it comes before the commissioner. The commissioner may ask his opinion upon the evidence, or he may not. More often he does not.

Mr. HARTWIG (Oregon). In Oregon we have a fee schedule published by the State medical society, which the commission uses but exercises its own judgment in deducting different amounts, depending on the type of bill that has been rendered, and by the way, I want to say that we have very materially reduced our medical charges per case. In addition to that, however, and I think it has probably been more responsible than any other one influence in reducing the cost, is the fact that about 2 years ago the State medical society did this. At a legislative session an attempt was made to stop the commission in various ways, but fortunately we won out. Following that the State medical society appointed a liaison committee, composed of three doctors, usually an orthopedic, a surgeon, and a general practitioner. These doctors are chosen from a list of 15 or 16 names furnished by the society to the State industrial accident board. That group of three meets periodically with the commission or its representative, usually with our chief claim agent. Here is one point that is interesting, which has been touched upon here in line with a question which was asked a moment ago. The doctors themselves have requested that they be not informed as to whose bills they are passing upon, nor what case they are passing upon, nor who the employer involved is; so the claim agent, who has the files before him, reads the records. He says, for instance, "Here is case no. 1 for today, involving a fracture of the femur, or whatever it may be, and this was handled in this way, and this was done, and that was done, and this is what was charged."

Then the doctors—remember, they do not know who the doctor is, and they do not know who the individual is—proceed to analyze the individual record as it is read to them, and to indicate whether or not in their opinion an excessive charge was made. It is very interesting. They start cutting their unknown colleague's bill to pieces, sometimes, and out of it comes a very much reduced charge. Then the doctor in question is notified that the bill has been reduced, and that it has been passed upon by the liaison committee. To date we have not had a single come-back—not one single doctor has ever come back and undertaken to challenge that reduction. In fact, the doctors have been just as quiet as anyone could possibly be under those circumstances. Under our arrangement, if the doctor objects he has the right to appeal, and he has the right to go before the liaison committee and fight it out, but none of them has tackled that job yet, because they do not want to go up against the gun that way. We find that has been a most satisfactory arrangement.

Mr. STEWART (Washington, D. C.). It has been the practice for a number of years to include in these proceedings a record of the labor legislation and the court decisions affecting labor occurring during the year. Formerly this was made a part of the president's address. For the last 2 or 3 years that has not been done. To my mind it is exceedingly important to have that information in the proceedings, and I would like to present it and have it put into the record.

Chairman SUPPGER. If there are no objections, that information will be made a part of the record.

General Review of Workmen's Compensation Legislation, Etc., in 1934

By CHARLES F. SHARKEY, of the United States Bureau of Labor Statistics

A year ago it was our privilege to meet in Chicago and receive the hospitality of the city engaged in celebrating a Century of Progress. While we cannot boast of a century of progress in the principle of workmen's compensation in the United States, nevertheless, during the past 25 years we have witnessed a steady growth in the enactment of such laws and have now firmly passed from the theoretical stage to the practical. Over 30 years ago the Massachusetts Legislature appointed an investigative commission to study the subject, though no legislative results immediately followed. However, this State continued its interest and study of the subject, and was among the first to adopt such laws. A slow but steady progress has been made in this country toward improving the laws. In some States an opportunity is presented annually to amend the laws, but in other States the legislatures are limited to biennial sessions unless called by the governors in the interim.

During the present year only nine States have convened in regular legislative session—Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia. All seven of these States having workmen's compensation laws on their statute books made some change in the basic law. While Mississippi and South Carolina had an opportunity to be included among the States which have enacted laws supplanting the common-law theory of employers' liability, they, nevertheless, failed to take definite, positive action and the score still stands 44 to 4—44 States with workmen's compensation laws and 4 without—Arkansas and Florida completing the number of minority States. It should be said, however, that signs of greater public opinion for the enactment of such laws are being displayed and it is hoped that the sentiment will soon crystalize into a reality.

In at least 20 States the governor has called the legislature into special or extraordinary session. In most cases such call has been for the purpose of enacting emergency legislation or the appropriation of funds for relief purposes. In only two States (Michigan and Ohio) did the legislature consider the subject of workmen's compensation. In Michigan a new method of taking a judgment resulted. After an award of compensation has become due and unpaid for 8 days, the department of labor may, upon the request of either party or upon its own motion, give to the opposite party and to the insurance carrier 7 days' written notice of the certificate of judgment. If such is still unpaid upon the expiration of 7 days the department must issue its certificate to the circuit court, and upon the payment of a specified filing fee, a judgment must be rendered by the court. The judgment of such court may be reviewed by the supreme court of the State only upon questions of law. It is reported from this State that the new method of taking a judgment has been found to operate successfully. By an act of the Legislature of Ohio, approved by the governor on May 4, the industrial commission of that State was given full power and authority to administer the workmen's compensation law.

The Kentucky Legislature has extended to employers engaged in the operation of glass-manufacturing plants, quarries, sand mines, etc., the right voluntarily to subject themselves to coverage under the workmen's compensation act for the disease of silicosis. The legislature, however, has thrown about the privilege certain qualifications and limitations. An application for compensation on account of such disease must be filed within 1 year after the last injurious exposure to silicosis and the employee must not have been guilty of any misconduct, as defined, in its relation to recovery. The board must in all cases appoint disinterested physicians to examine the employee, and the findings must be certified to the workmen's compensation board.

During the year the reports of two commissions appointed to study silicosis were made public. The reports of New Jersey and Massachusetts stress the great need of expert impartial diagnostic advice by medical men thoroughly versed in the pathology of the lungs. In Massachusetts the commission's recommendation for the creation of a division of occupational hygiene received the approval of the legislature under the provisions of chapter 331, acts of 1934, establishing such a division under the department of labor.

In addition to an extension of coverage of employees under the Kentucky act, the legislature of Rhode Island made the act applicable to members of the State National Guard.

The only act passed in Virginia was one correcting the wording of the compensation law in relation to the maximum compensation period for marked disfigurement of the head or face.

Massachusetts has provided for prompt payment of workmen's compensation in certain cases under the provisions of chapter 252. If the insurers cannot agree that the injured employee is entitled to compensation, priority must be given by the department of industrial accidents to the hearing of such cases to determine the question of liability and hence to expedite the payment of awards. The surviving children of the employee are benefited by an amendment (ch. 250) to the basic act. Hereafter in this State, if there is no surviving wife or husband of a deceased employee, the amount which would have been payable to or for the use of a widow and for the benefit of the children shall be paid in equal shares to all surviving children of the employee. All violations of certain sections of the child-labor law must hereafter be reported to the department of industrial accidents. Such violations constitute a serious and willful misconduct under the section of the law requiring the payment of double compensation for illegally employed persons.

The subject of coverage of relief workers has continued to perplex the courts and administrators of workmen's compensation laws. New Jersey extended until January 31, 1935, a law passed in 1933 declaring all relief employments to be casual employment and therefore not covered by the workmen's compensation act. New York also considered this problem, and excluded "work relief" employees from coverage under the workmen's compensation law. While this class of workers were excluded as public employees under the act, the legislature, however, enacted a special law to take care of such workers engaged on relief projects. These workers are furnished family relief, medical services, and an allowance of \$3,500 exclusive of funeral benefits in event of death or permanent disability. The plan is di-

rected by the Temporary Emergency Relief Administration but may enlist the services and cooperation of the industrial commissioner in the conduct of medical examinations. Funds from the relief appropriations are set aside to defray the necessary compensation costs.

The program committee has very wisely considered this subject of sufficient importance for studious thought and worthy of a place on the agenda of this convention. Prior to last April, awards of compensation for injuries to employees engaged on a Civil Works Administration project were paid from Federal funds and the administration of the benefits was placed under the United States Employees' Compensation Commission. Since April 1, the control and burden of work-relief projects has been placed on the State and local relief authorities. As a result, added confusion and more complex problems have made it difficult, if not impossible, to effect a just and equitable solution. I recently learned of a plan of benefits for employees injured under a certain State emergency relief administration, which was dubbed a "gratuity" plan. After briefly describing the scope and meaning of "traumatic injury" and establishing a waiting period, a schedule of specific losses was enumerated in the following language:

For specific losses indicated hereunder the following schedule of awards shall be made, predicated upon 50 percent of wages which an employee would have earned on the certified work basis during the calendar month in which he was injured, subject to a maximum of \$20 per month.

And then the schedule of specific losses followed; a few of them will be sufficient to show the utter folly of such a plan. Loss of sight of eye, 12 months; loss of arm, 25 months; loss of leg, 24 months; loss of hand, 20 months; loss of foot, 16 months. Maximum death awards, the plan states, "shall be limited to 36 months regardless of the number of dependents." And then, the injured employee is admonished that "the services of an attorney will not be required to collect these benefits." Again if collection is sought through an attorney at law or through the courts any award contemplated in the plan will not be paid by the administration.

Reverting briefly again to the changes in the New York workmen's compensation law by the legislature in 1934, several acts were adopted liberalizing the law and extending occupational disease coverage for dermatitis caused by use of or direct contact with brick, cement, lime, concrete, or mortar.

Following our meeting last year several State legislatures were called into extra session. In one or two cases workmen's compensation legislation was enacted. Kansas passed two acts, one in relation to the computation of the average weekly wage (ch. 74) and the other concerning the premium rates for workmen's compensation insurance (ch. 75). The legislature of Oregon also considered this latter subject at a special called session. Minnesota amended the law relative to payments into the compensation fund.

Two territorial legislatures met during the year—Puerto Rico and the Philippine Islands. The former made no changes in the basic workmen's compensation law, while the Legislature of the Philippine Islands is now in session, and no official information has been received as to whether changes have been made or are contemplated.

With the exception of an amendment to the Federal Longshoremen's and Harbor Workers' Compensation Act of 1927, authorizing United States district attorneys to represent the United States Employees' Compensation Commission, the act has remained unchanged until this year. The Congress at the last session adopted several amendments to the basic act. The recent changes give the deputy commissioner the power to suspend payments whenever an employee unreasonably refuses medical or surgical treatment, and also extends the period for modification of award. Hereafter in permanent partial disability cases, compensation shall be paid during the entire healing period, in addition to other benefits listed in the schedule. However, the cost to the insured will not be increased as the scheduled benefit period has been decreased in each case. The Congress by virtue of another act gave to the Superintendent of Insurance of the District of Columbia jurisdiction over premium rates, and petitions for increase, etc., of same. Insurance carriers in the District of Columbia insuring employers against liability for compensation under the District of Columbia workmen's compensation act must hereafter file a manual of classifications and underwriting rules, together with basic rates, etc.

Legislation—Canada

Eight Canadian Provinces with workmen's compensation laws met in legislative assembly during the year. Of this number, however, only two Provinces (Nova Scotia and Saskatchewan) changed the basic law. The time within which a workman must report a hernia has been increased from 24 hours to 72 hours in Saskatchewan. In this Province also the occupational disease schedule was enlarged so as to include dermatitis due to employment in any process involving the use of or direct contact with acids and alkalies or acids and oils capable of causing dermatitis. This provision is identical with that which was added to the Ontario Workmen's Compensation Act in 1932.

The Nova Scotia act was amended in several respects. The Labour Gazette (August 1934, p. 748) reports the following changes: An amendment to the workmen's compensation act provides that average earnings and earning capacity shall not be below \$10 per week in disability cases. The provision applies only to accidents happening after the passing of the amendment (May 2, 1934) and in cases where the workmen's rate of remuneration is such that if he had worked 6 days a week his earnings would have been at least \$10 per week. In cases of total disability, however, the amount of compensation heretofore payable is not to be reduced by virtue of the amending act. Compensation for disability is 60 percent of average earnings or of diminution of average earnings, as the case may be, so that the minimum payment in total disability cases covered by the amendment will be \$6 per week. Formerly the minimum for permanent total disablement was \$5 per week unless the average earnings of the workman were less than that amount, when compensation equal to average earnings was paid.

A further amendment provides that medical aid shall not be supplied for a longer period than 30 days and that such period shall not extend beyond 60 days from the date of disability. Formerly, the

workman was entitled to medical aid only during the period of 30 days from the date of disability.

A new clause provides that where an objection by a person entitled to object has been made to the board against a claim that has been filed with the board, an inquiry shall be held at the earliest convenient date and in any case within 45 days after the lodging of such objection.

Court Decisions

The courts of the Nation continue to hand down decisions involving workmen's compensation.

A case from an Ohio court reached the United States Supreme Court, which held that an agreement between a railroad and a switchman to have their rights and liabilities governed by the State compensation law prevents recovery in an action under the Safety-Appliance Act (*Gilvary v. Cuyahoga Valley Ry. Co.*, 54 Sup. Ct. 573).

Prior to the injury the employee, together with others, voluntarily agreed to be insured under the workmen's compensation act. The agreement was approved by the commission and insurance premiums were paid by the employer. The lower court in Ohio held that the agreement to be bound by the State law was not sufficient to prevent recovery under the State Appliance Act and gave a judgment to the employee. The court of appeals reversed the decision "for the reason that the acceptance and notice of election by the employee contract, approved by the Industrial Commission of Ohio, is a complete bar to a right of recovery in this action." The State supreme court affirmed this decision.

Upon appeal to the Nation's highest court it was held that Congress may exert its power to exclude and supersede State legislation upon a subject, but, on the other hand, a part of the subject may be left open to State regulation. The intent to regulate exclusively need not be specifically declared, but "such intention will not be implied unless, when fairly interpreted, the Federal measure is plainly inconsistent with State regulation of the same matter."

The violation of the safety-appliance acts was held to be a breach of duty to the employee, and the right to recover damages "sprang from the principles of common law", but "these acts do not create, prescribe the measure, or govern the enforcement of, the liability arising from the breach. They do not extend to the field occupied by the State compensation act."

The United States Supreme Court therefore held that the election of the employee to be covered by the State compensation law was a bar to a right of recovery under the Federal act.

In a case arising in Maine, the supreme judicial court of that State held that the operator of a motor vehicle without a license does not bar recovery for injury (*Kimball's case*, 168 Atl. 871). In the first instance of the widow's claim for compensation, the commissioner dismissed the petition and held that the employee was not in the place where his duties required him to be and hence was not in the course of his employment. The lower State court sustained the holding of the administrative official. The high court of the State reversed the lower court. The court held that the right of recovery for the injury was not barred by the fact that the plaintiff was op-

erating the motorcycle illegally, unless such operation was a direct cause contributing to the injury, saying that—

Where the employment requires the employee to travel on the highway, and accident causes injury to the latter when he is using the highway in pursuance of his employment, or in doing some act incidental to his employment, with knowledge and approval of his employer, such injury is compensable.

Continuing, the court said:

We think that the operation of a car without a license, while it is a punishable act, does not render the operator a trespasser on the highway, but that the illegal element in the act is only the failure to have a license while operating it, so that if the operation and movement contributed to the accident with which the want of a license had no connection, except as a mere condition, they would not preclude the operator as a plaintiff from recovery.

If the illegal quality of the act had no tendency to cause the accident, the fact that the act is punishable because of the illegality ought not to preclude one from recovery for harmful results to which, without negligence, the innocent features of the act alone contributed.

The supreme court of New Jersey held that a household worker who had been employed to do housework for one or more days per week over a period of 10 years was engaged in "recurring" employment and was not a "casual" employee (*Harrington v. Garrison*, 168 Atl. 166).

A skilled houseworker was injured in the home of her employer. She worked from 1 to 3 days every week. The deputy commissioner of the workmen's compensation board held that the houseworker was entitled to compensation under the act, and this opinion was sustained by the lower court. The employer appealed the decision, contending that the employment was merely casual, not in connection with the employer's business, and not "regular, periodic or recurring", and therefore the injury was not compensable.

The Supreme Court of New Jersey affirmed the decision of the lower court as follows:

Without attempting to determine whether Mrs. Garrison's status as a housewife was a business within the meaning of the statute, we state our conclusion that the employment was at least "recurring." * * *

Miss Harrington was in effect a part-time servant in the prosecutor's employ, and her service had at least this degree of regularity that the employment was for a part of every week that the Garrisons were at home over a long period of years and for a minimum of 1 day in each of those weeks. In this long repetition of weekly service, in the acceptance of it as a regularly recurring fact, and in the mutual expectation of continuation, we find a condition utterly at variance with the common understanding of, as well as with the statutory definition of, a casual employment.

Compensation was denied for the death of a school teacher killed en route to school in the case of *Industrial Commission of Ohio v. Gintert* (190 N. E. 400). There was evidence in the case that the teachers were required to prepare their school work, in addition to the hours of duty actually required in the school room. At the time of her fatal injury the teacher had some papers of the pupils in her possession that she had taken to her home for correction and grading.

In this case the industrial commission denied compensation but the court of common pleas of Trumbull County granted an award of compensation that was later affirmed by the court of appeals. The State supreme court, however, denied recovery and held that the application of theory that the teacher was performing work when injured would make the workmen's compensation fund a general insurance

fund. and the teacher would then be eligible for compensation for a fall even in her own home.

Other cases which may be deserving of mention include—

1. The death of a minor killed in an explosion from gunpowder while employed in a plant manufacturing fireworks in violation of the child-labor law and with the father's consent, was held not compensable under the Pennsylvania workmen's compensation law which became effective after injury occurred. This was the decision in the case of *Salamone v. Pennsylvania Fire Works Display Co. et al.* (169 Atl. 450), rendered by the Superior Court of Pennsylvania.

2. The Supreme Court of Minnesota has held that a man of advanced years is as much within the protection of workmen's compensation as a young person. The court pointed out that age is but a factor to be considered by the administrative agency in determining any award as to whether the accident was the proximate cause of the injury.

3. The Utah supreme court considered a ranch carpenter an "agriculture laborer" within the meaning of the State workmen's compensation law (*Anderson v. Last Chance Ranch* (228 Pac. 184)).

4. In a proceeding before the Illinois Supreme Court (*Burns v. Industrial Commission*, 191 N. E. 225), in the death of an employee engaged in resilvering mirrors, based on an alleged injury through the inhalation of fumes from nitric acid and muriatic acid, it was held that there was insufficient evidence to support the findings of a causal connection between the fumes and the acute dilation of the heart causing death.

5. In the case of *Gale v. Trustee in Bankruptcy of the Estate of Atlas Smelting, Mining & Refining Corporation*, the United States Circuit Court of Appeals (California) reversed the previous decision disallowing the claim, and thereby approved the amendment to the United States Bankruptcy Act. At the time of the first enactment of the Bankruptcy Act, workmen's compensation was unknown in the United States. It was hence possible for employers to avoid paying compensation claims by going through bankruptcy. Congress, by the act of June 7, 1934, has now provided for allowance of compensation claims giving a retroactive effect and allowance of certain priority. As a result, any compensation claimant may, through proper procedure, have his compensation claim allowed by a trustee in bankruptcy.

Before concluding this report of workmen's compensation progress in 1934, brief mention should be made of the National Conference for Labor Legislation called by the Honorable Secretary of Labor in Washington, D. C., February 14 and 15, 1934. Of special interest to this group is the report of the committee on workmen's compensation. Approximately 15 recommendations, which the committee considered of prime importance to any model workmen's compensation, were adopted.

The proceedings of the national conference were printed by the United States Bureau of Labor Statistics as its Bulletin No. 583.

Chairman SUPPGER. The next paper is entitled, "Shall the Employee Have a Right to Select His Own Physician?" to be delivered by Dr. James J. Donohue, of the Board of Compensation Commissioners of the State of Connecticut.

Shall the Employee Have the Right to Select His Own Physician?

BY JAMES J. DONOHUE, M.D., F.A.C.S., *Workmen's Compensation Commissioner, State of Connecticut*

Before I begin a discussion of this question, may I say first of all that I believe I have had an opportunity to consider and study the problem from various angles. I have been a compensation commissioner in Connecticut for over 15 years. I have been a practicing physician and surgeon, and in years past I suppose I have had as many families on my list as any so-called "family physician."

As I see it, those vitally interested are: First, and foremost, the general public, which pays the bills; secondly, the injured workman; then the employer and insurer, with interests not materially different; then the physician and surgeon; and last, but not least, the industrial accident commissioner who has no personal interests at stake, but would like to see the workman properly taken care of, with compensation costs kept at a minimum, and things running smooth generally.

The general public has probably the greatest interest in the question for, in the last analysis, the bills are paid by "John Public" and we cannot foster any system which will add materially to his burdens. I believe that anything which smacks of a dole system or adds unnecessary expense to the cost of operation of the various compensation acts, through unwarranted medical charges or unscrupulous encouragement of claims of litigants, must not be allowed to develop.

I know of but two States in the Union today which subscribe to the plan of selection of a physician by the employee, and it impresses me that that is a very strong argument against it. In those States where the selection is made by the employer it is interesting to note that it is not the workman who is disgruntled but those doctors who feel that they are not getting what they may consider to be "their share" of compensation work and that a change in the existing legislation will bring them the desired business. Consequently, the present agitation of the question of free choice by medical associations all over the country is directed not so much toward improving the type of treatment given as it is toward increasing the income of some of its members, and I say this without prejudice to my brothers in the medical profession.

As I understand it, the States which permit free choice of physician by the employee provide a limited medical service. But in a State like Connecticut, where the law provides unlimited medical, surgical, and hospital treatment, it would be quite a different proposition and a dangerous one to subscribe to the same plan. It seems to me that in our State, for instance, it is only just that the employer or his insurer should have the directory power over the unlimited medical treatment—I have known of one single case where the bills mounted to over \$20,000—for which he must foot the bills. He will be interested not only in keeping those expenses within reasonable limits but at the same time also in obtaining the best physical results for the employee. No intelligent employer, nor any intelligently

managed claim department of any insurance company, today is interested in any but the best surgery, and he is not going to quarrel about the bills if the end result is what it ought to be and he is getting real value for his money. As an economic proposition it is generally conceded that it is to his advantage to choose the very best that can be obtained, so that there may be not only an early return to work, but the minimum amount of permanent disability. And in this connection, you cannot blame employers for sending their compensation work to those physicians and surgeons who have proven their ability and integrity, and for not wanting to experiment with Tom, Dick, and Harry, who are unknown to them, and who may indulge in needlessly extensive treatment and endless calls, with a view to what they are going to get out of it rather than to the welfare of the patient.

The average employee, I believe, is not in a position to know where to find the proper medical care for the type of injury which he has. He will very likely go to the nearest doctor, who may happen to be his family physician and who has only an occasional surgical case, and while there is much to be said for the good old family physician, I look with skepticism upon his entrance into the industrial-accident picture.

The argument is advanced that the employee will do better in the hands of his own doctor. That may be true to a certain limited extent, but we must remember that the greater portion of all compensation cases demands surgical care rather than medical, and there are not many doctors engaged in general practice who are capable of handling the general run of industrial accidents. Industrial surgery is as distinct a specialty as gynecology, obstetrics, orthopedics, brain surgery, or any other specialized line. This is so definitely agreed upon that many of the medical schools are advocating courses in traumatic surgery so that their students who go out into practice may be qualified to meet its demands.

What average practitioner is capable of treating the complicated fractures, head injuries, and other surgical conditions arising from industrial accidents? It is hardly possible for him to follow the great changes going on all the time in the principles of treating fractures alone. New methods are progressing with lightning rapidity. The advances in balanced-traction suspension have moved forward with rapid strides. The method of treating head injuries has become revolutionized. The average practitioner knows almost nothing about these things which are in continuous demand and use in the treatment of compensation cases.

On the whole, the type of injury which can be safely assigned to the average family doctor, who is not a surgeon, is the bruises, the bumps, the cuts, and the sprains which in precompensation days were often taken care of by the members of the family without going to the expense of having a doctor, and which can now in many instances be handled by the factory nurse very satisfactorily.

I am afraid that a great and unfortunate trouble with the family doctor who gets an occasional compensation case is that he is often thinking more of the size of his bill than he is of the quick recovery of the patient; he is prone to make a racket out of backs and sacroiliacs and physiotherapy; he is unduly sympathetic. Early

return to light work is necessary to regain full function of an injured member, and this cannot be accomplished when a doctor is carrying the patient along solely for the purpose of treating him over a long period. Regaining of function is largely up to the patient, and it cannot be rubbed or baked or sparked into him if he is dormant and not cooperative. It is the doctor's business to assist, not by sympathy or coddling, but by manful support. We are all willing to take a vacation with pay, even on much less than we would get by working. It is a natural tendency. We need prodding to get the best that is in us; otherwise the vast majority of us would be sitting down and taking it easy. Sympathy is not of much use in surgery.

On the witness stand the family doctor is at a distinct disadvantage. It is not only distasteful to him but practically impossible for the physician who has treated the litigant or his family over a long period of years to testify against him, and frequently he will testify to an impossible theory rather than offend his patient or stand a chance of losing his patronage.

I have been told by an employer of labor that it was his personal experience that free choice of physician is of no especial benefit either to the employee or to the employer. Generally speaking, in the better grade of industry, the employee, regardless of how menial his employment may be, is furnished medical services that a millionaire would obtain, and the average person of ordinary means who pays for his own medical service has poorer medical attendance than the injured employee in one of the high-grade factories; while the medical attention selected by the employee very often does not rise much above that which can be obtained from the ordinary district nurse.

Of course, there are employers who select their factory physicians purely on the grounds of friendship, family relationship, or even nationality, but from my practical observation as a commissioner I would say that they are the exception rather than the rule, because money talks and friendship doesn't go far in business when it has a tendency to put the employer of such friendship into the red. However, to safeguard the employee against such a situation, I believe it would be well for the industrial accident commission to have some power of supervision over the panels of physicians used by employers, so that they may be compelled to have them large enough to allow the workman a choice. Likewise, if the idea of selection of physician by the injured employee is to prevail, I believe that the industrial accident commission should have the same power of supervision, so that his choice may be limited to men qualified to handle industrial-accident cases.

In most communities it is safe to say that probably 30 to 50 percent of the doctors are doing the bulk of compensation work. They are satisfied with the present situation of right of selection by the employer. There is another 25 percent who are indifferent and care nothing about it. In fact, they prefer not to touch it; they do not like the inconvenience of going before the commissioner to testify and of making out reports and forms, which seems to them an imposition. This estimated percentage may even be a little low. Then there is the other 25 percent which seems to be the noisy minority

making the complaint, the element agitating this question of free choice, a good many of whom are not in a position to handle the general run of compensation work as it comes in anyway. They can handle the minor injuries but they are not in a position to take care of the major type of work which is bound to come and requires real surgical skill.

Forgetting the purely personal and selfish interests of any particular class, is it for the general betterment of the entire situation to allow the employee the right of selection of his own physician? I do not think so. I think that such a plan would not improve matters at all but would create a situation, especially in those States where there is unlimited medical service, which might easily get out of hand, with increased compensation costs and a real danger to the workman who may without restriction make a haphazard and unwise choice because he does not know any better.

It strikes me that before we should be ready to subscribe in toto to a program of selection by the employee, there would have to be some very drastic and radical changes along certain lines by the medical profession. Unfortunately, there are doctors who pad their bills, overtreat patients, hospitalize them for needlessly long periods, and indulge in physiotherapy long beyond the time when it can produce any beneficial results, and often to the point where it tends to create neurotics. Those are, in good measure, the doctors who are not getting the compensation business they seek and these are the practices which bring up compensation costs and bring unfavorable criticism on the medical profession. They are the cause of employers and insurers haggling over bills.

A recent survey by an employers' group shows that there was approximately \$40,000,000 spent annually for medical services, \$34,000,000 of it going to the medical men and the rest to the hospitals, and these expenses seem to be going continually upward.

I believe that the only way our present system can be safely liberalized with any thought for economical administration is to provide larger panels of men of ability and integrity, who have prepared themselves to handle industrial injuries, so that there may be a greater distribution of the work amongst the medical profession and still have the work properly done.

The employer, of course, does not want to have too great a spread in the number of doctors with whom he has to do business because it would be more difficult for him to follow the progress of his injured employees and to get from the doctors the necessary reports. With too many in the field there would be a tendency toward less efficiency in the conduct of the compensation system, and because the general public pays the bills but looks to the employer and his insurer for efficient management, if efficiency is lacking and costs go up it is the public from whom the complaint will come.

[Meeting adjourned.]

WEDNESDAY, SEPTEMBER 26—MORNING SESSION
(MASSACHUSETTS GENERAL HOSPITAL)

Chairman, HENRY C. MARBLE, M. D., Surgeon Massachusetts General Hospital

[Dr. Marble gave a brief history of the hospital and then presented his paper on Treatment and Prognosis of Burns.]

Treatment and Prognosis of Burns

By HENRY C. MARBLE, M. D., Surgeon Massachusetts General Hospital

Causes.—A burn is the result of exposure to extremes of temperature. There are six causes of burns. First, heat—fire, hot iron, or scalds; second, cold—from freezing—dry ice; third, electrical—live wires; fourth, chemical—acids, alkalies; fifth, friction—ropes and belts; sixth, light ray—ultra violet, sunshine, X-ray.

The degree and destruction depend upon the temperature of the causative agent plus the amount of exposure. Burns are divided for classification as follows: First degree, a reddening of the skin; second degree, destruction of the superficial layer of skin with blebs and blisters, possibly with penetration into the true skin; third degree, all of the skin destroyed down to the fat. There may be all three degrees present in the same burn. It is usually believed that a third-degree burn of one-third of the body surface will cause death.

It is often difficult to determine the exact extent and degree of a burn. In my experience scalds from hot water are usually not as severe as they first appear to be while electrical burns, on the contrary, often develop much more serious destruction of the skin than appears on early examination.

Symptoms.—First, there is the shock which immediately follows the burn. This must be treated with appropriate measures, heat protection, and morphine. Next comes changes in the blood. Immediately following a major burn there is a considerable loss of fluids from the burned area. The blood becomes more concentrated as a result of this loss of fluid. This must be treated by the substitution of fluid—generally glucose or salt solution into the veins. The third symptom is infection which begins about the 12th hour and reaches its peak in about 3 days, with all the symptoms of sepsis, toxemia, and high fever. (See treatment later.) Finally, there is loss of tissue, or ulceration. (Treatment given later.)

Treatment.—The problem of treatment during the first 3 days is to keep the patient alive by combatting the shock, replacing the lost fluid, and preventing as far as possible the invasion of infection. In severe burns this always requires hospital treatment.

The clothes having been removed with as little trauma as possible, one of two methods of treatment may be followed.

One is called the paraffin-wax method. A paraffin of maximum ductility having a low melting point should be used. Certain preparations include resin combinations and balsams. This paraffin wax mixture should be applied with an atomizer, if available, or a camel's-hair brush. It can be heated to 140° in an ordinary double boiler. This should be applied to the freshly burned surface which has been dried as much as possible. In my hands the atomizer is very useful, but I have often used a small spray, which is easily obtained. A very thin layer of cotton is then laid over the paraffin and a second layer of wax applied with a camel's-hair brush. A second layer of cotton and a third layer of wax are useful. The wax dries immediately. The dressing is then reenforced with a large absorbent-cotton dressing and bandages. This dressing, removed in 24 hours with bandage scissors, falls off without pain. The entire burned area is then dried with an electric dryer or by sopping it with sterile-gauze pads. The surrounding unburned area is cleaned with ether and protected with zinc-oxide ointment. The wax is then reapplied with an atomizer or brush reenforced with cotton. Secretions and slough fall off with each change of dressing and are generally painless. Granulation tissue appears rapidly and when the entire necrotic area has separated the tissue may be sterilized by the Carrel-Dakin method.

The other method is with tannic acid. When the patient is admitted to the hospital, if the burns are severe, the patient is immersed in a bathtub of tannic acid, 5 percent (105° F.). This is based upon the theory that tannic acid tans the dead skin and renders it less toxic. The patient is left in this bath until the entire burned area is thoroughly brown. This requires from 2 to 6 hours. The patient is then put to bed in a warm room, and the shock and infection, as before discussed, treated, until the entire crust separates. If small areas are found that are not adequately tanned, wet dressings of 2 percent tannic acid may be applied.

For both of these methods of treatment careful nursing and hospitalization are required. I personally prefer the paraffin-wax treatment because it relieves the pain, the dressings are painless or very nearly so, and the separation of dead tissue rapid. I have found that other methods of treatment, because of the pain of the dressings, cause the patient to fear them and this is associated with loss of sleep and loss of appetite.

Under any method, as soon as the area is ready, skin grafting must be done. Thiersch grafts are used which are placed upon the clean granulations and are held in place with a celluloid dressing and a large absorbent pad bandaged with a cotton elastic bandage and no dressing for 4 days. After a week, if there are other open areas, skin grafting should continue. Plastic and reconstructive surgical procedures can be done at a later date.

Prognosis.—The first-degree burns are usually not serious. Second- and third-degree burns are dangerous. The prognosis depends upon the extent and degree of the burn. It also depends upon one's ability to combat the shock and loss of fluids. Patients often do badly with relatively small burns because this is not anticipated and are in poor condition to combat the infection which so frequently follows.

Burns often result in deep, deforming, contracting scars. This can be minimized by early skin grafting and appropriate plastic operations.

[Dr. Marble demonstrated the treatment of third-degree burns by the paraffin-wax method by presenting two of his patients who had had extensive third-degree burns and describing in detail the treatment given them as follows:]

I will discuss the paraffin-wax method because I am a partisan of that method of treatment, and I have asked Dr. Richard Wallace to come and show you a case of his of the tannic-acid method. Dr. Wallace has been specially assigned to this hospital to make a study of that method, and he is doing that now.

The paraffin-wax method of treatment was brought out during the war by a French physician who had to treat these terrific burns in the war, and who devised this method of treatment with paraffin wax. It had a tremendous vogue and was very successful. The tannic-acid method was devised by Dr. Davidson in Detroit, within the last decade. That also has had a tremendous vogue, and is also very successful. So you see that we have before us something fairly recent.

But I was interested, as I looked up the original articles describing these new methods of treatment—the utilization of paraffin wax and balsams of various kinds to make a covering for the burn—to find out that Hippocrates some time before the birth of Christ, at least 2,000 years ago, in his book described the proper method of treating burns. This is what he said: "Put on beeswax and balsam." Now that was 2,000 years ago.

I was further interested in discovering that Chinese physicians at least 5,000 years ago recommended in the treatment of burns that people should sop the burns with boiled tea, which is tannic acid. So you see that the methods which we have rediscovered and which we are giving to you today as new are in fact not new at all. One is at least 5,000 years old and the other was at least in existence at the time of the birth of Christ. So they are not at all new. They are very old, and we are just rehearsing them again and giving them to you in new dress.

Now, will you have Mr. Purdue come in here? [At this point a patient was brought in for Dr. Marble's demonstrations.]

Here is the first young man I want to show you, a young man who looks happy and cheerful. About 2 years ago at Christmas time he received a Christmas present. He was working for the New York, New Haven & Hartford Railroad, and his job was to burn the right of way. He had to put kerosene on the right of way, burn it, and then put it out; and then put on some more kerosene, burn it, and so forth. He kept the right of way clear so that those of us who ride to and from New York might have a pleasant journey. By some misadventure he poured some kerosene on his trousers, just as a mechanic in a garage often does. In this case a fire followed and his trousers became ablaze. His leg was burned from the ankle to the groin; every bit of skin was taken off. He was taken to the hospital, where some strips of boric acid were put on. He went through a terrible ordeal. He became infected. His blood became concentrated. He lost weight, going down to about 100 pounds. He was

just skin and bones. His leg was red, with no skin on it at all from the ankle to the groin. Now the thing that bothered this young man most was not the burn—incidentally his hand here was burned too—but it was the pain. I would go in to see him in the morning and ask him how he was, and he would answer me only by one faint word, "Pain." We cleaned his leg and sprayed on it a coating of ordinary paraffin. You can buy it at the 5- and 10-cent store. It was melted and put on with a simple little atomizer device. This little device cost \$8 and it sprayed the paraffin right on the leg. The minute that paraffin sealed the burn his pain stopped.

The only trouble with the \$8 device is that it is rather hard to work, and makes the hands sore. So one of the nurses in the hospital conceived the idea that maybe a less elaborate surgical instrument might work just as well. She went to a store and with 25 cents of her own money she bought a spray gun. She filled that up with paraffin, and while another nurse held Purdue's leg, she sprayed it on, and in four or five shots she had the job done. That is a lesson in the purchasing of surgical materials which might interest you. We buy the paraffin and we use it with the spray gun.

Having covered that leg with a thin, tiny film of paraffin wax, we put on top of that a little fluff of cotton, just the thickness of a piece of tissue paper, and over that we painted with a tiny camel's hair brush another layer of paraffin, then more cotton and more paraffin, all over his leg from groin to ankle. The paraffin was boiled in a 5- and 10-cent store double boiler—you can buy a nice nickel-plated container from a surgical supply company for \$4. Having sealed that leg, his pain was better.

Mr. KINGSTON. How did you clean that wound before you put the wax on?

Dr. MARBLE. We did not clean the burn at all before we put the wax on. Dr. Sherman, in the Carnegie Steel Works, has the paraffin ready in the emergency room, and when a man covered with dirt and grime and grease comes in with a burn he sprays the paraffin on. Dr. Sherman believes that the original burning sterilizes the wound. The second time we clean it carefully, meticulously, with ether. We protect the unburned skin with a little zinc-oxide ointment. We dry the burned area the same as the barber dries your face, with a towel, just putting it on and taking it off, like this [illustrating].

Some people use an electric blower, but that is not necessary at all. We dry the burned area and cover it with paraffin wax. The skin came off here from top to bottom. Then we started to work on him. We grafted skin. Those of you who are near enough can see his entire leg here, made up of grafted skin, every bit of it. We grafted this entire area of skin from here to here [illustrating]. There were four different fittings. We would put on some, then wait a while and put on some more, and wait another while. Finally we covered his entire leg with grafted skin.

When we grafted that skin, we took a knife and cut the skin, sliced it right through there [illustrating on blackboard]. We took one-half the groin layer, right here [illustrating], and put it on his leg here. We took some skin from his other leg and we took some from his abdomen, and we took some off his back, too.

In all, this man was incapacitated about a year. Now, let's see what you can do with that leg. Straighten it out. Bend it up, bend the foot. He is doing his work now. In fact, he got a promotion. He is now an instructor, but he can do his work. He is back on the job. He has a good leg; it is useful, and it bends and does everything that he needs it to do as an inspector of right-of-way on a railroad.

Mr. KINGSTON. Was that skin grafting done by the pin-point method?

Dr. MARBLE. No; it was done by the tierce method. The skin was about 1 inch wide, approximately, by 2 or 3 inches long. We sliced great slices of it off.

I have a little girl here to show you. This little girl was one of those terrible cases of a little girl playing with fire. Her dress caught fire, and the first thing she knew there was a flame coming up all around her. This young lady arrived at the hospital burned and toxic. I showed this young lady at a clinic following her original burn; there were a dozen or 20 doctors present, and the opinion was almost unanimous that this burn would be fatal. We treated her with paraffin wax daily. This dressing had to be redone every day, cleaned up and redone, until she had actually lost everything from her umbilicus, down her groins, to her knees, with the genitalia being entirely burned away.

Now can you see what happened? She was burned from the knee to the groin; all of the skin was taken off her abdomen. She didn't have a bit of skin on the abdomen. She lost weight. She was toxic. We had to give her fluids. We had to combat that terrific infection. Finally, all the skin came off. The pain would have been terrific if we had used meshes. Think of going through that daily with this girl. But the paraffin wax reduced the pain almost to a minimum, and as soon as it was cleaned up we began grafting new skin.

We had to build a whole new abdomen, a whole new front of the leg here. The genitalia were all burned away, and they had to be grafted. In the following process, however, as so often happens in these cases of burns, she has these contractions. You can see them right in the bend of the groin here; you can see how the skin has overgrown. We will have her stand up now and you can see what I mean. You see she has these contractions of the skin across the fold of the groin. Now that had to be removed, and new skin had to be put into its place. Scars from burns contract. Most scars stretch, but burn scars contract, because of just what you see there.

Dr. Wallace will now show you his method. Dr. Davidson, about 10 or 12 years ago, described the method of tanning the skin. Dr. Wallace is going to show you a case in which that method has been used. This method has been illustrated at the Century of Progress. At first, our results were not particularly happy, but Dr. Wallace has been working and working hard with it, and he has finally devised a method which we believe may solve the problem of the tannic-acid method.

Dr. WALLACE. We have been using tannic acid at the Massachusetts General Hospital since about 1926, but we have been using the present method for less than 2 years. The modification of the

method that we are now using we are convinced is much better than the old method—not only the method of Dr. Davidson of putting on the packs of tannic acid, but also the spraying method, or other modifications which we think are inadequate.

Now this idea is not mine. It is the idea of Dr. Donald Wells, of Hartford, Conn. The chief difference is that when we get a patient who is burned, we put him into a tub of warm 5-percent tannic acid immediately. The great difficulties with burns are: first, pain and shock; second, the loss of fluid; and third, the subsequent infection. Just as soon as this patient is placed in the tub of warm of tannic acid, around 100 or 105 degrees, there is immediate relief from pain, and he no longer has pain until the slough begins to separate.

As soon as the patient is in the tub the area is sealed over and he no longer loses any fluid, so that if we get the patient before he has lost enough fluid to upset his balance, we have no difficulty with blood chemistry from secondary nephritis, or any other complication that we used to get. The interesting thing is that once we get our tan and keep it dry, which is just as important as getting a complete tan—if we have all of the burned areas tanned, including the secondary areas that come on for 2 or 3 days, and keep the tan dry—we never get an infection at all. We have had no infection in our burns when we have been able to carry out this treatment. I have one case which I think will illustrate that. There are no daily dressings, and the patients are perfectly comfortable right from the beginning. Of course, it is necessary to get them within 24 hours, and the sooner the better.

We are able to get the tan up to 18 to 24 hours, but if patients go that long and are severely burned, their blood chemistry is upset, and we are unable to straighten them out for some time. Some 9 weeks ago this lady, with a can of kerosene in her hand, tripped and fell in her kitchen. There was an open gas fire there, and the kerosene spilled all over everything and started the fire, and she was burned over about 35 percent of her body area, as you can see [illustrating].

Dr. MARBLE. May I interrupt to add just one word to what Dr. Wallace has said. The principle here is that you tan the skin, just as you tan any other skin. In other words, you convert it to a piece of leather, literally.

Dr. WALLACE. The fortunate thing about this lady was that she had been in this hospital about 3 years ago with pernicious anemia. She was cured of her trouble, and had been well of that ever since, on a liver diet, and she thought that this was a pretty good place. So when she was burned and they started to call a doctor in the nearby town where she lived, she said, "No; get me an ambulance and take me to the Massachusetts General Hospital." We had her in a tub of tannic acid within 1 hour, and because of her early treatment her chemical balance was never upset at all. I mean her blood chemistry has never been abnormal. Her white count, of course, was up, as it is almost immediately. She had 27,000 white count when she came in. Her hemoglobin was only 80. Her N. T. N. has been normal, and her blood chemistry has been normal right from

the beginning. She had no concentrated blood. [A couple of pictures taken the second day after her admission to the hospital were passed around.]

These are the recorded temperatures: The highest, for just 1 day, is 101. She has been here 9 weeks now, and on subsequent charts you can see that the temperature line is entirely flat, which is a fine index of what has happened. She has had virtually no infection in 9 weeks.

Dr. MARBLE. Was that arm a third-degree burn?

Dr. WALLACE. Oh, yes; there was no skin on that at all. None on the arm at all.

Dr. MARBLE. That was all grafted on there?

Dr. WALLACE. Yes; I have grafted the whole thing on there. She was burned all along the right side and her neck and her shoulder and her chest. That was a third-degree burn, way into the fat. I mean you could see the vessels in the fat when the eschar finally came off. The eschar comes off in about 4 or 5 weeks, leaving a clean granulating surfacing. Late in the fifth week I grafted the whole chest and all the arm, and that is all practically healed now. There are areas here, as you see, that I have not grafted as yet. She is very apprehensive and decided that she did not want any more grafting, and as these areas are located in places where the contracting is not going to be of any more consequence, I did not insist that it be done.

Dr. MARBLE. Dr. Wallace is now showing you the method that is used here. This woman, who not only was badly burned but also had pernicious anemia, was put into a tub of 5 percent tannic acid, and very shortly the skin was tanned thoroughly and completely. None of the terrible things which I told about, the concentration of blood, the losing of fluid, and a terrible infection, have happened. He had her soon enough, and she has gone along splendidly.

Dr. WALLACE. I just want to say that the tub is the one great improvement of this treatment. This hot-air blower is absolutely essential for the success of the treatment. It is merely a commercial hair blower. There are a great many types on the market that are used in beauty parlors. The blower runs on regular current, and there are 3 degrees of strength of air and 3 degrees of heat. As soon as we take the patient out of the tub we put on the air blast and dry all the burned surfaces. We leave the patient in the tub as long as 2 hours, until the burned surfaces are entirely cleaned and debrided. We are very careful to clean and dry and debride, and as soon as we have dried the area where we have the tan we are all through with it. Then we keep the blower going the first 2 days, and then for about 10 minutes every hour after that, which is enough to keep the tan dry. As long as we keep the tan dry, we have no infection at all.

Dr. MARBLE. I am very glad that you have seen that case, because at least once a week Dr. Wallace and I have a violent discussion as to the particular merits of each method. I am reluctantly beginning to believe that there is something to the tannic-acid idea. I believe this is the most striking case I have ever seen. She was burned something over 38 percent of her body area.

Now, Mr. Purdue, you just walk out here and show these people how you get along with a year-old burned-off leg. You see, he is all right. He can move around quite easily, and he can resume his work and become an economic unit in society. Mr. Purdue took half a day off from his work just to come over here and show us his ease.

For a long time Dr. Joseph Aub has been interested in poisonings by heavy metals, and, as you may all know, he has written a monograph on the subject of lead poisoning. Dr. Aub has come here today to talk to us about his work on lead poisoning.

Industrial Poisonings

By JOSEPH AUB, M. D., *Associate Professor of Medicine, Harvard Medical School, and Physician in Chief, Collis P. Huntington Memorial Hospital*

When I was asked to speak about lead poisoning, it seemed to me that the principal elements we are confronted with are ordinarily two: First, the diagnosis of lead poisoning, which in my experience in industrial accident boards, is extraordinarily difficult; and, second, the problem of what are the chronic effects, the so-called incapacitating effects, which last for the lifetime of those individuals who suffer from lead poisoning.

I thought I would take up those two subjects today in the few minutes which I have and try to express my opinions about them. First of all, the difficulty of diagnosis of lead poisoning in industrial accident boards arises largely because the diagnosis has to be made so late. It is exactly like asking a doctor to come and see a case of measles after the rash has gone. The way to make a diagnosis of lead poisoning is by objective signs, and the greatest difficulty that I see that you are confronted with is a differential diagnosis between a person who really has lead poisoning and a person who has seen a case of lead poisoning and therefore mimics it in order to get the compensation. Those cases are very common. After all, there are two characteristic things about lead poisoning: First, subjective symptoms; and, second, objective signs. Now, anyone can say that he is constipated. Anyone can say that he has colic, and you cannot deny it. After all, anyone can say that he has a stomach ache, and there is nothing objective about it. A doctor cannot say that a man has a stomach ache or has not a stomach ache. The patient is the only one who really can tell that fact. Therefore, in order to make a clear-cut diagnosis of lead poisoning, one has to have an objective sign, something that he can see, and there are a great many such objective signs in lead poisoning if you see them early. The difficulty lies in the fact that so many of these cases come to you 6 months after their exposure, or after they have stopped work for 2 years, and then you are expected to decide whether or not they have lead poisoning.

That is the problem primarily which occurs in every industrial accident board, and occurs to everyone who sees a case late. For instance, take any doctor who sees a case late and who is expected to arrive at an opinion. When one sees the case late, and there are no more objective signs, the only thing one can do is to see whether the case sounds like a typical case of lead poisoning.

What are the objective signs of lead poisoning? Those are the things in which we are most interested, and about which I want to say one or two words. First of all, the lead line. The lead line is a perfectly typical picture which comes in practically everyone who has been exposed to lead and has absorbed lead for some time. It does not prove lead poisoning. It is merely an indication that the individual has absorbed a good deal of lead. The lead line comes in the mouth mostly, between the teeth, and consists of small dots of lead deposited in these areas of the skin. It consists of lead sulphide, due to the fact that with pus around the teeth hydrogen sulphide is formed, and as the lead circulates around in the body it is deposited as lead sulphide. Therefore, it is a black area which is a punctulate area, these being the teeth [pointing to diagram] and this being the gum [pointing]. It comes chiefly in these little areas here as little black dots, and it comes from pyorrhea, which most of these individuals have. That lead line, if it is a big one, may last 6 months. If the individual takes good care of his teeth, it disappears in short order.

The second objective sign that appears to show that a person has absorbed lead is in the excreta. That is being used a great deal now in the diagnosis of industrial accident boards, and it deserves a few words here. First of all, we are all of us exposed to lead, and I may say right here that in that monograph which we wrote there is one subject on which I think we were distinctly wrong. We said that normal individuals who were not exposed to lead industrially did not excrete lead, but the consensus of opinion throughout the world now is that nearly everyone excretes lead in their urine, for the simple reason that there is so much lead around us—arsenate of lead on our food, lead dust from rubber tires, etc. We all absorb small quantities of lead, and therefore there is in the excreta of most of us—not in everyone, but in most of us—a small quantity of lead, which can be found with the refined methods which are now used for the determination of the presence of lead. The usual standard which people all over the world are now using is one-tenth of a milligram—that is an extraordinarily small quantity—per quart of urine. That is considered normal, and anything above that amount is considered abnormal in amount, implying that that individual was exposed to too much lead. Now that is a very small quantity, but it at once rules out a test for lead in the excreta being of any diagnosis value in lead poisoning. That is very unfortunate because it was a good quantitative test, a good test which ought to tell whether a person was exposed to lead or not; but the mere fact that so many normal people are excreting lead makes it necessary now to have a quantitative determination showing more than one-tenth of a milligram to a quart of urine to show that an individual has absorbed more lead than is normally true.

In order to make a diagnosis of lead poisoning, one has to distinguish between lead absorption and lead poisoning. A great many people absorb lead in industry. There are 150 industries that have lead hazards of different types. An enormous number of people are exposed to lead, taking in fair quantities of it, and yet never show any disease from that absorption. That is lead absorption. They do not get any results from it, as far as we know. Then one comes to lead intoxication; lead intoxication means that the tissues

of the body have been injured by exposure to that metal. Now what happens when tissues are injured? Well, lead hits tissues primarily. It hits primarily the blood, and it also hits the nerve muscles, the muscles of the body—those are the tissues which lead has a predilection for and injures. It is very easy to tell by a simple examination of the blood whether or not the blood has been injured. First of all, you get anemia, and, second, you get a striking effect on the red blood vessels called stippling. A red blood cell, if I may show it to you diagrammatically, is nothing but a sac of hemoglobin, but when one has lead poisoning, all through some of those red cells there are little black dots which look like lead dots. They are not, so far as we know, lead, but they are quite obviously different from normal cells. That also requires a certain amount of judgment, because one does find a few of those cells in normal individuals, but when one finds a great many of those cells in an individual who has not the severe anemia which occasionally some of them have, that is very good evidence indeed that the individual has absorbed more lead than is good for him and is suffering from it. Therefore, a secondary anemia, plus a good deal of stippling, is excellent evidence that an individual complaining of stomach ache and the like has lead poisoning.

How long does that sign last? That sign lasts maybe 2 months or so after the individual has stopped work, and it gradually disappears from the blood as the individual gets better. The high lead excretion, by the way, lasts a fairly long time. It may last over a year after the individual has left work, and therefore if you do get a high concentration of lead in the excreta, one may find that as long as a year after the individual has left work.

There are other objective signs, of course. The pallor of the lead poisoning is obvious. One can get X-ray findings in colic, showing the spasm which is producing the colic, and occasionally that is found, and is an excellent objective sign. Last of all, one gets the neurological sign, the wrist drop, and palsy, which lasts for many months or sometimes lasts forever. I will show you photographs of some of those to show you how characteristic they are.

Now we will have that first slide. Here is a man who was in lead work who has this characteristic wrist drop. It is extraordinarily specific. It hits the extensor muscles of the wrists mostly. That man can move everything, but he could not raise his hand like that [illustrating]. The extensor muscles were injured. That made it impossible for him to lift his hand like that [illustrating]. If he puts his hand into a position where it is there [illustrating], you see the hand drops down, and if he buttons his coat it would be like that [illustrating]. There is this characteristic drop of the hand, and you can see that very late after he is getting much better. It is agony for him to button his coat, and instead of buttoning it like that, he buttons it like this [illustrating], because the extensor muscles are weak.

One can also get motor muscles involved. This man I am going to show you is a painter who had his whole arm involved and also his shoulder, but the flexor muscles of his hand were all right. The only thing he enjoyed doing was smoking a pipe, and he could hold onto a pipe because the flexor muscles were all right, so we put

his hand down here [illustrating], and we fixed up a long pipe for him, and by doing this [illustrating] and moving his hand just like this [illustrating], he could smoke his pipe, which he did all day long. Then he gradually improved, until after 6 months he could raise his arms that much [illustrating]. He later became quite well in spite of the fact that he was 70 years old. The reason why he improved so markedly was because the palsy had just come and had not lasted a long time, and with careful treatment, in getting rid of that, of course he improved, but the wrist drop never got completely well. He was quite an old man, of course. These lead palsies will last at least 6 months before improvement is marked, and gradual improvement occurs over 2 years. At present lead poisoning is so much better taken care of than it was 20 years ago, that these very severe lead palsies and lead encephalopathies, which are the most characteristic results of lead poisoning, are rare.

So much for these manifestations. How long do they last? A lead colic, if well treated, ought to disappear after 24 hours, and an individual ought to be incapacitated for 5 or 6 weeks or, if it is a very severe one, 2 or 3 months. A wrist drop, such as I have shown here, practically never, if it is complete, gets well inside of 6 months. If it is only a wrist weakness, which comes for weeks before the wrist drop comes, those individuals can get well within 2 months, but if you have a real paralysis from lead, it usually takes 6 months, and after 2 years you can assume that the individual is not going to improve very much more, and what residue remains usually remains for life.

The third characteristic is encephalopathy, a lead insanity. It is very rare nowadays, but it is of very grave import, because a case of real encephalopathy is very apt to die, and those who do get well are apt to have a residual which lasts for months. Some of them recover from it entirely, but others have residues which last the rest of their lives. But they are very rare these days.

Why do these various characteristics disappear? Well, the reason is this. Lead is a very poisonous metal, but the body has a marvelous mechanism for taking care of it, and what it does is to take this lead as fast as it comes into the body and store it in the bones. In the bones this lead does no damage. After a few months, when a person has a good deal of lead in the bones, this lead is transported by being excreted. After 6 months or a year the lead excretion in these individuals is approximately the same as in normal individuals, but there is still lead in their bones, only it comes out in such little quantities that it does not damage the tissues as it comes out. So much for these manifestations.

The second thing I want to talk to you about is this. There are some things that come up in industrial accident boards—they have come up in my experience quite often—about which no one seems to know very much, and I thought I would tell you what is known about them so that you can judge of their importance. They consist of three: First of all, the chronic nephritis which is attributed to lead; second, arteriosclerosis as it is produced by lead; and third, the chronic neurological problems which are sometimes attributed to lead. This is a difficult thing to talk about, because we do not know very much about any of them, but I thought I would tell you

what is known about them so that you can judge these cases in a wiser manner when they do come up, because they are always coming up in industrial accident boards. Let us take up the subject that we know more about, which is chronic nephritis—chronic Bright's disease—which is attributed to lead poisoning. As you all know, when a lead case comes in the doctor will say that the person has Bright's disease and that it must be due to lead, and therefore the person is incapacitated for the rest of his life. How much do we know about Bright's disease as produced by lead?

I have been over all the literature on this subject for information, and I will tell you just what I have learned. First of all, there is Dr. W. B. Bell, who has recently been giving huge quantities of lead to individuals who had cancer in order to try to treat the cancer. The method has been superseded and is no longer used, but he injected intravenously such enormous quantities of lead that the person got very severe lead poisoning. He gave doses large enough almost to kill some people, who were very susceptible. Some of the patients showed improvement, but on the whole the lead poisoning which is produced is so severe that the method is of no value. Some of those individuals did show abnormality in their kidneys; they showed albumin in the urine and they showed edema. Therefore, lead can produce damage to the kidneys, but remember those were overwhelming doses of lead.

The second good evidence in the literature is by a man by the name of Dr. Nye, who has been interested in lead poisoning in children in Queensland. Queensland is an interesting place. They use lead paint on the houses. The atmosphere is such that the lead paint flakes off very markedly, and children are exposed to lead in considerable amounts when they lick the paint on banisters and railings of their houses, etc. A good many of them have been found to have gotten lead poisoning, and severe lead poisoning, because children do get very severe lead poisoning. Dr. Nye, in following those cases which he knew had lead poisoning, found a very high incidence of chronic nephritis in these children within 8 years thereafter. That is very good evidence, to my way of thinking, that lead will produce nephritis in individuals. Badham and Taylor, who also worked in Australia, have also said that they find some evidence in their severe lead poisoning cases of Bright's disease. However, in my experience with a good many lead poisonings, although I have never thought that the cases we see are anything but relatively mild, and nowhere near so severe as the cases that Dr. Nye and Dr. Bell worked on, practically none of the cases that I see of industrial lead poisoning show evidence of nephritis greater than one would expect in individuals of their age. Remember that nephritis is a very common disease, caused by all kinds of conditions, many of which we know nothing about, and as one goes on in life one is very prone to disease. In my experience with younger people who have lead poisoning, the mild types such as we see around here, I do not see any evidence of nephritis or kidney irritation from lead. This is the same experience that Legge had, as in his recent book, *Clinical Toxicology*, he says that in cases of lead poisoning he practically never sees any nephritis. Lead can cause nephritis; you cannot get away from that. That lead does cause nephritis is, I think, in most cases extremely rare. In most cases there is no evidence.

Now about arteriosclerosis. Arteriosclerosis among lead workers has been reported in the textbooks from away back. Yet when one looks over statistics of the incidence of arteriosclerosis in lead workers, indicating high incidence of it, the statistics are extraordinarily meager and mean very little to me. There is nothing good in the literature of experimental work which implies that lead produces arteriosclerosis. There are two smaller works in which lead was produced through blood cells for a period of 3 months and where it produced a spasm of blood vessels, just as it produces a spasm of the intestines. The evidence of arteriosclerosis being produced by lead is extraordinarily meager and, as we all know, everyone has arteriosclerosis when one grows old, and to attribute the arteriosclerosis to lead, with mild exposure to lead, seems to me to be fairly far-fetched.

Now we come to a very much more difficult problem, and that is the queer neurological signs which one sometimes finds in chronic lead poisoning, and which last a long time after the lead poisoning is over. There are two of these types. The most common is a nervousness and worrisome neurotic tendency which these individuals have, and which is very difficult to size up. If they are well treated, individuals with lead poisoning do not get these queer, obscure signs of not feeling very well, and being nervous, and worrying and saying that they are unable to work because they have a chronic disease. They are of two types, as I say. One certainly is a compensation neurosis, and when one of these individuals is given a lump sum—no matter what the size is, I do not care about that—and the case is closed, so that he knows there are no more checks coming in each week to tell him that he is still sick and that he is still incapacitated, this compensation neurosis is enormously improved. To keep on giving him some money every week merely keeps on telling him every week that he has a disease from which he is not yet well, and therefore continues his compensation neurosis. The cases of this which are most striking are the cases from the United States Government, which are perfectly extraordinary when you see them. They have been sent to me from the several boards of the country. They come in with the most obvious compensation neurosis that is possible, and they are completely incapacitated; but it is not due to lead in those cases. It certainly is due to their compensation.

Then there is a second type of neurological condition, of abnormal condition, which is very difficult to diagnose, whether it is due to lead or not. As you know, the literature of pretty nearly every neurological condition has been attributed at one time or another to lead, and now work is going on to show that multiple-sclerosis, which is a very obscure disease, is sometimes attributed to lead. I am frankly unable, as I have looked over the literature, to arrive at a conclusion in regard to that. These cases are very obscure. The possibility of their being due to lead, it seems to me, is very slight. In the cases I have seen that I thought might be due to lead, when I studied their lead excretion, this was so minimal that the condition could not be due to lead, and yet there is the possibility that occasionally a case of multiple-sclerosis, or a condition such as progressive muscular atrophy, may be due to lead.

One case comes to my mind especially. This case looked like progressive muscular atrophy to me. The man gets compensation from the industrial accident board. I thought he ought to have it. At that time I thought he had progressive muscular atrophy. As I stated to the board at that time, the only thing which would tell whether the man was a victim of progressive muscular atrophy was what would happen to him over the next 2 or 3 years. Well, during the following 2 or 3 years that man improved and has not gotten any worse. He has improved a good deal, and I think that shows that that man was suffering from lead poisoning and not from progressive muscular atrophy. Those cases are extraordinarily difficult to decide, and I do not know how you can deny them unless through a very difficult research to see how much lead they excrete in their urine.

If I may summarize what I have tried to say, it is as follows. The difficulty of the industrial accident board in the diagnosis of lead poisoning is that you see your cases too late. You cannot always make a proper diagnosis when the cases come to the board for decision. The only way you can get around that is, when the case is first reported to the board, and there is any question about whether that case has lead poisoning or not, have the man see a competent physician then, one who can really make the diagnosis. Do not let the case drag on for 6 months or a year or so and then ask the doctor whether the patient had lead poisoning, because it just becomes a matter of opinion then, whereas if the case is seen by a competent physician early enough, a diagnosis can be made by the various objective signs which I have stated to you. The other problems which come to you are whether the nephritis, the arteriosclerosis, and the various neurological conditions are due to lead poisoning, which the man obviously has. To sum up, my present opinion is that the nephritis can be caused by lead poisoning, although in my experience it has been extraordinarily rare; that in arteriosclerosis there is practically no evidence to prove that there is more arteriosclerosis in lead workers than in other individuals; that the neurological conditions are of two types—a compensation neurosis, and this other occasional type where a true neurological lesion occurs in the body and nobody knows whether or not it is caused by lead poisoning.

Chairman MARBLE. Dr. William A. Rogers will now discuss fractures of the spine with you.

Fractures of the Spine

By WILLIAM A. ROGERS, M. D., *Instructor in Orthopedic Surgery, Harvard University Medical School*

My remarks this morning are really a report to you of 31 consecutive cases of fracture of the spine—broken back—treated here between 1928 and 1932 by methods which have not within the last 10 years been employed hitherto. The fractured spine, the true broken back, has been a good deal of a problem to the medical profession, and I do not doubt to you gentlemen, largely because of persisting back-ache and easy fatigability on the part of the patient.

[Slide.] The vertebral column is represented here. The squares, or blocks, here and here and here [pointing] represent the body of the

vertebrae. These processes that project off behind are the knuckles which one feels between the muscles and with a bent mass of ligaments between them. In the center of each vertebra is a canal within which lies the spinal cord. There is rather ample spacing provided by nature about the spinal cord to give plenty of room in case of an accident, of a fracture, to the vertebral body. The view here is a view from above. You are looking down on a vertebra. These are the transverse processes here [pointing]. This is the spinous process [pointing], and here again is the top view of the body of the vertebra, the side view of which you see here [pointing], and here is the spinal cord running right along the center of the bony vertebral column.

Here is a fracture of the spine. This is a true broken back. A fractured transverse process will be shown later. That is in no sense, at least from a practical standpoint, a broken back, and must be clearly differentiated in our minds in dealing with this problem. This here is a relatively serious injury. The fractured transverse process is a quite minor injury, as I think I can demonstrate.

In this picture the spinal cord has a kink in it. The ligaments are torn behind. The vertebral body is crushed and the ligaments are folded in front and stretched behind in this fracture.

This next picture shows the third group of broken-back cases, the so-called "fracture dislocation." In addition to having this crushed in the body of the vertebra, the vertebra above has dislocated downward and forward. The spinal cord is at a precarious angle, and it is not uncommon especially in this type [pointing], sometimes in this type [pointing], to find that the spinal cord has been injured by the accident. Where there is a definite injury in the spinal cord, that patient, so far as we are concerned, is practically a permanent total disability. The spinal cord, once injured, never regenerates, and that individual is going through the rest of his life with paralysis. The spinal cord may not be actually injured or crushed; it may be simply stretched or jarred. Early in the course of the treatment we may have paralysis, both motor and sensor, in these cases, but in a period of a few days to 6 months or longer, all that paralysis, if the cord is not definitely damaged, will clear up.

[Slide.] The fourth group is the fracture of the transverse process. That, as I said before, and as I think I will demonstrate this morning, is a minor injury. It has none of the seriousness that goes hand in hand with the three preceding groups. Dr. Donohue asked me to stress the so-called rudimentary rib in these transverse process cases. If you will note on the left the line is very jagged. That is a fracture. Here [pointing] the line is quite smooth. That is a developmental defect and is not due to injury, and it is well to bear in mind that before the industrial accident boards and in the civil-law courts, this is, either through ignorance or willfully, presented as a fracture, a definite evidence of injury. The smooth line there will tell the story. The absence of callus after some months will also tell you. Those are evidences that cannot be refuted. It is very difficult to impress upon people that this is an injury of minor extent.

[Slide.] The methods we have followed since 1928 on our end cases have led to some very interesting end results. As I have said, we treated 31 consecutive cases between 1928 and 1932. We did not pick and choose them. We took them just as they came—31 cases between

1928 and 1932. Those cases were treated by correcting or reducing the fracture, a thing which we had not done here theretofore, and which prior to that time had not been described in the literature. Davis, in Erie, Pa., did it before we did. We did not know it, but he was the first. And at the same time we were doing our work here Dunlop in California was getting the same reductions that Davis and we were getting, but by entirely different methods.

Of the 31 cases, 20, or 65 percent, returned to preinjury activities in an average of 8 months' time. Six more, or 20 percent, returned to lighter activities, but were economically independent; that is, financially independent, but doing less strenuous work, in an average of 8 months' time. In other words, 26 of the 31 cases achieved economic independence in an average of 8 months' time.

We had five failures. Two were well, but could not find work. One was well but would not work. That patient confided that her back was perfectly well, but she could not work because she was suing the railroad for \$25,000. Two were surgical failures. We know why they were failures, and we think in the future we will avoid a repetition of the errors responsible for the failures in those two. They were up and about and active, but not working because of the same complaint which we dealt with before we learned to reduce these fractures, the difficulty being low back strain and easy fatigability on incessant stooping and lifting.

I thought you would be interested in the last four industrial accident cases—these are consecutive cases—during this work. These are not fractures of the transverse processes, but fractures of the body of the vertebra, real broken back. On this chart [pointing] this first case is that of a house painter 39 years old. He was 23 days in the hospital, with a period of 5.7 months' disability. His hospital bill was \$117, and the amount of compensation was \$317. This house painter was a grand fellow. He wanted to get well. We could not get him well too soon to suit him. We let him go back home a little ahead of schedule on his insistence, because we could not control him, and we do not take too much credit for that first case.

Case no. 2 is a roofer, age 28, 92 days in the hospital. He had a sister who was a nurse, and she had the old-fashioned idea that a fracture of the vertebra body was a terrible injury. She would not stand for his going home, and he had to stay in the hospital and have special nursing. His period of disability lasted 7 months. His hospital bill was \$390. He received \$476 in compensation, and then they had to settle with him for \$600.

Case no. 3 is a truckman, 21 years old, likewise a grand youngster, who was only 28 days in the hospital. I did not get him until he had been here a week. It ought to have been 21 days. He had 5 months' disability. His hospital bill was \$141, and he received \$220 for compensation. He went back to his truck. There was no settlement and he was happy.

Case no. 4 is a bakery salesman, age 24, a big powerful fellow, with no nerves in his body. He was 4 days in the hospital, with 5 months' disability. His hospital bill was \$33, and he went back to work after receiving \$388 for compensation. This fellow, instead of being a bakery salesman now is an instructor in bakery salesmanship; that is, he goes out on the truck with a new man to break him in, but I

believe that he works as hard as the fellow he is teaching, or as hard as he ever did when he was a bakery salesman. The point is, that he gets \$2 less a week now, so he honestly does not really belong as a closed case. He gets \$2 a week from the insurer.

Mr. KINGSTON. Are these all compression fractures?

Dr. ROGERS. Yes; all compression fractures of the vertebral body, a true broken back, not of the transverse processes.

Now, for the averages—37 days in the hospital; 5.7 months' disability; \$170 hospital bill on the average; and \$500 average on compensation, raised by the circumstances that we had in this settlement [pointing].

[Slide.] Now, the surgical principles. The penalty and failure of these fractured spines should not be years of disability, nor even months, nor should society have to pay huge bills and then still have many of them 2 or 3 years later as dependents. These people should not be baked and massaged and electrically treated until they lose their morale. Rather, let them be treated as any other fracture case; namely (1) immediate diagnosis; (2) complete reduction; (3) adequate fixation; that is, plaster, splintage, and so forth; and (4) early use of their muscles.

[Slide.] Here is a fractured dislocation. It does not show very clearly, unfortunately, but there is the body of the vertebra above [pointing]. Here is the body of the vertebra below [pointing]. The angle has been knocked off there, a true fracture dislocation, and then the reduction here [pointing].

The mechanism of fractures is that a man falls from a height, and he comes down on his feet like that [demonstrating], or he comes down on his buttocks, or he comes down head first and lands on his shoulders and the effect is the same as that of a jackknife. It jackknives his back and the vertebra is crushed. You can see it more clearly here with this knife [demonstrating]. The man comes down so, and he folds over that way, and crushes his vertebra. The act of reduction is a simple matter, as simple as it can be. It is simply a reversal of the force that produced the fracture. In other words, there is your fracture and there is your reduction [demonstrating with jackknife].

Here is a machine that we use. This is a flexible affair, a framework, and it starts up like that [demonstrating]. The man lies on it, and gradually the ends are lowered like the board of a child's see-saw, until he has reached about this degree of extension. X-rays can be taken right through the machine, and we can prove our correction. While he is still on the frame, we put on his plaster jacket. Here he is anywhere from 3 days to a week after he has broken his back. He is up and around. He has his plaster jacket on.

[Slide.] And he is active; he is using his leg muscles. He is impressed with the circumstance that he is not so very sick after all. He has been discharged from the hospital, and he is able to stoop and lift things. He must learn to stoop and pick up thing that drop on the floor. This picture shows the correct manner. This is an approach to the correct manner of stooping and lifting, and during his period of protection, 4 to 6 months, he learns how to lift correctly, and we hope the habit becomes established. We get busy right away with our exercises and teach him how, as he lies flat,

to arch up his back, thus developing the powerful erector spinae muscles on either side of the vertebra, so that when the jacket comes off we do not have to go through months and months of backache and massage and what not, but his muscles are in good shape.

[Slide.] After about 4 months of the jacket he goes to a back brace, which he wears for about a month or so, during which time exercises are pushed to the limit.

[Slide.] Then he gets up to doing this exercise here [pointing], of bending back 25 times, one right after the other, and holding that position 5 to 10 seconds each time.

Now for fractures of the transverse process. This fracture is in reality a minor injury. Its chief importance lies in the circumstance that it is often erroneously held by the medical and legal professions and the laity to be a grave injury. To interpret this fracture to the public as a broken back, thus implying serious injury of the type of groups 3, 2, and 1, or to connive at such interpretation, is mischievous. Yet such is frequently the case today, and considerable sums of money are thus wasted, and longer periods of disability, with their demoralization, result. A firm adhesive plaster strapping, renewed at 5-day intervals, a week or two of rest in bed, if necessary, and a back belt suffices to give relief during the acute stage. Exercises after 2 to 4 weeks are then necessary with some cases to overcome stiffness.

Now for our results with those cases. Thirty-eight of these fractures were treated in this hospital between 1923 and 1930. Thirty-six were called back and were traced, and the end results noted. Twenty-nine of the 36 or 80 percent returned to preinjury activity in an average of 9 weeks.

Here is a fracture of a transverse process. You will note the jagged line, and as it is a little old, some callus is forming.

[Slide.] This does not show up very clearly, unfortunately, but this is the rudimentary rib type of affair which is not at all a fracture. You will notice the perfectly smooth line here [pointing]. If you X-ray that man 10 years from now, he will have that condition, and he will have no symptoms referable to it.

Chairman MARBLE. Dr. Allen will now talk to you on Peripheral Vascular Lesions of the Lower Extremities.

Peripheral Vascular Lesions of the Lower Extremities

By ARTHUR W. ALLEN, M. D., *Instructor in Orthopedic Surgery, Harvard University Medical School*

The normal circulation of the lower extremities in the human being is adequate in our upright position, as a rule, in youth, due to the elastic control mechanism with which we are born and due to the unusual physical activities that go with the growing individual. The adjustment into the more sedentary habits of adult life comes about gradually so that the majority of human beings are able to go through their entire span of life without symptoms referable to their lower extremities. This seems to be the case even in individuals who are on their feet a great deal at their occupations and play. It is, however, a well-known fact that occupation does play some role

in the development of circulatory difficulties in the feet and legs. It is also perfectly true that individuals who lead a sedentary life with as much comfort and relaxation as it is possible to obtain are not immune to trouble from their peripheral circulation. Many factors other than occupation play definite roles. Among these are heredity and habits which may be classified as the chief forerunners of such conditions.

A very considerable number of people develop mild difficulties with their peripheral circulation without realizing that such is the case. This may be manifested by a feeling of heaviness in the legs toward the end of the day or a sensation of fatigue which may amount to actual pain. Nature has a tendency to adjust these mild disorders, based on a beginning inelasticity of vessels with increasing age. This comes about by the dilatation of smaller vessels supplying the extremities involved, thus adequately carrying a sufficient amount of blood to the parts so that symptoms may never progress beyond this prodromal stage as collateral circulation keeps pace with the sclerotic processes to which we are all subject. On this natural compensatory mechanism depends, in a large measure, the continued health and comfort of the individual, and undoubtedly the majority of individuals do compensate to such an extent that they are never cognizant of any real pathological process. In a considerable number of instances this feeling of fatigue may be followed by cramp-like pains in the calves of the legs at night and may be relieved as the patient breathes rapidly into a paper bag, thus producing an excess of carbon dioxide which eliminates the spasm instantly. Another favorite method of relieving such a cramp is for the patient to get up and rub the leg or walk about the room. The next phase of the difficulty is usually manifested by a cramp-like pain which develops when walking. This may manifest itself in the sole of the foot, but more often in the calf of the leg, rarely in the thighs and gluteal regions. This comes on after walking a certain distance. The patient is brought to a halt on account of the pain. After a few moments rest the pain disappears and the patient can walk a distance equal to the one which brought on the first pain, only to have the cramp-like pain return. This has been termed "intermittent claudication" and is the most common and prominent symptom in peripheral vascular deficiency in the lower extremity. If the patient determines that he will progress in spite of the pain, he will find that he produces marked soreness in the muscles involved which will eventually prevent his walking almost entirely. As the occlusive disease progresses, the patient finds that the distance which he can cover before a pain will appear in the muscle becomes gradually shorter. They are apt not to appeal for help from their physician until they are limited to a few hundred yards or less. Many of these cramp-like pains do appear in the sole of the foot and the patient is inclined to attribute them to fallen arches or his physician to foot strain. It is perfectly true that arch supports do seem to help some of these individuals, particularly if they are made of sponge rubber covered with leather. The physician, however, should be able to recognize this very definite symptom and with it he will find other manifestations which are recognizable at this stage of the disease, such as feeble or absent pulsation in the foot involved.

Following this stage of the disease, there may be slight trauma from paring a toe nail too closely, injuring a callus, or any simple injury which may happen while at work. Ulcerations developing on deficient circulation are excruciatingly painful. The patient's sleep is disturbed and the physician finds that they do not heal normally. From such ulcerations serious infection, which would be well taken care of in normal circulation, may manifest itself in such a way as to produce severe fulminating lymphangitis, progressive gangrene, etc., necessitating early radical amputation. It is this stage of the disease that we most wish to avoid, and if the true condition of the circulation of the foot can be recognized early, it should rarely be necessary to sacrifice the extremity.

The various known pathological states involving the peripheral circulation may be divided into two main groups: One, those involving a gradual obliteration of the vessels supplying the part, comprised of (a) obliterative disease based upon arteriosclerosis; (b) obliterative disease based on thrombo-angiitis obliterans. A differential table helps to sort out these two obliterative types from each other. Two, those based on vasomotor spasm of the vessels. Fortunately, in this second group, the disease appears in the upper extremities primarily and is usually more obvious, so that here we are concerned almost entirely with the obliterative diseases.

Differential Table

One must mention the fact that there is a type of arteriosclerosis which is very fulminating, appearing at an average age of fifty, described by Monckeberg, the only differential characteristic being that this disease is based upon the pathological finding that the middle of the artery, rather than the intima, seems to be involved. It is less responsive to treatment than arteriosclerotic gangrene of the senile type and is frequently found on the pathological reports on amputated limbs in the diabetic. Otherwise, it is rare and need not concern us here.

Differential diagnosis

	Vasomotor disturbances— primary vasomotor imbalance, Raynaud's disease	Obliterative arterial diseases	
		Thrombo - angiitis obliterans, Buerger's disease	Arteriosclerosis, senile type
Average age.....	30.....	40.....	60.....
Sex.....	Female, 70 percent.....	Male.....	Both.....
Nationality.....	All.....	Hebrew, 40 percent.....	All.....
Duration of symptoms.....	Years.....	Years.....	Months.....
Extremity first involved.....	Upper.....	Lower.....	Lower.....
Symmetry.....	Bilateral and symmetrical.....	One side at a time.....	One side at a time.....
Gangrene develops.....	Late.....	Late.....	Early.....
Local palpation of vessels.....	Normal.....	No pulsation.....	Faint or absent.....
X-ray of vessels.....	do.....	Normal.....	Show marked calcification.....
Vasomotor index.....	Marked.....	Mild.....	Slight.....

Diabetes.—Diabetes produces arteriosclerosis at an early age. Joslin has found marked arteriosclerosis in young adolescents who have been diabetics since childhood. The degree and extent of

arteriosclerosis in the diabetic are definitely related to the length of time the diabetes has existed. People who develop diabetes rather late in life are apt to show more peripheral arteriosclerosis at the age of 60 years than a nondiabetic at the age of 70 years. This should be borne in mind, as the difficulty with which peripheral injuries heal in the diabetic is well known.

Senile arteriosclerosis, which is by far the most common form of all arterial obliterative disease, may never produce any symptoms in the legs that are recognizable by the patient as such. In addition to the slow progressive type of mild symptoms, followed eventually by ulceration and gangrene developing rather rapidly, particularly following trauma, we have sudden occlusion in an otherwise narrowed vessel. This occlusion is undoubtedly due to thrombosis which may be brought about by strain or injury. It more frequently comes about without any unusual strain. Therefore, it is difficult to evaluate sudden occlusion of this type if it occurs in the laboring man while he is actively engaged at work. He and his physician will attribute his sudden disability to his work. I believe that anything short of actual impact over the artery during labor should not be considered as a factor influencing the thrombosis. These sudden occlusions are apt to produce very acute symptoms—pain, blanching, discoloration, and in many instances, eventually gangrene of more or less degree. The individual who has gradually occluded his main channels and is dependent wholly on collateral circulation is much less apt to have a sudden thrombosis of a serious nature than one whose main vessels are still patent but narrowing. It must be emphasized in this disease that the patient may have very little warning of impending danger with prodromal symptoms lasting a short period of time prior to the complete occlusion. In a large series of these cases, the average duration of symptoms prior to hospitalization was less than 6 months. A certain number of these had their disability precipitated by injury of one sort or another, frequently of a very minor character. Fully as many others were apparently entirely spontaneous. The fact must be borne in mind that in all of the individuals having arteriosclerotic obliterative disease, there are comparatively few who develop symptoms or conditions of sufficient seriousness to warrant hospitalization. By far the majority of such individuals do not progress beyond the prodromal stage. They acquiesce to their discomforts and, either through their own devices or through the aid of a physician, tide over their period while collateral circulation is developing to an adequate state and eventually become comfortable. Those who do behave in this manner are apt to be able to lead a comparatively normal but somewhat restricted life.

Thrombo-angiitis obliterans form the next large group of cases of obliterative disease. This is characterized by a slow progressive occlusion of the main arteries and veins supplying the extremities in young men. This produces, after a period of time, intermittent claudication either in the foot or in the calf of the leg, or both, with considerable discomfort and feeling of heaviness after use. The foot becomes quite cyanotic on marked dependency. This cyanosis is not the ordinary bluish discoloration but has a distinctly reddish-blue tint and is usually spoken of as "rubor." When this

sort of an extremity is elevated to an angle of 45 degrees, it takes on a wax-like, cadaveric hue in a very short period of time. Occasionally (in approximately 20 percent of the cases) there are small areas of superficial phlebitis which manifest themselves by reddened, painful, superficial areas which are tender to touch and which may disappear in one location only to appear in another on the same extremity. This has been termed by Buerger as "migrating phlebitis." If injury is superimposed on an extremity in which this disease has been slowly progressing over a period of several years, one finds that healing will not take place in a normal fashion, that the open lesion becomes excruciatingly painful, and that it has a tendency to slowly progress, involving more tissue, even to a whole digit, or at times the entire foot. These open lesions are so painful that they disturb sleep. They are very much more painful than a similar lesion occurring in an arteriosclerotic. This pain prevents the patient from doing exercises, having proper dressings, getting a sufficient amount of rest, and takes away his appetite. Thus, usually, the individual enters the hospital in a poor state of nutrition, with his nervous system quite upset, so that he is found apprehensive, sitting up with his hands clasped about the knee of the affected extremity, rocking to and fro, in the daytime sleeping a little bit, but at night restless. His fingers are nearly always stained with the tar of cigarettes. He frequently begs for amputation or for opiates to allay his pain. He may have already become a drug or alcohol addict.

In the vasomotor group, we have much less serious lesions in the lower extremities than in the upper. Usually, first we have multiple phase color changes, noticed on exposure to cold and dampness. The digits are noted to go dead white, only to become cyanotic, then red, and as the attack wears off a normal appearance returns. These episodes may be repeated at first only rarely, and finally to manifest themselves many times a day. The length of the attack may vary from a few minutes to an hour or more. If this condition progresses, the continued state of cyanosis may come about with small changes in the subcutaneous tissue producing a thickening which is a firm, scar-like tissue (scleroderma). This may eventually occlude the vessel to such an extent that actual gangrene takes place in the terminal phalanges. In addition to this spontaneous variety, which seems to come on without any warning in nervous and high-strung individuals, we have a type of secondary vasomotor spasm which may come on after peripheral injury. The most common example of this is causalgia as described by Weir Mitchell, occurring following injury to the digit supplied by the median nerve. This may produce such pain that repeated amputations have been done for its relief. This may be true of other nerve distributions, particularly in the dorsum of the foot where painful ulcerations may develop after injury. These may cause prolonged disability and produce a fertile field for all kinds of therapy, most of which are futile. Actual division of the sensory nerve supplying the part is the only effective method of treatment, and this often fails.

At the Massachusetts General Hospital, we have found that certain routine studies and certain routine forms of treatment have been helpful in cases of peripheral circulatory disorders. They are appli-

cable to nearly every patient falling into this category. The routine treatment is particularly helpful to those with the obliterative type of disease.

Routine Study for Cases of Peripheral Circulatory Disorders

1. Duration of symptoms: When intermittent claudication began, when and how ulceration started, etc.
2. Date and character of injury, if any. Date of ulceration or gangrene. Date disability began.
3. Extent of infection, lymphangitis, ulceration, and gangrene.
4. Description of lesion and vessels. Indicate volume of pulse in vessels, one plus to four plus.
5. Length of time for blanching to occur on elevation, and cyanosis on dependency.
6. Surface temperatures of extremities.
7. Oscillometer readings.
8. Roentgen-rays of vessels of extremities.
9. Photographs of lesions.
10. Degree of pain; i.e. constant, at night only, on change of position, use, etc.
11. Blood sugar on all diabetics—All diabetics and all infections are to be considered as emergencies. Blood cultures on cases with marked infection. Cultures of infected lesions.

After this study has been made, or while it is being carried out; the following routine treatment should be started:

Routine Treatment for Cases of Peripheral Circulatory Disorders

1. Bed with Balkan frame. Extremities elevated on one pillow—heels off mattress.
2. Cradle with electric lights in winter, without lights in summer.
3. Daily foot hygiene (careful application of soap solution followed by alcohol and lanolin).
4. Refer to the podiatry clinic.
5. Open lesions treated with Dakin's solution throughout the day. Those not badly infected treated with boric ointment at night.
6. For pain—*aspirin*, *barbituric-acid* compounds, etc. (never opiates).
7. Buerger exercises. Position I.—From $\frac{1}{2}$ to 2 minutes, depending on time blanching occurs. Position II.—From 1 to 3 minutes, depending on cyanosis or severe pain. During each position II, have patient dorsiflex, plantarflex, invert, evert, flex toes, extend toes *once*. Position III.—Five minutes, feet wrapped in warm woolen blankets, the extremities to be level with the heart.
8. Force fluids to four quarts a day. Liberal diet.
9. Eliminate tobacco.

Etiological factors.—The actual cause of obliterative arterial disease has not been explained on any specific basis. Individuals who develop arteriosclerotic obliterative disease are not always those who have marked generalized arteriosclerosis. However, these individuals will usually be found with sufficient calcium in their vessels to show clearly in X-ray films. On the other hand, we find many vessels sufficiently calcified to show plainly without any peripheral circulatory manifestations. The question of hard work, whether it be mental or physical, has often been cited as a forerunner of arteriosclerosis. Alcohol and tobacco have also been blamed. Heredity probably plays a greater role than all other factors. We do know that chronic diseases, particularly diabetes, have a marked tendency to favor the development of arteriosclerosis.

One would think from the pathological picture in thrombo-angiitis obliterans which show marked evidences of chronic inflammation

that some specific organism would be isolated in this disease. Although Rabinowitz did isolate an organism from patients suffering with this disease by using leeches to suck blood from diseased tissues, this work has not been confirmed by other observers. The disease rarely, if ever, develops in the female. We have had only one case in our clinic in a woman and although the sections of the arteries are consistent with thrombo-angiitis obliterans, the patient has a luetic history and until further study of this particular patient can be made we must withhold the absolute diagnosis for the present. It has been found in greater instances among the Hebrew race, although no nationality seems exempt, as it is very common among the Chinese and Japanese. It must be very rare among the Negroes as the questionable female case described above is the only colored person whom we have seen that even suggested thrombo-angiitis obliterans. Although our clinic is located in a community composed of a high percentage of Jews, only 40 percent of our cases have been of this race. Tobacco has been blamed for the disease by some of the earlier observers, as many of these cases are heavy smokers. We are sure that it is not the etiological factor, because a few of the typical cases have not used tobacco at all. Certainly tobacco could not explain the ratio between the male and female distribution of this disease in this generation. One must admit, however, that tobacco produces a definite vasoconstrictor influence on the vessels, reducing the volume of blood flow through the hand on an average of 50 percent during the smoking of one cigarette (Freeman and Lamson). It requires approximately 30 minutes for the extremity to recover from this vasoconstriction and for this reason, tobacco should be entirely eliminated in the treatment of this disease. Inasmuch as the disease is limited to men, one wonders whether or not the etiological factor will not eventually be based on the sex hormone.

Special forms of therapy.—Many forms of therapy have been advocated by various individuals interested in this subject. Among the more prominent ones may be mentioned the use of sodium citrate solution intravenously, large quantities of Ringer's solution by duodenal tube, nonspecific foreign protein, peripheral nerve block, interruption of the sympathetic nervous system supplying the part, and alternating negative and positive pressure in a large boot. All of these methods of treatment are associated with the general measures described above and a considerable amount of detail on the part of some individuals interested in the disease.

Also, one must not lose sight of the fact that time is a tremendously important factor, that if the disease does not progress so rapidly that collateral circulation fails to keep pace with its progress, eventually the localized areas will heal and the patient again become ambulatory. Amputation has often been done to relieve pain. For this reason we have found that a denervation of the involved foot by actual crushing, cutting, or injecting with alcohol the peripheral sensory nerves supplying the part has allowed a twofold benefit to take place (Smithwick and White). In the first place it eliminates all vasoconstrictor influence to the part and in the second place it makes the patient comfortable so that adequate dressings can be done, proper rest and sleep can be obtained and proper exercises instituted. We feel that many extremities have been saved by this

procedure. Sympathectomy, whether it be periarterial or gangli-onectomy, has not been efficient in the treatment of thrombo-angiitis obliterans for the reason that the vessels are so narrowed and inelastic that vasodilatation beyond a very limited range is not possible. This has failed in relieving the painful ulcerations and we feel it is much less likely to produce a beneficial result than blocking of the sensory nerves. The use of foreign protein, particularly typhoid vaccine, has been of considerable value but is not as effective as some of the newer methods of treatment. We have failed to see any specific improvement in cases treated by sodium citrate injection or by large quantities of Ringer's solution by duodenal tube. However, we must admit that our experience with this method of treatment has been somewhat limited as the results obtained in the few cases treated in this manner have not encouraged us to pursue the methods further.

We feel that the greatest advance in palliative treatment has been brought about by the alternating negative and positive pressure on the extremity enclosed in a glass boot. This is a modification of Biers' hyperemia which was suggested many years ago for the treatment of this disease. Much credit must be given Landis for his experimental data on this subject, showing that theoretically this is the most efficient way of developing collateral circulation. However, to Reid and Herrmann, of the University of Cincinnati, we must give the credit for working out the detailed methods of applying this principle. They have developed a so-called "Pavaex" machine which consists of an electric pump which will alternately exhaust part of the air from a glass boot enclosing the foot and apply positive pressure. The machine is so arranged that varying degrees of negative and positive pressure and the duration of each cycle can be regulated. We feel that this offers the greatest possible aid in the treatment of obliterative arterial diseases of all kinds, including peripheral embolus. At present we feel that this apparatus will become a part of the standard equipment of every well-regulated hospital and prove as essential to proper treatment of these conditions as the respirator is to the proper treatment of poliomyelitis.

Rehabilitation.—One must not lose sight of the fact that these individuals are invalided for long periods of time, many of them confined to beds for weeks. If sufficient collateral circulation has been established, one must use utmost care in getting them up and about again. We make it a rule that the first time out of bed for such a patient should be one-half minute out of the hour. This is gradually increased and the patient should not be discharged to his home until he is able to walk for at least 5 minutes at a time without producing extreme cyanosis in his extremity. One must not lose sight of the fact that while one extremity is being treated, the other extremity must be kept in good condition without being subject to pressure sores, particularly of the heel, and that rehabilitation of the better leg is also important as usually both extremities have deficient circulation.

A great deal of care must be taken of the elderly individual who has prodromal symptoms not sufficient to hospitalize him, and the following treatment has been worked out for ambulatory patients.

This routine is applicable to the arteriosclerotic with and without diabetes and to the milder cases of thrombo-angiitis obliterans. These general directions are printed on a sheet along with diagrams of the postural-change exercises and modified to suit each individual patient. These instructions are as follows:

Care of the Feet

(Peripheral Circulatory Clinic—Massachusetts General Hospital, 1932)

General directions

1. Wash feet each night with soap and warm water.
2. Dry feet thoroughly; rub gently with rubbing alcohol (70 percent); dry feet, then rub well with tiolet lanolin.
3. Always keep feet warm; woolen socks in the winter and white cotton socks in warm weather; use a clean pair each day.
4. Use loose-fitting bed socks instead of hot-water bottles, bags, or electric heaters.
5. Wear shoes of soft leather without box toe, and which fit but are not tight.
6. Keep legs elevated on a chair as much as possible when sitting.
7. Cut toe nails only after a foot bath and in a good light; cut them straight across.
8. Do not cut corns or calluses.
9. Do not wear circular garters.
10. Do not sit with your legs crossed.
11. Do not use strong antiseptics on your feet, such as sulpho-naphthol or iodine.
12. Go to a doctor at the first signs of blister, infection, ingrowing toe nail, or trouble with bunions or calluses.
13. Drink large amounts of water, eat plenty of green vegetables and fruits.
14. Reduce your smoking to a minimum; one pipeful twice a day or five cigarettes a day.
15. Have a member of your family examine your feet once a week.
16. Do your exercises faithfully.

In conclusion, we wish to emphasize the necessity of recognizing an extremity with circulatory deficiency. For every individual who appeals to a physician for pain in the foot or leg, for discoloration, for ulceration which does not heal, or for cramps in the calf of the leg at night, the physician must assure himself that there is adequate circulation. If the routine study is followed, the pulses are felt, the oscillations above the malleoli are obtained by the use of an ordinary blood-pressure machine, he can ascertain with considerable accuracy the state of peripheral circulation. Any individual who suffers an injury to his extremity which causes undue pain or a lesion which fails to heal normally will show signs of deficient circulation if these routine studies are followed. It is imperative that adequate treatment to develop collateral circulation is established early following such trauma or the terrific economic loss of major amputation may have to be faced. We must urge physicians to attempt an early diagnosis and conservative measures of treatment, as the percentage of major amputations in these conditions should be low.

[Dr. Allen here presented a number of patients, at that time in the hospital, who were being treated for peripheral vascular lesions of the lower extremities, describing their cases and the treatment as follows:]

These are patients who happen to be in the hospital at this time. The first individual is 60 years of age. He came into this hospital from Fall River in 1931. At that time he had a gangrenous toe, following ulcers, of 6 or 7 weeks' duration, and some lymphangitis of the ankle. He was found to be a diabetic. The toe was removed under spinal anesthesia, and he recovered and got along all right until this month (September 1934) when he had the misfortune to injure his right toe. He is a janitor, and dropped a log of wood on his toe while he was about his work. He was wise enough to know that it would not heal easily, and he immediately came to the hospital. This is an illustration of a fellow who was educated to his possibilities, and he is a pretty wise fellow. I think he did consult his physician first. You see, he got a good result from the loss of his toe 2 years ago; has been able to work ever since and has never felt better in his life. He admits that he ran out of Bendix solution about 2 months ago, and has not bothered to test his urine during the past 2 months, but he has been pretty careful about his diet. The probabilities are that, in spite of the fact that there are no pulsating vessels in that foot, with this comparatively minor injury to a comparatively minor toe he can be taken care of without the loss of the leg. He has developed over a period of years a great deal of collateral circulation. His capillary beat is excellent.

The next individual is also a diabetic. He is a cook. Cooks are apt to have diabetes. He is 53 years of age. About a year ago he was not feeling very good, and went to his physician, who made a diagnosis of diabetes. He was put on a diet, which he tried to live on for a good while. That man finally developed soreness in a callus which was on the bottom of his foot—a fairly typical diabetic lesion. That involved a callus just below the fourth toe, one of the hardest places in the foot to drain, but as you can see here [pointing] it has been drained. Since August 26 we have given up a month to this man to see whether or not we could heal this lesion. In a diabetic, where you have infection without adequate circulation, it is very difficult to heal such lesions. We give him a fair chance to see whether anything can be done, but this infection will soon creep down the tendon into the phalanges of the foot. We know that if this man could live a year of his life under ideal conditions, possibly he might get something that he might walk on. But, in spite of the fact that he is only 53 years of age, he is really very much older than that as far as his vessels are concerned. He has had diabetes a long time and has marked arteriosclerosis, and he has no pulsation whatever in his foot. Dr. McKittrick has shown that if you get an individual of that set-up, although you may heal the foot, the patient rarely, if ever, is able to use it; that is, the patient becomes sufficiently incapacitated, due to the necessary rest during the process, so that it is rarely that he is able to use it. Now he is still pretty active. We laid him up for a month, and now we have come to the conclusion that the sensible thing for him to do is to have a Gatty-Stokes amputation and do a better job. He will be on his job again in 4 weeks, and that is the proper and the sensible thing to do from his point of view, let alone the economic point. In other words, we try to set a time limit on these cases, and if the patient refuses that advice, why then he goes home and sits around,

and if he has someone to look after him the lesion may eventually heal. But such patients do not become economic units of society again.

This individual is 65 years old. He has simple arteriosclerotic gangrene, with calcified vessels throughout his extremities, and a long period of disability. This leg was lost through arteriosclerotic gangrene in 1933, just about a year ago. This looks like a Gatty-Stokes, but, as a matter of fact, it is not. It is a very excellent tenoplastic amputation and just about as good as a Gatty-Stokes, but the patella is gone. In the Gatty-Stokes, of course, the man bears the weight on the patella. The Gatty-Stokes is far more serviceable when a man has to stand on his feet a long time, but beyond a certain age group we believe that this amputation here is less complicated and probably as effective.

Someone wishes me to describe a Gatty-Stokes. I hesitate to do it, as I am sure you are all familiar with it. The incision is made very much as though you were going to repair a fractured patella. The condyles of the femur are sawed across at a level where they are just the diameter of the underneath side of the patella. The underneath side of the patella, the cartilage portion, is sawed off. Then the amputation is completed through the crease in the popliteal space. That brings the long flap over the end and allows the freshened undersurface of the patella to rest on the sawed-off portion of the femur, and that eventually develops a bony union between the underneath surface of the patella and the femur, so that you get the advantage of all your normal collateral circulation. It sounds like a complicated procedure, but it is one of the most carefully planned and simplest operations that are commonly done, and it is a very useful amputation.

Now, this man comes back here a year later, as many of these arteriosclerotics do, but not because he did not have a very careful set of instructions as to how to look after this leg. We furnish these individuals with careful instructions. In the first place, we get them so that this open leg can be depended for a period of 5 minutes without too much congestion before he leaves the hospital. The circulation in the remaining leg must be adjusted before you send the patient home. If you do not, he will be back in a couple of weeks with trouble in the other leg. Having done that, such patients are furnished with a very detailed set of instructions about how to look after themselves, and naturally, of course, a lot of them, the arteriosclerotics, pass on with other ailments of one sort or another, before they would get into trouble with the opposite side. It is not at all unusual, however, to have these individuals come back with difficulty in the other leg. This man has a pulseless foot, and he has so much pain that it has been necessary to block some of the peripheral nerves, a method which was developed in this hospital and which we believe offers more to an individual with painful extremities that need dressings, where there is reasonably adequate circulation, than any of the other modern methods of treatment. It is particularly advantageous in thromboangiitis obliterans and makes it possible to save at least twice as many legs as we can save by any other method. This man has had a fairly recent blocking, apparently of the posterior tibia, and

he had his peroneal nerve blocked up here previously, possibly 2 weeks ago here [pointing], and possibly 5 days ago there [pointing]. Having done that, we give him all of the possible vasomotor index which he has; that is, all of the elasticity in his vessels that it is possible for him in his arteriosclerotic state to manifest—he will manifest with these nerves blocked. In addition to that, he has loss of pain. He can sleep and, having lost the pain and tenderness, he can have proper dressings. He can take exercises. So it is possible to expect this lesion to heal, so that he may again get up and walk on this leg. It is a warm foot, with good color, and it looks quite hopeful that it may heal.

When he reaches a stage that we think is nearly foolproof, we will send him home and let him be treated by his own physician or the district nurse until he either gets in trouble or it heals up.

This next man is a typical arteriosclerotic as he now presents himself, but the interesting thing about him is that all his life he has had cold hands and cold feet. We have traced that back as far and as carefully as we can, and we do not believe that it was a true ramus disease originally, but he had a ramus tendency. There was something the matter with the sympathetic nervous system that caused him to have more vasospasm than a normal individual. He has lived to be 71 before getting into trouble, and now he comes in presenting a typical case of senile arteriosclerosis. These groups of cases all blend one with the other. The chronic vasospasm that develops in these people must play a role even in a man as old as this one. I know it plays a role in a good many younger individuals. It is difficult sometimes to distinguish between the thromboangiitis obliterans and senile arteriosclerosis. The thromboangiitis obliterans may have been present for some years. The collateral circulation has kept pace, and when the patient presents himself for treatment he is in the arteriosclerotic group. The vessels in the case of thromboangiitis obliterans will eventually become calcified, so that it is hard to tell what has precipitated the disease.

Just one more demonstration. We have always treated these individuals by hygienic measures, postural change exercises, and relieving their pain by mechanical means, not by drugs, and have helped to eliminate complicated procedure. The results have been pretty good, as they always are where there is a group of men who take a special interest in a subject. The results are always better than when the cases are handled by everybody connected with the hospital. Now, it seemed as though we had perhaps gotten as far as we could on this business, when the old Bier's hyperemia comes to life again.

Years ago many of you have seen Bier's hyperemia used in the lower extremities in treatment of deficient circulation. Dr. C. A. Porter, late of this hospital, used to believe that we ought to try to do something to reestablish that method of treatment. Dr. Edward Richeson, who came along, felt that something of the kind might eventually be worked out, but nobody could get going. We all had ideas along different lines and nothing was done about it. Finally, Landis, when working with Lewis in England, and then coming over to Philadelphia, proved experimentally that alternating negative and

positive pressure was a perfectly feasible method of treating inadequate peripheral circulation. These experiments were entirely in the laboratory.

Now it turns out that for some 10 years or so, Reid, at the University of Cincinnati, pursued some work along this line, with an enthusiastic and untiring helper by the name of Herrmann, and they have worked out this elaborate treatment which they call "Pavaex." Reid has been interested in this method of treatment for a long time. Many early crude pieces of apparatus were made, but it was not until he got hold of Herrmann, who was quite a mechanic, physicist, and surgeon, and also a research man, that this unit has been developed they call "Pavaex"; in other words, passive vascular exercise. That is what it stands for.

This is a very complicated machine, and I cannot tell you very much about it, except that we connect it to 110-volt alternating current, which we do not have here or I would connect it for you. We do have it in the wards. This heavy rubber hose goes into this glass boot. There is an instrument here, so we can tell how much negative pressure and how much positive pressure there is. This fits with a rubber cup around the thighs, so that when it is adjusted we can get 80 millimeters of negative pressure, which is the average for the negative pressure for an individual with thromboangiitis obliterans. The arteriosclerotics must have less. Then it automatically alternates to about 40 millimeters of positive pressure. In other words, the blood is drawn into the vessels and there dilated and then gently pressed out again, and there are four cycles alternating in negative pressure per minute on that machine.

This is an experimental unit, and has been sent here for experimental purposes. We are rather enthusiastic about the prospects from this piece of apparatus, although as yet we are not ready to make any statement. We have had some very serious catastrophes with it. In other words, you cannot put any foot with an open lesion into this thing, or you will massage the infection right up the lymphatics. You must be very careful about the amount of negative pressure that you use. This machine automatically produces negative pressure beyond a certain point, and it will not produce positive pressure beyond a certain point. There are several safety devices on it, too. You can imagine that this machine is going to be expensive. It is going to cost a lot of money. Herrmann and Reid have about 12 of these machines placed over the country in various clinics where they are interested in studying this subject, and eventually we will be able to get together and evaluate this method. It is not the great cure-all. It is not the sort of thing that you can have in your office, now, at any rate, and have it safe to use. It is not going to be the only method of treatment; I mean, it is going to be an adjunct. But we believe that it is the most important recent development in the treatment of these diseases.

DISCUSSION

Chairman MARBLE. We have a pile of questions that we would like to ask each and every one of the speakers. We will each have a minute or two in which to answer the questions, and that is all, because after that we are going to show you the ether film.

Dr. Aub, will you please answer your questions?

Dr. AUB. The first question is, "Would you pay compensation for disability or death following nephritis or arteriosclerosis where there has been exposure to lead, but no proof of the usual symptoms of lead poisoning?"

I think the only way that you can get your objective evidence that the death was really due to lead is like this: It is rather easy in case of death, because all you have to do is to have a few of the organs analyzed for lead. If there is a large quantity of lead present, then there is some evidence of lead damage.

The next question is, "Is stippling always present in early lead poisoning?" The answer to that is, yes, at one time or another. You get it with every case, practically, of lead poisoning, only one has to know stippling when one sees it.

The next question is this, "Is compensation neurosis common to other cases than lead poisoning?"

Whenever I talk about compensation neurosis, people always ask about it. The fact is that compensation neurosis is common to everything that comes up before industrial accident boards. Another question here is whether I had seen many of these cases. Everyone who sees the cases that come up before an industrial accident board knows that a certain amount of them are tinged by compensation neurosis, and many of them are only that.

Here is a question, "Is lead poisoning caused by inhalation of dust or fumes, as well as from being conveyed into the mouth?" The answer is that it is mostly from dust and fumes, and the old idea that it was the worker's fault, because he did not keep his hands clean, was simply a method of avoiding responsibility by the manufacturers. Typical lead poisoning is due to fumes and dust, and if you get rid of the fumes and dust you get rid of lead poisoning.

Here is another question, "Will X-ray pictures show lead stored in bones?" That has been coming up in accident boards recently. X-ray only shows lead in bones in growing children. In adults or people who are exposed in industry, you cannot find lead in bones by X-ray.

Next question, "Granted a person has had lead poisoning, but is supposed to be cured, with all symptoms gone, is it safe for him, even so, to go back to lead exposure?" The answer to that is that a person who has had lead poisoning has lead stored in his bones. Also, he is very apt to be a person who is susceptible to lead poisoning. Both those things imply that he ought not to go back to a lead hazard. If possible, he ought to get work at something else. But from an economic point of view, in my experience it has been extraordinarily difficult to make men leave a skilled job to take up another job which is not skilled and for which they are not trained. The only thing you can do under those circumstances is to teach them that fumes and dust are the way they get lead into the body, and that anyone, if he knows that, can avoid it. For instance, many people get lead poisoning through the use of sandpaper, and, if they realize that, they can use wet sandpaper, which will not cause dust but which will serve their purpose just as well.

Chairman MARBLE. Now, Dr. Rogers will answer his questions.

Dr. ROGERS. The first question is, "Do you find arthritis in your cases following fractures?" We have not found true arthritis in any of our cases, but we have found the spur formation in 85 percent of our cases. Almost every case forms some spurring following fracture. Forty percent of our cases have a complete bone bridge between the fractured vertebra and the one above or below.

Next question, "How about removal of foci of infection immediately following inspection of injury to the spine?" We have had no success with this, and because of our experience we have given it up.

The next question is, "In which cases of back injury if any did you recommend bone grafts?" We did bone grafting in six cases prior to the reduction series. End results in those cases are not as good from the time standpoint and from the standpoint of the patient's morale—from the standpoint of the amount of work you have to put in to bolster up their morale, reassurance, and that sort of thing. The period of disability in those cases I think was 10 months. Our period of disability now averages 6 to 8 months without operation. The operation is rather apt to magnify the injury in the patient's mind. He has a major procedure. He has a bone graft, a major procedure. That accomplishes the very thing we wish to prevent; namely, the fact that the patient dwells on his broken back. He is told by all his friends that he has a broken back and will never be any good any more. That is our greatest enemy—it is not the fracture; it is the patient's morale. The return to work was prolonged and the results were not so good.

The next question is, "We have been repeatedly told that a man who has suffered a moderately severe compression fracture of the spine will never be free from more or less backache which will prevent him from engaging in hard work. Do you agree with that?" Well, we reviewed the cases between 1923 and 1928 where old-fashioned methods were employed. Ninety percent of those cases—diligently treated, to be sure, constantly reassured, kept in close touch and contact with physicians who played the game with them and did not give them any false slant on the magnitude of their trouble—returned to industry in an average of 24 months—2 years. In the reduced cases, those figures I gave you, 85 percent who were economic independents in an average of 8 months were cases personally seen by me and it was determined that 65 percent were doing exactly the same work which they were doing before they were hurt, whether arduous or mild. We fight that statement, that the man will never be any good, everlastingly, both with the man and with families and friends and everybody. I do not agree with that statement.

The next question is, "How about multiple fractures of the spine, two or more units affected?" Not uncommon at all. Cases of fractures above the level of the eighth dorsal vertebra, you cannot render ambulatory within a week or two as you can those cases below that level, the reason being that everybody has a little bend in the back, and if you hyperextend and correct the fracture, reduce it, and then get the patient up, the circumstance that the vertebra above hangs on the front lip of the crushed vertebra will refracture it. We have proven that. Do not get those cases of fractures above the eighth dorsal vertebra up out of bed before 8 weeks. During those 8 weeks

you have to work a lot harder than you have to work with cases below the eighth dorsal vertebra, because you are keeping them in bed, and you have to exercise them—work unceasingly on them as they lie in bed, everlastingly work at them. It is a pretty dull, uninteresting thing to do to lie in bed and take exercises, and most people do not want to do it. They just have to be driven to it.

Chairman MARBLE. Have you any questions for Dr. Allen?

Mr. HARTWIG (Oregon). How do you differentiate in diagnosis between gangrene produced by a diabetic condition as compared to gangrene produced by freezing?

Dr. ALLEN. That is a hard question to answer. Of course, we have many cases of frostbite that would not become gangrenous. If you have reason to suppose that the circulation has been normal before, and there is a definite history of freezing, then I think you have to assume that freezing is the important element.

[Dr. Donoghue voiced the thanks of the medical committee and of President Parks, president of the association and also chairman of the Massachusetts Industrial Accident Board, to the doctors who participated in the day's program.]

[At this point the motion picture First Operation under Ether was shown.]

[Meeting adjourned.]

WEDNESDAY, SEPTEMBER 26—NOON SESSION

Chairman, JOSEPH H. SHORTELL, M. D., Surgeon Boston City Hospital

Chairman SHORTELL. The next speaker has a very wide experience in industrial accident cases, and had the opportunity of being a medical examiner for one of the large insurance companies. I am sure that whatever he has to say is worth listening to. I want to introduce Dr. William F. Dolan, who will speak on a Study of the Cause of Increasing Disabilities in Fracture Cases.

Study of the Cause of Increasing Disabilities in Fracture Cases

By WILLIAM F. DOLAN, M. D., *Visiting Surgeon St. Elizabeths Hospital, Boston, and Medical Director Employers' Liability Assurance Corporation, Ltd., Clinic*

This paper is a study to determine, if possible: (1) Whether or not there is an increasing disability period in industrial accidents, particularly in fracture cases. (2) If so, what are the causes? (3) Methods to meet this situation.

The material studied consisted of a detailed analysis of disabilities in fracture cases as reported to the Department of Industrial Accidents of Massachusetts over a period of 10 years between 1922 and 1932. In all there were 37,349 fracture cases. These were analyzed and classified into the following groups: Fatal cases, permanent total disabilities, permanent partial disabilities, and the balance of temporary disability cases which were grouped according to the duration of disabilities, from the shorter disabilities of a few days up to the disabilities of weeks, and in the chronic cases a classification was used of 13 to 26 weeks, 26 to 52 weeks, and finally of cases lasting over 1 year. As far as I know, this statistical study is unique.

The study shows that, apart from the cases with short disabilities (up to 26 weeks), which would presumably include the minor injuries, the curves are all running upward. In other words, we find a definite sharp increase in the disability periods in our major cases.

The study is limited to fracture cases, excluding other injuries, as such cases fairly represent a group of cases in which surgical progress has admittedly advanced greatly, and this sample of fracture case lends itself to a study of this sort, because the disability period naturally would be longer than in nonfracture cases, and it also represents one of our most expensive groups of cases.

This very definite prolongation of disabilities is worth detailed study which, I believe, is explained by a group of nonmedical causes. It is found in the trend of decisions by industrial accident boards, by the depression in industry, in the increasing trend toward "doles" by such claimants, etc. This will be elaborated later.

The methods to combat this evil, as far as the medical profession is concerned, are best exemplified by the well-organized action of the

American College of Surgeons, in its studies on traumatic surgery; the use of organized action is here well illustrated. These studies are very extensive. A careful study of the evaluation of the ability of an injured man to return to work is given. We note, especially in fractures: (1) Quickness in action. (2) Coordination, as contrasted with awkwardness. (3) Strength.¹ (4) Security and confidence.¹ (5) Endurance. (6) Safety. (7) Ability to get suitable work.¹

The chairman of the Department of Industrial Accidents of Massachusetts discussed the question with me. His experience dates back 21 years. He comments that the tendency to prolong disabilities need not be limited to a study of fracture cases. It is his impression that increasing litigation, plus the depression in business, combined with increasing compensation benefits under our act, inability to get work, all combine to make the burden increasingly hard when the insurer has to *prove* to the department of accidents that the claimant is no longer disabled. The increasing number of cases of subjective complaints, in the absence of adequate objective findings, comprising the so-called "neuroses", is very evident. This is a development along expensive lines. It is often fostered by the legal advisers of the claimants, who are becoming experts in compensation cases. Such cases of increasing disabilities are very difficult to contend with, and usually such cases require closure with lump sums. Clearly, the medical profession has made wonderful advances in the last decade, and yet we must admit the disability periods are increasing.

One phase of treatment, however, is open to criticism and that is physiotherapy. This had a great vogue after the war and it also was exploited by the commercial houses. I am the first to admit its proper value, but I do feel that it is greatly overdone. After a reasonable amount of it in a given case, use at work would be the best physiotherapy in the world, but this requires cooperation both from the injured and from his employer, and right there we meet resistance. From that point on, absence from real work and continuance of physiotherapy are really harmful. They get no more real physical results than time itself would offer in the average case. The claimant gets in the habit of calling at frequent intervals for his "treatment" and the idea often becomes fixed in his mind that he really is unable to get back to work. To repeat, these procedures done so routinely often in themselves prolong the disabilities. The common excuse given for their use is that if the insurer does not give them they will be given outside, and that it is a lesser evil to do it ourselves, keeping the case under observation and expense control. My point is that if an injured workman returned to work at the proper time, without such expensive physiotherapy, he would have the equivalent of physiotherapy for weeks and would be better off. Surely, we have all seen cases where men, industrial-accident cases or not, have resumed activities early and have been all the better for it.

Just as too prolonged disuse affects the local result in the fracture case, just so does too prolonged general disuse of the mind and body from work impair the patient's general status. The "patient" ceases gradually from being a "patient", slowly but surely becoming a "claimant." Early use of the injured part is consistent with good

¹ These are perhaps the most important. The present industrial and economic situations do not afford ideal opportunities for rehabilitation of such cases.

surgical opinion. Such voluntary inhibition on the part of the injured workmen, such refusal to return to work until *all* symptoms are over, is a serious problem. The experience of injured workmen in self-insured plants (such as the report of Dr. Clark in the Norton Co. in Massachusetts) shows an average disability in all fracture cases of 38 days and an average cost of \$101. These, of course, are not end-result cases, but cases where men have returned to work at special jobs as partial-disability cases.

This study is most important from quite another aspect. The compensation acts have created one of the largest units of socialized medicine. At times doctors have been criticized for profiteering or for prolonging disabilities, but the facts prove that the prime factor is the patient himself. The benefits to the injured workmen have steadily increased so that now we are commonly faced with cases where the compensation will equal the wage. To go further, outside benefits from health or accident policies may actually exceed the wage. Surely, these factors render the date of return to work increasingly remote.

A tendency of the act to study contributory disease, either as it affects or is affected by a given accident, is also on the increase. The widening scope of the act thus in itself tends to prolong some disabilities.

We have noted the fact that the disabilities in fracture cases in workmen are increasing. We have also commented on certain collateral factors of a nonmedical nature that contribute to this, namely, social, legal, the "psychology" of the dole, the broadened scope of the act, etc. This is in *spite* of increasing medical skill. "A well organized" medical movement to counteract this trend is found in the American College of Surgeons, which has a committee on traumatic surgery. Its work is very important and its studies cover the following subjects:

1. *Type of surgeons in traumatic work*, noting the development of clinics operated by the insurer, such as our large clinic in Boston equipped with all modern facilities—X-ray, etc.

2. *Need of more consultations* in industrial work, with education of the general practitioner in this regard, avoiding any interference with his relation to the patient.

3. *Surgeon's fees*, noting the overuse of X-rays in private cases at times by nonexperts.

4. *Failure of insurance companies to get good surgery* is remedied in large part, but at times retarded by "free choice" of physicians. Further improvements could be had with improved consulting services.

5. *Use of proper hospitals and proper use of hospitals.*

6. *Physiotherapy*, as now rendered, "of little value". Helpful in selected cases and then only while showing real benefit; otherwise, a detriment, with the patient doing less and less himself, becoming a "repeater", getting only temporary comfort and becoming a psychological as well as an anatomic patient.

7. *Free choice of physician* regulated by law. In Massachusetts under the act free choice exists.

8. *Increasing use of "aggravation" theory*, as well as the probably overdone speculative theory of "lowered resistance," a serious development and very overdone, both by lawyers and doctors but unfortunately not a measurable factor.

9. *Increasing scope of compensation acts.*

10. *Education of medical profession in compensation work*, noting the need of instruction in medical schools about the act, need of records, legal phases, rights, duties, etc. There has been a disinclination on the part of many good doctors to interest themselves in compensation cases. The medical phases of the act are highly specialized.

The American College of Surgeons recommends that all hospitals treating traumatic cases be approved by this college. The doctor should be experienced in traumatic surgery, accurate records must be kept, and the end results must be available for study.

In an article by Dr. Roscoe Gray, of the Ætna Life Insurance Co. (*Journal of Bone and Joint Surgery*, January 1928), read before the American Orthopedic Association, he concludes that "the surgeon trained in fracture work produces better results in serious fractures, but less efficient results in minor fractures, as contrasted with the general surgeon." Also, he proves that the added cost incurred by the trained fracture expert is compensated by decreased disability; this is not true in the minor fractures where the specialist is more expensive and longer disabilities result. This study was made from 34,753 reported accidents in California. Three subdivisions were made of the fracture cases out of this group, as follows: (1) The San Francisco cases, where specialists treated the serious fractures; (2) other cities in California where good general surgeons were used; (3) towns where the general practitioner was in charge.

Due allowance was made for cases where, because of consultations or transfer, a case would be controlled by more than one type of doctor. The study goes from the year 1917 through 1926. It is to be realized that the specialist will get the *worst* cases. Also, his expenses will be higher as he is more trained to use accessory methods of study (focal infections, etc.), and he will use X-rays more freely, thus increasing consultations, laboratory, and hospital costs. Also, with his patient away from home, neurotic tendencies may be intensified. The question then resolves itself into the justification of the use of the specialist. Clearly, to transfer every patient away from his family doctor would be foolish, but to transfer none would be illogical. This tabulation was made in an effort to find which types of fractures warrant such transfer.

A fractured femur, obviously a major injury, means hospitalized special care. The disability average in this study is 54 weeks, \$1,148 in compensation, plus \$795 medical expense—in all about \$2,000. As might be predicted, the rural disability was three times the city disability. Also the country disability was 12 times greater when the case was referred after a 2 weeks' period. Therefore, such a case should be referred immediately.

In minor fractures, however, the specialist makes a poorer showing than the general surgeon. In fact the country doctor was the most efficient. The probable reason is that the specialist is trained to be cautious, to expect trouble, he rarely sees the so-called "minor cases," and he will be more conservative with such injuries. The specialist took 6 weeks for a fractured finger, the general surgeon 4 weeks—this is a difference of 50 percent in a common type of injury.

Fractures of the metatarsals and of the metacarpals are best treated by trained men. The possibilities of disturbances in the mechanics of the feet or hands warrant careful treatment. The figures, however,

show no particular difference in the disability periods or of the cost when treated by any of the three groups.

With open operations of fractures, as could be expected, the disabilities were worse in the country group. Such work should be limited to experienced operators and not done by the occasional operator. These statistics, however, show that one-third of these cases were done by the country group.

In a group of fractures of intermediate severity, such as the radius and ulna, we find all three groups of doctors treating them, depending upon the apparent severity of the individual case. With the radius and ulna combined, the general surgeon showed as good results as the specialist. In fact the general surgeon got his cases back to work more quickly. Furthermore, the country surgeon got as good results with about one-half the medical cost. In a general way, this is true of the "intermediate" type of fracture—the specialist does not reduce the disability in the long run, but he does increase the cost. This is explained by the fact that the general practitioner is closer to his patient. He can get him back to the job more quickly; he will minimize the neurotic tendencies; his expense will average lower, as he will not have the costs that the specialist will have. A corollary, as might be found in any case where two groups of people approach the same problem from two different directions, is that each group may go too far. The general practitioner should use more of the accessories, especially in his serious cases, and the specialist should dispense with some of his costs, especially in the minor cases. Secondly, the general practitioner often permits too early return to work, with resulting recurrences, etc.; whereas the specialist pays too little attention to the date of return to work. The specialist's attention might be attracted to returning his patient to work at as early a date as is safe. The points to be emphasized again are the omission of needless treatment and loss of time from work.

This California study also shows that a good anatomic result obtained from a specialist may cause a longer disability than a good functional result obtained by a rural general practitioner. Psychology may outweigh surgery. The injured workman treated in his own community by his own doctor often gets back to work more quickly than the injured city workman, perhaps a stranger in a strange hospital, even though in the city he will get better surgery as such. The disability from the earlier return to work with perhaps a poorer anatomic result is compensated, however, by the earlier occupational use of the injured part.

To recapitulate, we agree that the disability periods in fracture cases are increasing, due to nonmedical factors. Fracture disabilities represent a fair index of the general trend, and the same study of disabilities after head injuries and back sprains would show the same increasing disabilities.

In conclusion, may I describe what we are doing in our Boston clinic? This is well equipped in all details. Each case is completely studied from the X-ray standpoint by consultations when needed, and physiotherapy supervised to prevent abuse from overuse of this method of treatment. Rehabilitation at suitable early work, of course, is a hard problem during the industrial depression, but such placements are constantly attempted. Fresh fracture cases, even of a

minor character, are hospitalized. We try to see all fracture cases and to cooperate in their treatment with the patient's own doctor.

In cases where a neurosis is anticipated an early financial settlement, if possible, is advised. The standards of the American College of Surgeons relative to treatment, etc., are maintained. Operative measures which might be considered in private nonindustrial cases, such as fusion operations, are avoided as much as possible. Such operations demand cooperation from the patient to a degree not satisfactorily present in the average compensation patient. These patients often want, not treatment to a point where disability ceases, but 100 percent restitution of the injured part, which may not always be possible. Therefore, attention to even minute complaints and small details in handling such patients is required, even at the expense of "overtreatment." This is warranted by the results of our work before the Department of Industrial Accidents of Massachusetts, where in the last analysis the disability periods in the major cases will be checked off. A reputation for an unbiased, honest medical opinion as to the ability to resume work by a patient is of invaluable aid in this regard. It outweighs much of whatever else may be presented by the claimant. This confidence in our statements to the Department of Industrial Accidents of Massachusetts exists on the part of the board members, and I stress it as being very important in cutting down excessive disability claims.

I do not presume to discuss the technical methods employed in treatment of these cases, as they are well known, both here and abroad, but I do submit some publications of the American College of Surgeons which may prove valuable.

Massachusetts workmen's compensation statistics, Department of Industrial Accidents—Fracture of upper and lower extremities for period of 10 years between July 1, 1922, and June 30, 1932

[Department work year extends from July 1 to June 30]

Extremities	Total cases	Deaths	Permanent total disabilities	Permanent partial disabilities	Number of cases, temporary disabilities										Total
					1 to 3 days	4 to 7 days	1 to 2 weeks	2 to 4 weeks	4 to 8 weeks	8 to 13 weeks	13 to 26 weeks	26 to 52 weeks	Over 1 year		
1922															
Upper.....	1,672	2	0	33	59	85	240	639	351	196	57	1	1,661		
Lower.....	1,301	11	11	16	48	53	200	362	236	234	128	2	1,279		
Total.....	2,973	13	20	49	107	138	440	1,001	587	430	185	3	2,940		
Percentage.....										14.6	6.3	0.102			
1923															
Upper.....	1,925	8	1	45	101	111	271	709	387	236	52	4	1,916		
Lower.....	1,863	11	6	22	73	106	319	482	353	375	108	8	1,840		
Total.....	3,788	19	7	67	174	217	590	1,191	740	611	160	12	3,762		
Percentage.....										16.2	4.5	0.3			
1924															
Upper.....	1,739	2	5	31	81	95	277	637	362	171	74	4	1,732		
Lower.....	1,791	15	13	9	67	97	269	515	304	260	149	2	1,672		
Total.....	3,440	17	18	40	148	192	546	1,152	666	431	223	6	3,404		
Percentage.....										12.3	6.5	0.17			

CAUSE OF INCREASING DISABILITIES IN FRACTURE CASES 151

Massachusetts workmen's compensation statistics, Department of Industrial Accidents—Fracture of upper and lower extremities for period of 10 years between July 1, 1922, and June 30, 1932—Continued

Extremities	Total cases	Deaths	Permanent total disabilities	Permanent partial disabilities	Number of cases, temporary disabilities										Total
					1 to 3 days	4 to 7 days	1 to 2 weeks	2 to 4 weeks	4 to 8 weeks	8 to 13 weeks	13 to 26 weeks	26 to 52 weeks	Over 1 year		
1925															
Upper.....	1,652	8		2	28	69	92	287	618	293	179	74		2	1,642
Lower.....	1,631	11		2	4	54	106	265	506	270	258	141		14	1,618
Total..	3,283	19		4	32	123	198	552	1,124	563	437	215		16	3,260
Percentage..				0.1							13.4	6.5		0.49	
1926															
Upper.....	1,691	6		9	26	82	86	268	718	279	156	53		8	1,676
Lower.....	1,552	7		14	19	61	63	247	480	279	234	129		19	1,531
Total..	3,243	13		23	45	143	149	515	1,198	558	390	182		27	3,207
Percentage..				0.7							12.1	5.6		0.84	
1927															
Upper.....	1,730	3	1	6	40	88	98	278	660	305	170	74		16	1,729
Lower.....	1,726	12	1	14	22	79	88	303	550	265	229	135		27	1,698
Total..	3,456	15	2	20	62	167	186	581	1,210	570	399	209		43	3,427
Percentage..				0.6							11.6	6.0		1.23	
1928															
Upper.....	1,669	2		27	22	47	69	266	644	322	163	87		20	1,640
Lower.....	1,781	12		31	20	60	91	287	562	310	233	139		36	1,738
Total..	3,450	14		58	42	107	160	553	1,206	632	396	226		56	3,378
Percentage..				1.7							11.7	6.7		1.65	
1929															
Upper.....	1,794	4		17	23	76	86	261	690	330	185	103		19	1,773
Lower.....	1,918	15		27	28	82	97	307	596	289	267	147		63	1,876
Total..	3,712	19		44	51	158	183	568	1,286	619	452	250		82	3,649
Percentage..				1.1							12.3	6.9		2.27	
1930															
Upper.....	1,919	1		13	28	59	71	264	758	378	223	102		22	1,905
Lower.....	2,068	13	2	18	29	79	110	313	623	346	279	186		68	2,033
Total..	3,985	14	2	31	57	138	181	577	1,381	724	502	288		90	3,938
Percentage..				0.8							12.7	7.9		2.53	
1931															
Upper.....	1,572	1		19	22	35	68	211	615	295	175	110		12	1,562
Lower.....	1,696	13		32	21	53	82	231	516	290	212	177		69	1,651
Total..	3,268	14		51	43	88	150	442	1,131	585	387	296		81	3,203
Percentage..				1.6							12.0	9.2		2.52	
1932															
Upper.....	1,333		1	14	14	43	31	180	519	264	146	104		17	1,318
Lower.....	1,410	7		29	12	44	47	189	444	218	202	165		53	1,374
Total..	2,743	7	1	43	26	87	78	369	963	482	348	269		70	2,692
Percentage..				1.6							12.9	9.9		2.60	

Chairman SHORTELL. We shall now have discussion on this paper by Dr. George W. Morse, medical director, Liberty Mutual Insurance Co., Boston.

DISCUSSION

Dr. MORSE. We have heard a very interesting paper by Dr. Dolan which explains why the disability period in fracture cases is growing longer. He has covered the subject so well that there is little left to be said. When I first heard about the question, it immediately occurred to me that the cause must be other than medical. There is no doubt but that most of the increase, if not all, is due to the present industrial depression and unemployment situation, and I wonder if statistics would not show the same increase in length of disability in other types of injury. There is no question in my mind but that the treatment and care of fracture cases are vastly better than they were 20, 15, or 10 years ago.

The American College of Surgeons has done a great deal to improve the treatment of fracture cases and is carrying out a plan of teaching which has been very, very helpful and will continue to be so. Fracture clinics in teaching hospitals have been organized and all kinds of new apparatus have been devised and experimented with, and numerous surgeons and students have been instructed in the most modern methods of reducing and immobilizing fractures, using various forms of new splints, skeletal traction, Balkan frames, Steinman pins, etc., to an increasing extent, and many good results have been obtained. In my position as medical director of the Liberty Mutual Insurance Co., with which I have been associated 21 years, I have had occasion to come in contact with many fracture cases, examining some cases personally and reviewing hundreds of files containing all the data and reports of cases which are under treatment in various parts of the country. As a result of this experience, I believe I have a fair idea as to the trends of surgery in different sections of the United States, and these trends vary greatly. To be sure, the vast majority of cases brought to my attention are the most serious ones. Those which have gone wrong mean long and expensive periods of disability, not only to the patient but to the employer.

As a result of this experience, there are two or three situations that I would like to call to your attention. One of them is in regard to the X-rays. X-rays of all troublesome cases are sent on to the home office and these give very clear and concise pictures of the problems in hand. It is surprising to see how often X-ray men, in different sections of the country, differ as to diagnosis, and I have found that many times the diagnosis of fracture has been wrong, due to mistaken interpretation of the plate, and that a great deal of disability has been caused, not by the original accident or injury, but by too much treatment, which retards the recovery of the patient both mentally and physically. The most common misinterpretation of X-rays seem to be in relation to fractures of the spine, i. e., compression fractures and fractures of the transverse processes. I have seen simple contusions and muscle strains treated for months with plaster jackets, apparatus, belts, braces, etc., which should never have caused disability for more than a few weeks. The treatment in these cases was based on faulty X-ray diagnoses at the start.

Again, disability is often prolonged unnecessarily by some of the more modern methods of treatment. Each of these new methods

has its value and is a great help in certain difficult cases, but the trouble is that when a new form of traction or apparatus is described in a medical journal or teaching clinic, many doctors in the smaller towns and often in the larger centers apply it to each and every fracture that comes under their care. As a result of this, I see many bad results and much permanent disability. Too much attention is paid to the fracture and not enough to the patient. These methods of holding fragments of bone in position by metal plates, pins, and wire traction should be used only in the exceptional case instead of as a routine. These forms of traction often, or usually, result in a good reduction of the fracture but frequently they cause infection of the bone (osteomyelitis) and often infection of the soft parts to such an extent as to cause permanent disability.

I have in mind now several cases where ankylosed knee joints have resulted from simple fractures of the femur in which infection followed the use of steel pins or tongs on the bone fragments, and I could see no reason why a more simple method of reduction should not have been used. Several cases of simple fracture have been made compound fractures, and I am sure that the patients would have made better recoveries if a simple plaster cast had been used for immobilization. Most of the new forms of traction have caused prolonged disability by reason of the fact that the patient has to remain in bed. As to workmen who are actively engaged at hard work every day, it is a serious matter to keep them in bed for several weeks, and I firmly believe that the sooner they get up and about on crutches the more rapid their convalescence.

The best rule to follow in fracture cases is to get the fragments in good position at the outset and hold them then with the simplest apparatus possible. The complications and nonunions result from improper reduction during the first few days. Compound fractures, where the bone punctures the skin, are not now so serious as heretofore if immediate good surgery can be obtained. Cases of compound fracture, when treated early and by an experienced surgeon, usually heal as well as, if not better, than simple fractures. Those that go wrong, become infected, and result in nonunion, usually are cases which have occurred on big construction projects, far away from a medical center. I feel that fracture cases under such conditions should be sent at once to a first-class surgical hospital regardless of the expense and trouble involved. An intelligent debridement or cutting away of all damaged tissue by a well-trained surgeon, followed by good reduction and fixation, will in almost every instance prevent permanent disability and shorten the convalescence. Most of the permanent disability cases which come to my attention are those which did not reach the well-trained surgeon and well-equipped hospital until they were already complicated with nonunion and infection and then only a partial restoration could be accomplished.

Another type of fracture which is often overtreated is the so-called "compression fracture of the spine and fracture of the transverse processes." I find that there is a growing tendency during the past few years to do fusion operations and bone grafts on the spine for all sorts of conditions, and as a general rule these operations do not work out well, in some cases because the operation was never indicated, and,

in part, because of the long period of idleness and the rather serious psychological effect on the patient. I believe that fusion and bone grafts on the spine should be done only where the series of X-rays show increasing deformity or in cases where the diagnosis is made as certain as possible by consultation. At the same time the age, general condition, and occupation of the patient should be considered.

Fractures into or near joints, especially in elderly people, always mean more or less permanent disability, and in these cases, when end results are reached, lump-sum settlements on a percentage basis seem to be the fairest method of closing them.

There is no question but that physiotherapy is being greatly overdone, and I think that at least 75 percent could be dispensed with without prolonging the period of disability. Too much physiotherapy is given for the psychological effect, and thousands of dollars are spent each year in trying to obtain motion in joints which were perfectly stiff at the start and always will be. Some form of work that the patient could do would help more than baking for 20 minutes twice a week. The mental and physical effect of doing some work every day would be a far better method of treatment. The fault here does not lie entirely with the doctor but with the patient or, perhaps, claimant. He says he cannot work; he insists he is entitled to treatment and there is no other treatment that can be given except to send him for physiotherapy. Once he gets started on this, it is difficult to find a reason for stopping it as long as he maintains that he is not able to return to work. Work he could do in spite of his partial disability would be more helpful in every way.

One of the greatest advances in the treatment of fractures which has been made in recent years is a splint devised by Dr. Fay of Melrose and an improved method of taking X-rays of these fractured hips which has been worked out by Dr. George, and I do not feel that I should talk about fractures without mentioning the excellent work which they will describe to you later.

Chairman SHORTELL. The next paper will be read by Dr. George, with a discussion by Dr. Fay. We will now have Dr. George.

Shortening the Period of Disability in Fractures of the Hip, Intracapsular Type

By ARIAL W. GEORGE, M. D., *Member American Roentgen Ray Society, American College of Radiology, and American Radium Society*

I am going to take just a few moments to read over some of the work that we have done on the treatment and study of intracapsular fracture of the hip joint, and I have left here for those who wish it a reprint of our recent study in the form of an article on this subject. Shortening the disability of that type of case, up to recently, has been a wish of all traumatic surgeons but not an accomplishment. Anyone who is familiar with the treatment of intracapsular hip fractures in elderly people, caused by slipping or tripping, or what we have come to speak of as a leverage type of fracture, in contrast to the other two classes which will be mentioned later, probably by Dr. Fay, knows that the end results of all forms of treatment have

been deplorable insofar as permanent or partial disability is concerned. This disability is practically the result of nonunion.

With our research on this problem of the last 5 years, in order to solve the mystery of nonunion, much valuable information has been derived, but from the past history of the treatment in no instance has there been any advance made to decrease nonunion or to increase the ability to function normally. A very careful search of the world literature would seem to sum up the question of nonunion at around 70 percent. When you stop and think, either from a sentimental or an academic point of view, that today, in this country and in the world, the best a surgeon can do for these cases is only about 30 percent of reasonable cures, it is a very tragic situation, and in my own personal opinion an indictment of traumatic surgery.

Five years ago my associate and I determined to solve the question of nonunion, if possible. To sum up, without boring you with details, we found that various theories such as a secretion within the capsule, upon which various opinions have been advanced, have very little bearing upon the question of the lack of union. Of course, we are not considering cases of nonunion over a period of time. We are considering cases of immediate fracture and immediate care to prevent nonunion.

Various men have cooperated with us in this work; it was not entirely done by ourselves. Through all this experimental work, as was natural, certain facts became very evident. First, there was the research of the late Dr. Stevens. He claimed that in this type of fracture the fracture occurs and the fall follows. I will not go into the details of this research except to say that I definitely concur with this statement.

Carrying out the mechanics of reducing this fracture, certain facts were brought out which made it possible to reverse these mechanics, and in doing this we found that the neck of the femur could be returned, or replaced, to its normal position. Dr. Fay will demonstrate this to you. In conjunction with this study we developed a special holder for the film, called a curved cassette, which made it possible to study the vertical view, not commonly done up to this time.

Dr. Fay, who is here today, in my opinion has done more definitely practical work along these lines than any other man I know of in this country, and his results stand better than any, so far as I know. The outstanding feature of our study has been that we have definitely established beyond any reasonable question of doubt that nonunion comes from malposition of the fragments, other things being equal. And the converse of that statement is that, other things being equal, the complete anatomical apposition of the fragments and their being held in this position through convalescence will result in the percentage of bone union being greatly increased, and will approach the same level of good results as is found in other types of fractures.

DISCUSSION

Chairman SHORTELL. Several years ago, while coming from a meeting in Montreal, at which Dr. Joseph Fay was present, a discussion came up about intracapsular fractures of the femur. Instead

of just talking about the subject, Dr. Fay went to work on it, and I think he has done a fine job. I believe, as Dr. George says, that his results are far better than those in any group of cases done by any other man in the United States. I now call upon Dr. Fay to tell us about what he has done.

Dr. FAY. As in most other cases, medically and surgically, I think the end result of our treatment in this particular type of case depends upon the type of fracture we are fortunate enough to get. Roughly, there are two types. One type I classify as the fracture without displacement, and the other type the fracture with displacement. I think this is about the simplest classification we can make. The fractures without displacement are fractures without displacement because they cannot be displaced. They are usually found and take place in a neck, in which the neck leaves the shaft at a greater angle than usual. In other words, it is male rather than female type of neck.

The fracture line is, to my mind, the important thing. This has been fractured to demonstrate that particular type of fracture [illustrating with model]. You see here the line approaches the horizontal. Ordinarily, what takes place when the neck is fractured is displacement upward, and subsequent external rotation of the distal portion of the neck. In other words, you get that [illustrating] and this [demonstrating].

In this type the neck cannot be displaced forward; the distal portion of the neck cannot. The capsule is pressed down close to its insert at the glenoid rim. As a result, you cannot get displacement of the distal fragment forward. In order to get shortening, in order for the fragment to rise upward, you have to get sufficient displacement forward to get it away from the overlying fractured surface of the proximal fragment or the fractured surface of the head. That cannot be done in this type of fracture.

It has been known for a number of years that this type of fracture always gets bony union. It almost always gets bony union irrespective of whether or not you do much of anything for it; simply putting the case in bed with a sandbag for a limited length of time procures solid union.

We come now to the next type, which is a more common type. In this type the fracture line is usually more vertical. It occurs at the narrower portion of the neck. Promptly, when the neck is fractured, you get eversion or external rotation of the limb, of the distal fragment. That produces this [demonstrating]. There is nothing then to prevent the distal fragment from sliding upward, and the X-ray picture in these cases shows this external rotation of the limb, the fractured plane of the distal fragment at an angle of 45 degrees or more to the fractured surface of the proximal fragment. Not only that, but the posterior surface of the neck of the distal fragment lies against the raw surface of the proximal fragment.

Unlike bones in other portions of the body, there is no periosteum here to form callus. You cannot get union between this surface of the neck in the back and this fractured surface of the proximal fragment. They will not unite. Union must take place between this broken end and this broken end [demonstrating].

The reason for nonunion in these cases has in the past been attributed to various factors, such as the general condition of the patient, but principally to an interruption of the blood supply. Yet men have cut down on these fractures later when they failed to unite, and have found plenty of blood supply still remaining in the head. You get the same interruption of the blood supply in the first type of fracture which I showed, but nevertheless you always get union in it. As Leonard developed his cassette, and as I had very good luck with the first 8 or 10 cases of this type which I had while at the Melrose Hospital, we began to feel that probably there was some reason other than our particular skill for our good results. At first, I ascribed it to the fact that I put these people up in boots and spreaders. A short while later I realized that I was unconsciously getting good reductions, that were almost perfect. The proposition of reduction is, to my mind, the first essential point in the handling of the cases. Of course, in the first type there is practically no displacement. In this type you have this type of displacement. To reduce that, if you simply take the leg, abduct it so, and internally rotate it, in certain of the cases, it is true, you will get apposition of the fractured areas, particularly if the surgeon who is doing the pulling is particularly rugged. It is not true, however, in the general run of cases. I am quite certain that instead of producing this by these particular methods, we actually produce that [demonstrating].

I think I can demonstrate very well the method which I decided to use to overcome it. [At this point Dr. Fay placed a subject on the table and demonstrated.] Get your patient in that position. That means the posterior surface of the distal fragment is impinged on the fractured surface of the proximal flexion. Now you can bring it out this way and turn it, so, and unquestionably in certain of the cases you will have some reduction. If you are not very rugged on the pull, I think you can take advantage of the various levers to accomplish the result, and certainly you will accomplish it much more readily.

I simply take the knee and flex it so, using some extension upward. Then adduct it, so; then bring it down, so, using extension. If you can hold it there, without too much stress, you can almost make up your mind that you have the two bony surfaces apposed. I think we can illustrate that with the bone here; looking down from your direction we have this [demonstrating]. That is the position. When you flex this up so, you release this impinged portion here that is on the back when you adduct and it flies back into position. Then, as you adduct so, when you bring it out into abduction, it is locked there. We have found in all our recent cases, by checking up before and after reduction, that we have been able to get good apposition.

I will repeat that process. Just take the leg so, see, and lift it up on the underneath side. Now flex it to an angle of about 60 or 70 degrees, and adduct, bringing it inward, at the same time lifting. Then use internal rotation of the whole limb, at the same time using extension, bringing it down so [demonstrating].

The next question is a question of maintaining position. I personally have used the boots, with a spreader which I devised myself. I do not claim any particular benefit for the spreader. It is like

most of the mechanical gadgets in the hands of a man who makes them—no one knows what they will do and what they will not do. They are all right. To have everybody use them would get most of them in trouble. I simply use my own particular spreader.

In a good many of these cases you cannot go to work and put them up in the old-time double spica. They will not stand it; they are too old. It requires time, it requires ether, or at least some type of deep anesthesia, to get them into a satisfactory apparatus of that type. At the hospital out in Melrose, for the past few years, on intracapsular fractures of the femur, practically all of us have used the spreader method—boots and spreader method. It is most essential that your nursing corps be trained to handle these cases. Simply because you have gotten reduction does not necessarily mean you are going to maintain it, and even those cases that are put up in a spica will slip. I have seen that.

We use that. We keep them up approximately 10 weeks, depending on what the X-ray shows. If they seem to have union at that time, we take off their boots, keep them in bed, and when they can raise the heel we let them up.

These cases can be turned over, but they must be turned over with the help of two or three nurses. Three are better. They can be rocked out of position, despite what some men who have used the apparatus say—"Well, that is all you have got to do, just put them up with that, and you can do anything you want." That is not so. The essential thing after you have done the primary requisite—that is, reduction—is to have sufficient application to keep it there.

I have had altogether, I think, 24 cases. One is a doubtful result. That woman fell downstairs about 2 months after she went home. She apparently had a good union when she went home, and she refused to have it X-rayed again lest it be broken. Two other cases I have had, that I did not treat in Melrose, have been failures. They slipped despite the fact that we had good reduction. One other case treated in Melrose did get away from me, but I did not have charge of that one, and the woman was too active. She was not properly handled.

As to ages in these cases, we have had them vary anywhere from 56 to 90. The oldest case was 90. We did not have as perfect apposition as we usually get. I was going to attempt reduction again, but she developed a plug in the circulation of her sound leg. Her leg was dark and cold for 24 hours, and then the circulation resumed of itself. That was 2 years ago and she is still walking around and has solid union there.

I had a case of a neck fracture about 3 years ago. This woman was very ill at the time. She was handled by a perfectly good man, but handled at home. I think she got reduction. She had a bronchopneumonia and a cystitis, and there was a question of whether or not she was going to live. In any event, there was nonunion. Last spring she broke the other side. Fortunately for me it was one of the first types of fracture which I mentioned. I could not fail to get a good result, and she is walking around again all right now.

We had another case, who had had infantile paralysis when she was 2 years old, and she had a practically useless left leg. The right foot was likewise involved. She had a fracture of the neck

on the sound side. We got solid union with her. We recently had a check-up X-ray on her, and the union is perfectly solid. She is walking around. She is 84, I think. Our cases in general have been fairly old; their average has been higher than 70. As far as general condition as a factor in the nonunion in their cases is concerned, I have one case that had pernicious anemia, and she has union. We have had them ill and sick. I think there is this to say: If you get the fractures reduced, and get the patients up, they are going to be comfortable, much more comfortable than they will be if you simply pile sandbags around them.

They can use bedpans with fairly good comfort, once the fractures have been reduced and once they are held there. I really do not see any sense in wasting time for several days in doing a reduction.

In addition to that, I think if you have a fracture with displacement, you are bound to get shortening of the muscles of the buttocks, and it is going to make the internal rotation vastly harder than it was before. I do not think any of you would allow a transverse fracture of the shaft of the femur to stay unreduced any length of time, and I think it is just as essential in this type of fracture that you get apposition of the fragments at the earliest possible moment.

[Meeting adjourned.]

WEDNESDAY, SEPTEMBER 26—AFTERNOON SESSION

Chairman, FRANCIS D. DONOGHUE, M. D., Medical Adviser Massachusetts Department of Industrial Accidents and Chairman of Medical Committee, I. A. I. A. B. C.

Chairman DONOGHUE. The program for this afternoon has been arranged after conference with the medical directors of the various State boards so far as they have expressed themselves.

I am going to invite Dr. Andrew Cornwall, well known as one of our impartial examiners and one of the best orthopedic men in Boston, to preside over the first section of this meeting.

Dr. CORNWALL. The first speaker this afternoon is Dr. Joel E. Goldthwait, who will give us a paper on Low Back Strains and Their Treatment. Dr. Goldthwait is one of the deans of orthopedics, and is so well known that I do not need to give him all the titles that might be conferred upon him.

Low Back Strains and Their Treatment

By JOEL E. GOLDTHWAIT, M. D., *Assistant in Orthopedic Surgery, Harvard University Medical School*

The large majority of the cases of acute back injury represents definite sprains of the joints of the low back, the lumbosacral, with the joint above and the sacroiliac joints being the joints particularly involved.

The spinal joints to be considered are those formed by the articular processes. The injury to these joints may be the result of severe violence, or the result of relatively slight strain.

The primary cause of such conditions lies in the fact that the average individual today uses the body relaxed so that the lumbar spine is used with the bones in the position of extreme extension. This position means that the weight of the body is taken from the bodies of the vertebrae with the intervertebral disks and is carried on the spinous processes, or the tips of the articular processes.

With the pelvic joints in the relaxed position, the pelvis is tipped forward more than is normal so that the axis of the sacrum is more nearly horizontal than is normal. In this position the thrust of the weight of the spine and body above the pelvis comes upon the articular processes of the sacrum, the thrust tending to tip the sacrum and pelvis downward an increasing amount.

In these positions there is no natural margin of safety as motions are made or injuries received on the side of extension. The parts cannot yield in that direction so that if force is applied damage must occur. At times bony damage may result if the violence is severe enough, but usually the tear of the ligaments is the nature of the injury, the condition representing a typical sprain. Normally, when the body is used in its proper balance, the spine is used midway be-

tween the extreme of flexion and extension so that there is a generous margin of safety in the two positions as strains are received or injuries occur.

With such a sprain of the joints of the low back, if the individual is allowed to go about before the parts have healed, a chronic irritative process results, muscle spasm develops, and the chronic invalid is the ultimate result in many of the cases. Still further, since the damage commonly represents tear of the ligaments forming the joints between the articular processes, and since the articular processes are closely related to the foramina from which the nerve trunks leave the spine, the swelling and irritation naturally following the injury many times produce pressure upon or irritation of the nerve roots.

Strapping and braces of any kind attempting to keep the patient about with a definite sprain of these joints and with the usual fully extended position of the spine can accomplish nothing other than palliation.

The treatment naturally consists in flattening the lumbar spine so that the ultimate position in standing will be with the spine midway between full flexion and full extension. This naturally corrects the position of the pelvis, with the relief of the pelvic-joint strain, and gives the articular-process joints above a chance to heal. To accomplish this, bed treatment is almost necessary in the beginning, and this means the body horizontal, with special exercises and positions planned with the idea of stretching the common contractures and making it possible for the spine to be fully flexed without pain. Once this is accomplished, a suitable support, which makes the fixed point the pelvis, should be used until the parts have become adequately strong.

In such back injuries, since the common "industrial back" occurs in a strong, healthy type of man who has been in the habit of eating heavily, it is important during the inactive period that the diet be distinctly limited, that the action of the bowel be made much more free than is normal, that phosphate of soda or some such drug be used in order to make the kidney function more active, the idea being to increase the eliminative functions as well as to reduce the intake of heavy foods so that the natural tendency which exists in these cases for arthritic changes to result later can be lessened.

As soon as the acute symptoms have passed and it is possible for the individual to be up and about, special exercises should be used, with the idea of developing the muscles so that the ultimate instinctive position will be the ideal one. In such cases, also, since the mental part of the picture is a very real one, where the compensation comes in, it is important that the individual be returned to some form of occupation at the earliest possible moment, even though the brace is still being used, and even though at first there may be some soreness and pain. Confidence and optimism from scientific understanding mean much in handling such cases.

[Dr. Goldthwait illustrated his discussion of the subject by anatomical charts, enlarging informally upon some of the points in his paper.]

DISCUSSION

Dr. CORNWALL. We will next have a discussion of this paper by Dr. James Warren Sever, impartial examiner of the Department of Industrial Accidents of Massachusetts.

Dr. SEVER. Dr. Goldthwait's splendid idealism has been an inspiration to many men in developing practical workaday problems in relation to these conditions. On the other hand, if there was central control of these troublesome cases of back strain, and if the litigation possibilities could be eliminated, we could all better approach the problem in the spirit indicated by Dr. Goldthwait.

We must all admit that good and satisfactory posture, in an erect position, is an aid to physical and mental good health, and should be an aid in industrial occupations. Unfortunately, however, anatomically and physically, all individuals have their own normal, and to prescribe an ideal posture for different types of men under different conditions of work, especially adults who are no longer anatomically plastic, and expect them to maintain these ideal postural conditions while at work, is impossible.

On the other hand, pain in the back following industrial accidents is a frequent cause for idleness and a tremendous expense to the insurance companies. Diagnosis and treatment of these various back conditions are difficult and really only vaguely understood, because so far there has been no pathological evidence forthcoming as to the actual condition. Confusion in regard to diagnosis, or to the actual condition existing, is not uncommon and leads to frequent injustice and much waste.

Dr. Goldthwait states in his paper that the large majority of acute back injuries represent definite sprains of the joints of the low back, the lumbosacral or sacroiliac joints being the joints particularly involved.

In my experience, I have come rather to eliminate the sacroiliac joint as a frequent site of injury, and to classify more cases as being injuries to the lumbosacral joint or to the muscles and ligaments of the low back. I cannot quite see eye to eye with Dr. Goldthwait in relation to the pelvic tilt, although I believe it is a factor in some cases, but more particularly in women in the nonindustrial groups. Pelvic tilts, with the so-called "horizontal sacrum", at present are on the top wave of popularity. There is no acceptable standard of pelvic tilt so far as I know. It varies with each individual, is dependent on many factors, and there is no known way of measuring accurately the pelvic inclination in the erect position.

This was shown many years ago in studies by Dr. Reynolds and Dr. Lovett when they attempted to do this.

We should consider the spine, as a whole, as a flexible and mobile structure, instead of thinking of it as a rigid structure subject to very few ills. We realize that the spine has many joints, and although they have a small range of motion and are controlled and supported by muscles, they are subject in stress and strain to the same ills as joints such as the knee, shoulder, and elbow. They can be strained and they can be sprained, with or without tears or rupture of the muscles and ligaments. They are subject to infections and to arthritic changes due to increasing years and laborious occupations.

Many of these conditions cannot be interpreted or diagnosed by X-ray or by clinical examination. It is one thing to detect actual disease of the spinal column, and it is quite another to pronounce every persistent backache a disease or an anatomical maladjustment of the spine.

Dr. Goldthwait considers largely in his paper the question of anatomical malpositions of the articular processes, or the relation of the sacrum and pelvis to the lumbar spine, with the pelvic tilt causing the lumbar spine to be held in position of extreme extension. I think we are all willing to admit that this may be a mechanically weak position, but, on the other hand, it does not wholly answer the question in relation to the large number of individuals who are doing daily laborious work without the slightest trouble and yet who may have this condition.

Many of the back injuries that we see are due entirely to one single accident, resulting in disability, due to heavy lifting or constant strain. It does not seem reasonable to me to suppose that these come on because of a primary poor posture, although perhaps poor posture as a preexistent condition may so weaken the muscles and ligaments that they are not in a position to carry added and sudden thrusts.

I feel with Dr. Goldthwait that early and immediate treatment of even the simplest back strain in industry should be, as he suggests, by rest, by hyperextension, and by a minimum period of fixation, followed by exercises, physiotherapy, and possibly a suitable support for a temporary period.

Apart from the postural conditions, we see so many cases of these back injuries that have associated congenital defects of the spine that one often wonders whether or not the sacralized fifth lumbar vertebra, or a lack of fusion of the spinous process of the fifth lumbar vertebra, may or may not be a source of potential weakness, predisposing sometimes under the right condition to strains that otherwise might not occur.

Hypertrophic arthritis, of course, is largely a matter of increasing years, and is common in the backs of all individuals who do laborious work and are under constant strain. Hypertrophic spurs or adhesions may give way and result in a chronic and persistent backache.

The human body must always have a margin of safety, just the same as any other structure which is to be used efficiently, and if good posture creates a larger margin of safety, then I believe it is a good thing.

Pathologically, except in a few instances in these back cases, we do not know, and nobody knows, just exactly what has happened. It is impossible in many instances to make a differential diagnosis between ligamentous strain or tears, muscle strain or tears, and slips of the articular processes.

Theory and imagination are often keys by which many problems, besides those of medicine, are opened to further truth, but eventually the evidence must rest on pathology and anatomical defects, and not on theories.

Many years ago Charles Fayette Taylor, in speaking of back strain, or as he called it "spinal irritation", said, "It indicates no lesion, describes no pathological condition; it is vague, indefinite, and incom-

prehensible. Used as a pathological expression, it leads to the gravest errors of treatment, attended by continual failure."

Industry must always be content with the average, and not the perfectly postured, person.

Dr. CORNWALL. We will now listen to Dr. Herbert H. Howard on Kidney and Urinary Conditions Simulating Back Trouble.

Kidney and Urinary Conditions Simulating Back Trouble

By HERBERT H. HOWARD, M. D., F. A. C. S. Surgeon, *Boston City Hospital*

During the past 16 years I have had quite a number of cases referred to me for urological examination in which there has been a history of a back injury. This paper is a summary of the findings in these cases.

In the diseases of the kidney, backache can be caused by stones giving rise to infection in the pelvis of the kidney, sometimes leading to complete destruction of the kidney, various tumors of the kidney, and injuries to the kidney from trauma where there has not been a complete rupture.

Aberrant vessels which cross the ureter, usually at the junction of the pelvis with the ureter, may give rise to backache due to the constriction of the ureter from the vessel crossing over it and causing a damming back of the flow of urine from the kidney pelvis to the bladder.

I have never seen a case of renal tuberculosis in which the disease could be associated with a back injury. In these cases, the urinary symptoms are so pronounced and the pain in the back is so trivial that the patient seldom complains of backache with the exception of cases of renal tuberculosis associated with tuberculosis of the spine. On the other hand, these same diseases of the kidney may not give rise to any symptoms until very late in the disease. In every case where there has been an injury to the back and the symptoms continue over a much longer period of time than the type of injury would seem to warrant, I believe it is of the utmost importance to have a complete urological examination made.

The type of kidney lesion which usually causes the most pain referred to the lumbar region are those cases in which there is an obstruction along the course of the urinary tract, due either to stones, aberrant vessels, or growths. The unobstructive lesions, as a rule, cause very little pain. I have seen a number of cases of fractured spines, complicated by injuries to the kidney, in which there was long-continued pain and in which the patient has been treated with various orthopedic appliances, only to find out at a later date that the damaged kidney was the cause of long-continued disability rather than the injury to the spine. All of these cases have shown definite obstruction to the flow of urine from the renal pelvis to the bladder, and in some there has been stone formation which was not present at the time of the injury.

The examination of a single specimen of urine which is found to be negative does not by any means prove that there is not a definite lesion of the urinary tract present and these cases must all be care-

fully investigated by X-ray examination, cystoscopic examination, and in some cases a diagnosis can be made by intravenous urography, which is the injection of a solution into the veins which is excreted in the kidney pelvis, giving an opaque shadow to the X-ray. The backache caused by these conditions is usually unilateral but may at times be bilateral.

The two conditions found in the ureter, which is the drainage tube connecting the pelvis of the kidney with the urinary bladder, causing backaches are stones and strictures, either the congenital type of stricture or the acquired type due to scar tissue following operation on the ureter, usually for the removal of stones. The pain caused by the passage of a stone is not included in this subject, for that pain is an acute pain and severe enough to require morphia. The type of stone causing long-continued backache is the stone that obstructs the ureter so that the urine cannot pass from the kidney to the bladder as it normally should. This type of obstruction in many instances gives a dull pain in the low dorsal and lumbar region of the back and may, if the obstruction is severe enough, show a negative urine on examination. Red blood cells in the urine indicate, as a rule, a lesion in the urinary tract which should warrant a most careful examination and should cause the physician much more worry than the finding of pus cells in the urine.

Diseases of the prostate, in my opinion, cause pain referred to the back much more than diseases anywhere else in the genito-urinary system. The most common of these is the chronic prostatitis and vesiculitis, due in about 75 percent of the cases to the end result of an old gonorrhoeal infection; in the other 25 percent due to non-specific infections and malignant disease of the prostate. By non-specific infections, I mean those caused by focal infection elsewhere in the body, such as apical abscesses, infection of the tonsils, infection from carbuncles and furuncles, and infection from absorption in the gastro-intestinal tract. In the vast majority of these cases, especially those following gonorrhoeal infections, the backache comes on a long period of time after the original infection has taken place, especially in those cases which have been poorly treated. The majority of these cases show urines whose sediments are entirely negative. The diagnosis can only be made on careful rectal examination with massage of the prostate and vesicles and examination of the prostatic smear after massage. It may be necessary to examine the patient two or three times before satisfactory smears can be obtained. In about 90 percent of these cases the patient will deny ever having had a gonorrhoeal infection. This, however, after all, is not of any great importance for the treatment is the same whether the infection is specific or nonspecific, and the same routine should be carried out so far as trying to find other focal areas regardless whether or not the patient admits having had gonorrhoea.

I believe that gonorrhoeal infections of the prostate are the cause of a great many more infections of the sacro-iliac joint than some of the orthopedic men would lead us to believe and that it is the cause of the long-continued and repeated attacks of sacro-iliac pain. The infection usually involves only one sacro-iliac joint at a time but may involve both. It usually does involve both at some time in the course of the disease if the source of the infection has not been removed. If the prostate and vesicles are the cause of infection, it is surprising

to see how readily the condition clears up under treatment. The treatment, however, should continue over a long period of time, until repeated examinations of the prostatic smears show only rare pus cells. Acute gonorrhoeal infections often cause backache but the diagnosis is self-evident to the examining physician and this type of backache usually disappears after the acute onset of the disease has subsided.

DR. CORNWALL. The next paper will be entitled *Curing the Crippled Hand*, by Dr. William Edward Browne.

Curing the Crippled Hand

By WILLIAM EDWARD BROWNE, M. D., *Visiting Surgeon, Carney Hospital*

The title of this paper is *Curing the Crippled Hand*. I do not believe that, after a hand has been crippled, it can ever be cured, if by cured you mean restored to perfectly normal condition. If that is so, perhaps I should not say anything further except to show what we have tried to do in this part of this State, with some degree of success, in treating these crippled hands. It is well to bear in mind how the hand is made up—in a brief way, what its anatomy is—the power of the hand, and the various ways in which the hand works.

Perhaps the most important part of a workman's body is his hand. There are three groups of muscles which bend or flex the fingers, and if you bear in mind that there is only one muscle or one tendon which extends the fingers, then you can see how, in crippled hands or hands becoming crippled, the tendency is for a force three times as great in one direction as it is in another gradually to draw the hand down and cause it to become a so-called clawhand. That can be readily overcome with a proper splint, and for the last 10 years we have tried to make these splints, which have helped us in one way or another.

As I have said, there are three groups of flexor muscles. There are about three nerves—the median nerve, the ulnar nerve, and the extensor or musculospiral nerve. It should be a simple thing for every lay person, not to speak of members of the medical profession, to tell when a person has a real injury to an important nerve. If a person cannot, after cutting the thumb, bend the thumb over so it touches the base of the fifth finger, when the wound is in the ulnar area, the ulnar nerve, in all probability has been divided. An easy way to check up on that is to hold the fingers tightly together, so [illustrating], and snap one finger apart against the others. If those fingers when snapped apart stay apart, it shows that in all probability the ulnar nerve, which supplies the little muscles between the bones called the interossei muscles, has been injured. So often we see numbness in the little finger and one-half the ring finger, and that results from an injury to the sensory part of the ulnar nerve, because, as you know, that nerve has two functions, the power of motion and the power of sensation, one an efferent impulse and the other an afferent impulse. With these conditions I presume the visiting members of this association and others are familiar.

The radial or musculospiral nerve has to do with the extension of the fingers, and it is usually injured in fractures in the region of

the humerus, though it may be injured elsewhere. I have seen just one example of an injury to it in the forearm, and that put five muscles out of commission. All of the extension of the fingers is not carried out by the musculospiral or radial nerve. The extension of the fingers from that point [indicating], which is a right-angled flexion of the phalangeal joint forward, is carried out by two nerves, the median nerve and the ulnar nerve; and the radial nerve supplies, in a sensory way, the motion of the first and second finger.

In speaking of nerve injuries, we have a functional paralysis—perhaps not always a functional affair—in the application of a tourniquet, which results in pressure against the musculospiral nerve, with more or less damage to it. We have had a number of those with which we have had some degree of success.

I would not know how to begin talking about a septic hand. It might be simple to talk about preventing it, but you cannot always prevent it even with the best of care. If I were asked to say, in just a word or two, what to do if a hand was going to become septic, it would be to place the hand in a position which, if it ever becomes stiff, would be the position of its greatest physiological use. The position of greatest physiological use of the hand is in the position in which I am holding my hand now [illustrating].

If the hand is placed on a flat piece of splint, with the palmar surface pointing down like that, it cuts out 60 percent of the use of the hand, which is the thumb. If the thumb is placed in a position with the palmar surface approximately pointed toward the remainder of the hand, then you will always be able in some way to grasp an object, much better than you will with the best artificial hand ever made.

I want to say a word or two concerning contractures, and what we have been able to do with one or two examples—how to overcome contractures. I believe that where burns have affected any part of the hand, the individual may be restored to a working capacity in 97 percent of the cases, with a hand varying, in the power to use it, from 60 to 90 percent. Perhaps I can show you with a case here. [At this point Dr. Browne showed a young man's hand, explaining the case.] This young man was burned in an explosion. He received very good treatment from his own doctor in Plymouth County, where almost everyone does receive good treatment. His hands were badly burned so that there was ulceration in his hands; his doctor was good enough to let me see him. We suggested a splint made after this model here [indicating]—a splint made of aluminum. It takes 3 or 4 hours to make one. It is padded lightly with felt and then, after a little exercising of the fingers, the hand is placed under an anesthetic in a position so that the fingers may some day amount to something.

This young man is not a workmen's compensation case. Now what is there about his hand in its present so-called partially crippled condition which enables him, though not in a compensation category, to use his hand for some 15 or 16 weeks now, in shoveling, raking around the yard, and driving an automobile from Plymouth up here this afternoon so that he might show us his hand? I do not know. It may be the cooperation which the boy has given us. It may be the fact that he was not allowed to get into a rut and to feel, perhaps,

that nothing more could be done for him; and also that he was not worrying about his job, or wondering if he was going to get back to work. He was sure of his job; he was sure of his place.

The only treatment this boy had was to rest his hand on a properly prepared splint. I do not believe that daily dressings of septic hands are a necessity. I have not used a wet dressing on any septic hand, or any other hand, in 10 years' time. I do use a dry heat, and this little piece of wood, carved out of a block of wood, allows the hand to rest properly upon it in a position of real rest, and in a position where, if the hand does become stiff, with the thumb held over the end of the splint, he will have some sort of a useful hand. That is the only treatment this young man has had—to keep his hand clean, to rest it on a properly prepared splint, and to start exercising it early. His hand has never healed. He will never have normal hands, but right now he is able to get ready again to make his living.

The next case is that of a gentleman from New Hampshire who had been treated for some time by his doctor, who was good enough to send him to us. These two fingers were close together. [On request the man demonstrated how much he could move the fingers.] We removed from his abdomen a full thickness graft, which means the skin and only the skin—you will note that the skin is made up of five layers—and inserted it in the place of the contracture in the palm of his hand, taking away the checkrein which existed in some measure between the second and third fingers, and to a greater extent between the first, second, and third fingers.

I believe that in this type of hand you can do a great deal for individuals who have contractures and who are unable to use the fingers. [Dr. Browne here asked the man to close and open his fingers.] The scar on the abdomen is much like that of a hernia operation scar, except that it is spread out a little. We operated on this man last April. Now he drives his car down from Manchester, N. H. He is today a man willing to do something, but, I fear, hampered a little in his willingness to get back to work by, perhaps—I do not say definitely—failure of cooperation on the part of those who have the power to put him back to work.

The next case is that of a gentleman from Quincy. This man was operated upon 8 weeks ago. He had a temperature of 104 or 105 at the Quincy Hospital, where I was allowed to see him and where we worked on him. For a while the outlook was bad for his hand and his hand will never be a normal hand nor anything like a normal hand. If he has a 50 percent normal hand some day, I shall be happy about it. This is, perhaps, as important a case as we have to show the power of placing, at the beginning of overcoming a crippled hand, a wedge between the fingers in order that these most important joints in the hand, the metacarpal phalangeal joints, be kept apart. For if they are kept apart, then it is possible some day to bring them together, but if they are allowed to heal and to stiffen to position this way, it will never be possible to separate them and to give them any degree of flexion at all. This man cut his hand at work. It was sutured, and within 12 to 14 hours it became a very badly infected hand.

This lady is from England, and being from England she is not nervous, although she has had enough in her life to make her nervous.

In Nelson's book on surgery, third volume, on page 131, the last sentence in the second paragraph reads, "And the condition is a permanent one." That has to do with Volkmann's contracture.

As you know, Volkmann's contracture is due, perhaps, to a bandage, to a splint, or to a plaster of paris cast; I think in many instances it is due just to the individual who has certain abnormal blood vessels or abnormal muscle bundles, permitting, after injury, a diffusion of blood in the muscle bundles, causing the beautiful little muscles of the hand and forearm and the arm to become fibrous or scar tissue, so that they are entirely incapable of use. This lady had a Volkmann's contracture, and received a great deal of treatment for it.

[Dr. Browne here asked the lady how soon it had become discolored after injury, to which she replied "Two days." In response to another inquiry, she said the pain was "terrific."]

She says the pain was terrific, and I think that is important in understanding what goes on. She had various forms of anesthesia—*avertin*, which is an anesthetic introduced rectally; an analgesic was given her nine times in 2 months. Her hand was manipulated, and finally her doctor from Springfield was good enough to let us see it. She had a crippled hand; it was absolutely united, perfectly solid, and we are speaking, please bear in mind, of Volkmann's contracture.

I saw her the first day, and looked at her hand, and manipulated it, and she thanked me a lot for it. An hour later the Sister in that ward in the hospital said that the patient had gone home. The lady said she was not going to have anybody like me look after her hand, so she went home to Springfield. Then she came back, and she said, "You can treat my hand if you will treat it so."

We worked very hard on her hand, and after a while she worked with us. She had with this a little functional nervous trouble that might well have come from a shock she endured in early life. During the war high-explosive bombs in London scared her so that it was necessary to get her away from that country. That left an impression on her, and all of these things played their part in her troubles.

We lengthened the two midfingers, the third and the fourth, which were tied down, by taking out—she has a hernia of the wrist—the transverse carpal ligaments, and by doing away with the *palmaris longus* muscle, present in about 60 percent of all individuals, and using that tendon to lengthen the two tendons tied down; after that, and after a graft, we placed the whole hand on a properly prepared splint, then working with her hand and working endlessly with her. There were not many dressings and no physiotherapy. There was no sitting down, with someone in front of her working a little while on it, but about 3 minutes of work with a good deal of pain.

This hand was so badly crippled for a year that she could not use it; it is not normal now—it is never going to be normal—but it is in excellent condition compared with when we started work on it. This hand speaks for itself better than anything I can say.

[Dr. Browne had the patient demonstrate the movement of her fingers.]

There are 12 splints here, and I should be very glad to have any or all of you look at these splints at any time. I might say in con-

nection with splints that perhaps this one [holding up one] has served us very well. The hand is placed on a properly prepared splint where it looks comfortable to begin with. With the hand held in this position for a number of days, in metacarpal fractures or tendon injuries, then, without disturbing the metacarpal portion of the hand, by a simple removal of part of the splint, like this [illustrating], the patient can move his finger and start exercising these fingers, while the main portion of the hand is still held fixed and rigid. This splint has worked very well.

I might say in closing that I have gotten the greatest help from the medical adviser of our industrial accident board here who has given me ideas as to what to do with these hands, and that the members of our board have cooperated at all times in endeavoring to get people back to work after some of these difficult things we have tried to do for crippled hands.

Dr. CORNWALL. I should like now to introduce to you Dr. George A. Goslin, who will preside over the remainder of the meeting.

Dr. GOSLIN. We will now have the great pleasure of listening to Dr. Codman. Dr. Codman has written a fairly good-sized book on the shoulder, and any man who can write a whole book on the shoulder certainly must know something about it.

The Crippled Shoulder

By E. AMORY CODMAN, M. D., *Consulting Surgeon, Massachusetts General Hospital, and Impartial Examiner Department of Industrial Accidents of Massachusetts*

The Enormous Cost of Neglected Industrial Injuries

I have been in practice long enough (39 years) to be able to compare the fates of injured laborers before and since the introduction of workmen's compensation. Like most legislation, this act has had its good and bad results, and there is quite a list of each. On the good side is the care and attention these patients now receive, not only from doctors, but from the industrial accident boards. Formerly, these patients went to the out-patient departments of charitable hospitals and formed items in the experience of young internes. Now, they are sought for, in the first 2 weeks, by mature practitioners, who are sure of a moderate recompense. After 2 weeks they are largely treated by "industrial surgeons", whose accumulating experience makes them really "specialists" in the treatment of the common forms of injury. I do not question that the majority of injured workmen receive better treatment, but there is a minority of cases which may happen, in the first 2 weeks, to fall into the hands of practitioners who may do more harm than the average interne. This minority is a very expensive one.

When it comes to the chances of these employees receiving a just compensation for their loss of time or for incapacity, there is no comparison of "then" with "now." One need follow but one case through the Massachusetts Department of Industrial Accidents to realize what a long, expensive, detailed effort is made to analyze each case and to decide it, if possible, in favor of the injured em-

ployee. Certainly the employee is often given the benefit of a doubt. There may be hearing after hearing and the employment of many expensive medical experts in a single case.

As to the bad side—at least so much of the bad side as I believe may be eliminated—I should say that too much time, energy, and money are spent on diagnosis and expert treatment after the expiration of months or years, as compared to the time, energy, and money expended during the first 2 weeks after an injury. If the experts were employed early, when the golden opportunity is still present, instead of late, the patient, employer, insurer, and the community would be better off. The infinite pains and the courageous expense taken by the Massachusetts Department of Industrial Accidents to make sure that a case is hopeless, when that patient might have been well and at work within 2 months if he had been properly treated in the first 2 weeks after the injury, is always a source of admiration and yet of regret to me. Admiration for the thoroughness displayed by the board, and regret that the law provides that the physician who treats the case in the first 2 weeks shall be paid whether he makes good in his diagnosis and treatment or not. If the law provided that when he is uncertain of his competence to diagnose and treat the injury, he should call expert advice, without loss of his own fees, I believe all concerned would gain, for the first 2 weeks are the most important in most instances.

Leaving aside the question of failure of early treatment from negligence, or bad judgment, or lack of skill on the part of the first physician consulted, let me speak only of pardonable ignorance on his part, and what can be done to help him to avoid such errors.

No general practitioner can keep abreast of modern medical progress. He cannot afford the new books, even if he had time to read them. He cannot digest what he reads in the medical journals, even if he believes the statements of the author. I want to see an annual publication put, without charge, into the hands of every practitioner, which will give him an outline of every proved practical advance in surgery (and later also in medicine). If such a publication came from an authoritative source, such as the American College of Surgeons or the American Medical Association, it would demand attention from everybody concerned in the practice of medicine, from student to specialist. It should be edited with great care, and contain only those advances which have been verified by the experience, not only of the hospital where the advance originated, but by several or many others. It would necessarily be a few years behind the times, but at present the average practitioner is, necessarily, many more years behind. If he is too up to date, and tries everything that comes out in the journals, he may be positively dangerous.

Such a publication would offer to those practitioners who desire to keep up to date, within reason, a definite means to do so, for it would sift the countless articles which constantly appear in our medical journals, each of which contains more or less doubtful statements and claims, which later will be eliminated by general experience, after haphazard and unrecorded efforts to confirm them by experiments on the public at large.

The reason that Dr. Donoghue has asked me to speak to you is that he knows that I have just written a book as an argument for these

ideas, with the particular purpose of influencing the American College of Surgeons to edit such a publication. I plan to offer the following resolution at the coming meeting of the college:

Resolved 1. That the board of governors of the American College of Surgeons recommend for the consideration of the board of regents, the advisability of an annual issue of Surgery, Gynecology and Obstetrics, to be edited for the general practitioner, summarizing such recent advances in surgery as have been selected by a committee of the college from (a) lists submitted by each approved hospital, and (b) tested and confirmed by a sufficient number of other hospitals, and (c) discussed at an annual meeting of this association.

2. That the board of governors authorize the director-general to confer with associations representing industrial insurers, to seek their cooperation in financing and in distributing to every doctor in active practice such an annual issue of Surgery, Gynecology and Obstetrics.

3. That the first issue should appear not earlier than January 1937.

You may ask for an outline of the argument for which I have thought it necessary to write a 500-page book on the shoulder.

In the first place, to make my reasoning effective, I had to write the best book which has ever been written or which is likely to be written in the next decade on all the diseases and injuries of the shoulder. This was partly because I planned to use as an example of the enormous cost of neglected injuries a certain commonly unrecognized injury (a novelty of my own invention) which is so little known that no practitioner can at present be blamed for not recognizing it.

In order to use such a novelty, which is not yet generally conceded as an important injury, and by some I fear still considered a myth, I had to write a background to show that I was conversant with all other known diseases and injuries which might affect the shoulder. I might thus give my pet example its due proportion of importance, as a practical entity, which every doctor should know.

This lesion of the shoulder I discovered over 20 years ago, and as far as I can learn, a description of it had never before appeared in medical literature. It is a lesion which is particularly suitable for my purpose because the X-ray gives little indication of its existence. It has been so difficult to recognize that I have known well-trained industrial surgeons to fail to detect it, yet because I have been interested in the study of shoulder conditions I myself find it quite easy to diagnose most of the cases, although sometimes I am in doubt when the lesion is not extensive or is complicated by other injuries. It is not that I am so expert, but that I know of and look for the symptoms.

The name of this injury, which consists of a tear in one of the shoulder tendons close to its insertion in the bone, is rupture of the supraspinatus. To one unfamiliar with its signs the shoulder may appear normal. This injury is very incapacitating. Unless promptly operated upon successfully, it is the cause of permanent disability, so far as extensive use of the arm above the shoulder is concerned. I can say without hesitation that all of you who have been a year or more on industrial accident boards have seen cases of this kind, although possibly the term I have used was not applied to them, so that they came before you under some other name, such as peri-arthritis, arthritis, neuritis, or bursitis of the shoulder. These patients complain of pain and say they cannot raise their arms. Most of the shoulder injuries (which are not fractures) in men over 40 that come

before you 6 months or more after the accident, you will find to be instances of this lesion. This can be proved by very small, harmless exploratory incisions under local anaesthesia. (Dr. Francis D. Donoghue, of the Massachusetts Department of Industrial Accidents, on several occasions made this diagnosis.)

I find the utmost difficulty in teaching the general medical public what, for 20 years, I have thought I knew about this lesion. In the first place, doctors are not much interested in shoulder conditions, and they certainly do not know much about them, for even the terminology is so vague that a half a dozen names are often applied to a single case. There are no shoulder specialists. Even the orthopedic surgeon has only recently claimed responsibility for treating shoulder cases in most hospitals. I get little encouragement from insurers, because I testify at hearings of the Department of Industrial Accidents that I have made such a diagnosis, and believe the case to be one of permanent partial disability, in the face of the statements of the doctors who work for the insurer, and have not recognized the condition, who may claim that the man has arthritis or is a malingerer. The fact that the X-ray shows little to help in the diagnosis is very unfortunate for these patients, yet it makes this lesion very appropriate for my argument because no real blame can be attached to any practitioner who fails to recognize it. In almost all cases an X-ray is taken, and since no fracture is shown, the doctor is content to treat the patient for a strain with whatever form of therapeutic apparatus has been sold to him. In reality the injury is of more importance than most fractures in the bones of the shoulder, and means permanent partial disability as a rule.

Another reason why I find it difficult to diffuse my ideas about this lesion is that I am never able to get these cases within a few days of their injury. Even the insurer's examining physician seldom sees them until weeks have elapsed. Instances are too uncommon for any one practitioner to see more than a few of them; hence they are, one may say, always unrecognized for weeks, if not for months or years. Therefore, my operations in these cases have been performed at a great disadvantage, seldom before months have elapsed, and sometimes after years have elapsed. During this time shrinkage and atrophy of the tendons and other tissues occur so that the operative prospect is by no means good. Only about two-thirds of my operations in these protracted cases have been successful, and then only after tedious convalescences. Hence the great news does not run like wildfire through the profession as it does where discoveries are miraculous and newsy.

We may now turn to what should more distinctly come under the title of this paper, for although this injury is apparently a minor one, it costs as much as a major one; i. e., the full amount of compensation allowed by law. Under our Massachusetts statute this means \$4,500 in each case. Let us assume that \$1,500 is allowed for hospitalization, medical attention, and compensation for a prompt, early operation resulting in recovery and return to work in 6 months. Therefore failure of early recognition may cost \$3,000 in one case. I have arranged the following table of comparative costs, which indicates how important it is that this lesion should be recognized in its early stages. I hope you will not assume that I am narrow minded enough to think that this particular lesion which I was the

first to recognize is more important than any other lesion which may cause disability if neglected. I am merely using it as an instance; many surgeons make such additions to our common knowledge. The table of costs applies equally well to many other neglected injuries, which, if recognized and treated promptly, would have given little trouble. When we multiply by a figure followed by three zeros it is astonishing how fast the total rolls up.

Some Comparative Cases

The cost to industry of neglected cases of complete rupture of the supraspinatus tendon compared with certain other costs:

The cost of 1 case, \$3,000, is that of a very fine automobile.

The cost of 2 cases, \$6,000, equals the gross annual earnings of the average doctor.

The cost of 5 cases, \$15,000, would be a reasonable salary for a college president.

The cost of 6 cases, \$18,000, would publish one number of the *Journal of the American Medical Association* to inform every doctor in the United States about the subject (1932, \$17,287.62).

The cost of 10 cases, \$30,000, would distribute a (\$10) copy of this book to every hospital in the United States.

The cost of 63 cases, \$189,000, would pay the cost of the great out-patient department of the Massachusetts General Hospital which treated 310,334 patients in 1932 for \$188,722.61.

The cost of 67 cases, \$201,000, would pay the entire expenses of our American College of Surgeons for 1933 (\$198,945.57).

The cost of 90 cases, \$270,000, would pay the cost of the Harvard School of Public Health for 1932-33 (\$240,357.85).

The cost of 360 cases, \$1,080,000 would cover the cost of the entire Harvard Medical School for 1932-33 (\$1,076,990.75).

The cost of 600 cases, \$1,800,000, would cover the costs of the entire Massachusetts General Hospital, including those of the Phillips House and of the Baker Memorial, 1932 (\$1,671,211.80); or the entire cost of the great American Medical Association, 1932 (\$1,510,447.36).

The author estimates that at least 1,000 of these injuries, most of which are not recognized as such, are being paid compensation at present in the United States, and that early diagnosis and prompt operation might have saved the major portion of the expense thus incurred. This lesion is only one among many, which, when neglected, may cost as much. The total avoidable expense would form a very large fraction of the \$131,000,000 which industry annually pays for compensation.

That the cost of 63 such injuries is greater than the cost of treating more than 300,000 patients annually in the Massachusetts General Hospital out-patient department, or in any similar clinic, indicates how expensive inadequate treatment may be. Although we deal daily in money values, this thought is staggering. Why do we ignore it? Habit has so closed our minds that we cannot face such facts. Laymen, even though they are hospital trustees or insurance directors, still venerate the doctor "who freely gives his services", and turn from any consideration of his efficiency. Perhaps medical charity is a greater community expense than we have realized and hospitals

might save money by paying their doctors if the costs of two neglected cases equal the average physician's earnings for a year!

If we did save industry such costs, would it contribute any of this ghostlike money, which it would have spent but did not, for any of the above cost equivalents? Would the doctor who made an early diagnosis be given even a second-hand car? It is unlikely that any of the institutions mentioned would receive even a fraction of this money, with the possible exception of the suggested annual number of an authoritative journal. Even if industry is willing to contribute for this purpose, we must admit that as yet we have no system of testing alleged improvements to make sure that they really are advances.

If the "end-result system of organization" existed in our hospitals, all failures to obtain good results, whether they did or did not cause economic loss, would be constantly picked up, their causes analyzed, and study given to prevent similar failures in the future. As soon as adequate treatment was discovered for any particular class of case, it would be automatically advertised to the general practitioner, with or even without the aid of authoritative journals.

Dr. GOSLIN. We are now going to have the great pleasure of hearing from Dr. Cadis Phipps.

Dr. PHIPPS. I, too, like Dr. Codman, have a plea to make, but I am sorry that it is nowhere near as tangible, and its object, rather than economic, is what might be called "medical." I am going to offer a few figures, with the accent on the few. They are not to be offered, though, in any way from a statistical point of view, but more to serve as an illustration or background for making my plea. My plea is this, that we should employ more functional tests when we are examining men—workmen or ordinary patients—in regard to heart disease. We are especially interested, not in what sort of a murmur, what sort of an irregularity, the heart shows, but what that heart can do. We all realize that there is one possibility of mistake, and that is, when we have a patient sitting in front of us, of listening to his heart and hearing nothing at all abnormal, passing him and saying that he is absolutely fit to go on with his work, and then hearing that under stress and strain his heart, because of some unseen, unnoticed difficulty, broke down. Unfortunately, this is fairly common. Then, too, we have the other extreme. That has occurred to a person with a very definitely damaged heart whom we have confined to practically a life of invalidism, but who, if we had exercised him, not only could carry on his work, but would undoubtedly be benefited by it. In order to illustrate that, I am going to quote a very few figures.

The Effect of Work on the Diseased Heart

By CADIS PHIPPS, M. D., *Professor of Medicine, Tufts College Medical School, Impartial Examiner, Department of Industrial Accidents of Massachusetts*

According to the classification accepted by the American Heart Association there are 14 general causes of heart disease (or 15 if we include the last one entitled "unknown etiology"). I believe this may be simplified, for our purposes, under three major head-

ings—infectious, toxic, and mechanical. By “infectious” I mean heart disease caused by such conditions as rheumatic fever, syphilis, etc., which are obviously not related to industry. The heart may be injured functionally, and perhaps structurally, by a variety of toxins, either arising within the body from disturbances of metabolism or elimination, or externally from the effects of poisons, and within this second group we find a limited number of cases related to industry, namely, where there has been exposure to such chemicals as lead, mercury, phosphorus, carbon monoxide, benzol, etc. It is the third, or “mechanical”, etiological factor that we shall consider here.

In discussing what I have called a mechanical etiology, I do not refer to a sudden severe strain or blow on the chest wall (or trauma) as a cause of heart disease, although it is listed as number 14 in the classification referred to above, because I believe from a review of cases examined impartially for the Department of Industrial Accidents of Massachusetts, as well as from my study of cases as a visiting physician at the Boston City Hospital, that it never causes cardiac damage, except to an already diseased heart. I refer rather to the cardio-dystrophies, such as arteriosclerotic heart disease and hypertensive heart disease, where it would seem that physical exertion might be an important factor, when we consider not only the effect it has in raising blood pressure, but also the almost direct action exertion may have in increasing the degree of atheroma existing in the arm or leg the workman uses most vigorously, compared with the other arm or leg. This apparent causal relationship is not so definite when we consider the incidence of hypertensive heart disease among people not engaged in physical work, and the fact that arteriosclerotic heart disease, or myocardosis, is more particularly associated with individuals leading a sedentary life.

We have, however, a means of investigating the effect of exertion on the normal heart in the studies made of the so-called “athlete’s heart”, about which so many erroneous ideas are prevalent. The well-trained athlete has a slow pulse rate and low blood pressure, which are due to cardiac hypertrophy, resulting in a greater systolic output with less expenditure of energy. This hypertrophy, however, must be considered in connection with the hyperdevelopment of the athlete’s skeletal muscles, as well as his total weight, size of chest, etc. We must make a distinction between what may be called a physiological hypertrophy due to exercise, and the pathological hypertrophy which is compensatory or due to toxic stimulation from some underlying disease, such as rheumatic fever. Two years ago I studied the effect of cross-country races upon Harvard runners, examining their hearts both clinically and with an electro-cardiograph directly before and again just at the completion of the race. My results were uniformly indicative of the absence of any harmful effect on the heart itself. The electro-cardiograms illustrated the mechanism of the so-called “second wind”, namely, the shortening of the diastolic period coincident with the rise of the pulse rate, but with no effect on the duration of the systolic phase unless there were collapse. The cases of collapse incident to college athletics are rarely, if ever, attributable to heart failure, providing, of course, that the athlete has no underlying heart pathology, but are due rather

to general fatigue, occasionally to effort syndrome, and to other conditions, none of which should cause any structural change in the heart itself. Incidentally, I will mention, in passing, the rare cases of real cardiac collapse or acute myocardial fatigue which has been explained as consisting in spasm or an acute cardiac contracture by Hirshfelder, and is illustrated by X-ray films taken by Dr. T. K. Richards at Soldiers Field, rather than being due to an acute dilatation of the heart, which is the commonly accepted view. The symptoms arising from the so-called "athlete's heart", moreover, usually present themselves during the period of readjustment, after the athlete has left college and has ceased most of his athletic activities.

The effect of physical exertion on the already diseased heart comprises almost limitless possibilities of danger, ranging from slight increase of functional disability to actual sudden death. Nevertheless, this does not mean that all exercise is harmful in all cases, and while in medicine we must be guided by certain general principles, we should not let them blind us to less common, but still possible, results in our management of the individual case. We are prone at times, following the line of least resistance, to prescribe the usual, whereas in certain instances the unusual or less obvious therapy may be indicated. While rest is, and always will be, the chief means of benefiting the sick heart, yet the following table of figures may serve to point out certain exceptions to this rule. I must add, however, that I am not offering these figures for their purely statistical value, for these workmen were referred for examination relative to some incapacity, cardiac or otherwise, and are not a cross-section of industrial disease or workers in general. Nevertheless, I feel that the figures do tend to modify our views of the relationship between cardiac disease and physical stress.

For consideration I have selected 500 cases from those examined, purposely omitting many, such as heart pathology related to hyperthyroidism, and those conditions of recent origin, such as acute rheumatic heart disease, etc. Roughly, 60 percent of these had been aggravated by their work and in practically all of these the aggravation was attributable to some sudden or unusual exertion. The other 40 percent I felt had no causal relationship to their occupation. The degree of incapacity has a direct bearing on our subject, and the following are my figures: Total incapacity, 19 percent; partial incapacity, 56 percent; no incapacity, 25 percent.

In grouping the different types of heart disease, I have confined myself to single diagnoses, for the sake of simplicity, trying to select the most important lesion.

Classification	Number of cases	Total incapacity	Partial incapacity	No incapacity
		Percent	Percent	Percent
Aortic regurgitation.....	19	16	31	53
Aortic stenosis.....	4	25	50	25
Mitral insufficiency.....	34	5	33	62
Mitral stenosis.....	142	14	69	17
Hypertensive heart disease.....	96	25	50	25
Arteriosclerotic heart disease.....	128	30	52	18
Congenital heart disease.....	2	1	1	0
Effort syndrome.....	54	0	34	66
Coronary thrombosis.....	21	38	62	0

In interpreting this classification I think it fair to state that I purposely allowed a generous margin of safety in my terms, "total, partial, and no incapacity." In other words, I considered the case one of total incapacity if there were any risk whatever in doing some physical work, and on the other hand, those whom I felt were without any incapacity were workers who were able to perform all the duties of their occupation without any cardiac symptoms or signs whatever, indicative of dysfunction or lessening of their cardiac reserve. My opinions were based not only on physical signs and a history but also upon electro-cardiographic examination which I made whenever I thought it of value, and even more important to my mind by functional tests by means of exercise. I want to call particular attention to some of the specific lesions in this group and their comparison with the same lesions occurring in individuals whom we commonly designate as "private patients."

Rheumatic mitral endocarditis with stenosis of the opening is, as you know, commonly a progressive lesion. The average age at death is 35 years. Incidentally, the average age of the patients in this group whom I examined was 39 years, but more interesting to me was the fact that 17 percent of them were continuing with their manual labor, and not only was there a complete absence of cardiac symptoms, but also it seemed as though their general health, not to mention their mental attitude, was distinctly improved by their continuing with their work. Looking over a group of what I have previously termed "private patients" I find that of those suffering from mitral stenosis, 10 percent is a liberal estimate of the number who had no incapacity whatever.

My figures in regard to hypertensive heart disease are rather arbitrary in respect to my classification of degrees of incapacity. If I had not been dealing with workmen where there was, naturally, a question of possible aggravation of symptoms from some unexpected happening, I feel sure that I would have considered more than 25 percent of them able to do their usual work and less than 50 percent of them even partially incapacitated. Cases which I have grouped under the term "effort syndrome" naturally include many borderline ones where apprehension or introspection was a large factor. My comment in regard to my figures there is that the 33 percent listed as "partially incapacitated" might well recover complete working ability if put back to work under careful supervision and with proper medical attention to contributory causes, such as focal infection, faulty hygiene, etc.

Perhaps the most interesting group to me consists in those men who had suffered from coronary thrombosis, most of them still showing evidence of myocardial damage on electro-cardiographic examination. While, of course, very few workmen suffering from coronary thrombosis are referred to me for an opinion (many of them dying as a result of the attack), and while the few data which I have gathered cannot in any way be considered of statistical value for this reason, nevertheless, there are certain factors to be noted in regard to those whom I have listed as "partially incapacitated." Most of those whom I saw came to me 3 months or more after their attack, and many of them I saw for the first time a year or two later, to pass

upon the question of their ability to do some work. Five of this group had been symptom-free and able to do light work for periods varying between 2 to 5 years and two of them (one had had an attack 5 years previously, and the other 2½ years previously) stated that they felt perfectly well, had no symptoms whatever on moderate exertion, and believed that they could do as much physical work as prior to the attack, except for the fact that they had been advised not to attempt it, and furthermore were "out of training."

In considering the advisability of men doing some physical work (and I purposely express it "advisability" rather than "possibility"), it may again be of help to compare these individuals with the same type of patients who are not engaged in manual labor. Not only do I believe it is common but also I consider it correct treatment to suggest for patients who have a mild degree of arteriosclerotic heart disease or hypertensive heart disease that they walk, play a little golf, or take short horseback rides if they are accustomed to this exercise, and in other words, encourage them to benefit their general condition and musculature, if they do it carefully and if all exercise is attempted gradually. Another example of this treatment, but here made more specifically a medical procedure, consists in the systems of cardiac exercises as devised by the Schott brothers, Oertels, Herz, and others. To be sure, manual labor is ordinarily more tiring, more exacting, and therefore more hazardous, but, on the other hand, it in a way offers the best means for a patient to continue an accustomed exercise, which is probably the chief factor in preventing dangerous strain upon the heart.

In conclusion I wish to remind you again that my figures are not offered as statistics to prove mathematically either the dangers or benefits of work, especially as they relate to a selected group of cases, namely, those where there was some question of the specific disability or its relationship to the man's occupation. Furthermore, in no way do I wish to belittle the importance of rest in the treatment of heart disease. On the other hand it has been my experience that frequently workmen are prevented from engaging in or continuing with physical work because of evidence of heart pathology, whereas actually their cardiac function might not in any way be injured by such work, and in fact in many instances would undoubtedly be improved because of the benefit to the man's general condition. I therefore present these figures as a plea for more careful consideration of the possible compatibility between physical labor and an abnormal heart, and more particularly as a plea for more painstaking and thoughtful examination of the workman, especially with the employment of functional tests, before condemning him to physical inactivity. Lastly, I wish to state emphatically my belief that heart pathology has never been initiated by sudden muscular strain or a nonpenetrating blow on the chest.

Dr. GOSLIN. We are now going to hear from Dr. Timothy Leary, medical examiner of Suffolk County. He will demonstrate to us the great importance of pathological examinations in addition to physical examinations.

The Importance of Post-mortem Examinations in Industrial Cases

By TIMOTHY LEARY, M. D., *Medical Examiner Suffolk County, Massachusetts, Professor Emeritus of Pathology, Tufts College Medical School*

It has been recognized since Cabot's comparison of the clinical and the post-mortem diagnoses in an analysis of 1,000 autopsies at the Massachusetts General Hospital that the clinical diagnostic error in determining the cause of death, even in carefully studied hospital cases, may be very high. Because of this inexactness an effort to obtain more accurate diagnoses and better vital statistics has resulted in a classification of hospitals which depend, in part, on the percentage of autopsies performed in fatal cases. When the clinical question is further complicated by the added necessity of determining the possible relation of the condition causing the death to industrial hazards, the probability of error without autopsy is markedly increased.

In criminal medico-legal investigations, where a death has occurred, it is accepted as only fair to the accused and the Government that an adequate post-mortem examination should be carried out. Such examinations have furnished the courts and the police with data which have often served to free the accused, or, on the other hand, to negative claims on his behalf that death was due to natural causes.

In dealing with industrial-accident claims the same reasoning should apply, out of fairness to the insured and the insurer. The problems which the industrial courts deal with may often be simplified if all of the facts can be presented. The pathologist in making a post-mortem examination of a body is given opportunity to carry out more complete investigation than is possible in the case of the clinical man who deals with the living. He can determine more definitely the relation of cause and effect, since he can study both grossly and microscopically the interrelation of lesions within the body and their possible connection with industrial hazards.

In the present paper a series of cases is presented illustrating the value of post-mortem examinations in bringing to attention harmful results of industrial hazards which would otherwise be overlooked or in elucidating problems presented by doubtful cases.

Under present conditions the determination that an autopsy is to be performed in industrial cases is made at least some days after the death, so that the pathologist is usually required to do his work on a body which has been embalmed.

Modern methods of embalming insure the preservation of the internal structures of the body for a period of months and even over a year after the demise, in such degree that not only gross but microscopical pictures will be well preserved. I have removed the spinal cord from a body buried 6 months and lying in water, and have been able to demonstrate the specific degenerations of the posterior columns of the cord, characteristic of tabes dorsalis, where a claim of injury to the back with resulting invalidism and death had been made. The response to Weigert's stain was typical. I have been able to demonstrate the presence of silicosis in the lungs 2 years after death, and the

absence of other than rare silicotic nodules in the lungs 4 years after death in another case in which it was claimed that death was due to silicosis.

The external surface of the body may be in a bad state of preservation. The skin usually shows an abundant growth of mold and is macerated, but the tissues of the body wall are usually well preserved and the internal organs, even the intestine, are in better state. The gross picture lacks the normal color, which is shrouded in formalin gray or red, and the outlines of focal lesions are blurred or obliterated. The consistency is also changed, all parts of organs which are well preserved being hardened to an even consistency throughout.

Artefacts due to the embalmer's trocar or to injection may seriously modify normal appearances. In a recent case an enormously dilated left ventricle led to a snap diagnosis of organic disease of the heart. The dilated ventricle contained, however, a curved cast of the arch of the aorta in well-fixed clot. Investigation showed that the body had been hastily embalmed by arterial injection at the place of death, and then shipped to an undertaker in the home town of the individual for burial. The second undertaker carried out thorough arterial embalming, using much force. The aortic clot had prevented the penetration into the left ventricle of the fluid used by the first embalmer, therefore the ventricular walls were not fixed. The second undertaker had used enough force to drive the clot through the aortic orifice into the ventricle, with a resulting wide dilatation of the cavity of the ventricle and fixation of its walls in the distended position. Careful examination of the heart and other organs disclosed no natural cause for the dilated ventricle, which evidently owed its appearance to artefact. The death was due to primary violence.

It is usual for the undertaker's trocar to puncture both heart and lungs, and bloody fluid is found in the pericardium and pleura. Puncture of the intestine and the delivery of contents into the peritoneal cavity produces a picture which may be mistaken for peritonitis. The distribution of blood and fluid in the lungs by the trocar may give rise to an appearance suggesting pneumonia, multiple hemorrhages, or multiple infarcts.

Not only should the operator in industrial postmortems have a wide experience, but he should be backed by all of the resources of a well-equipped laboratory, the microscope often furnishing the only data on which a diagnosis can be made, as in the cases of tabes and silicosis cited.

Bacteriological tests are sometimes valuable. For example, a man employed for many years as a wool sorter died as a result of a lung infection, which was diagnosticated clinically as anthrax, without bacteriological tests. Autopsy disclosed consolidation of the lung of the lobar type. Although the body had been buried for nearly 2 months, cultures from the lungs were made, on the ground that the consolidation might have prevented the introduction of the embalming fluid into the most firmly consolidated parts of the lungs. Cultures showed a growth of the pneumococcus and streptococcus with few contaminating organisms. No anthrax bacilli appeared. Since the pneumococcus and streptococcus are easily killed, while the spore bearing anthrax bacillus will resist conditions which lead to the death of nonspore bearers, it was concluded that the death

was due to ordinary lobar pneumonia. The failure to find anthrax bacilli in sections of the lungs or other organs confirmed the diagnosis.

The following cases illustrate the sometimes inconsistent character of antemortem and postmortem findings.

1. A man died shortly following a claimed injury of the left side of the abdomen. The symptoms were very acute and almost wholly abdominal. A diagnosis of ruptured gastric ulcer was made by the consulting surgeon. Autopsy disclosed a lower right-sided lobar pneumonia. As is known, this condition may give rise to predominant abdominal symptoms and the dullness may be masked by the liver dullness. Lobar pneumonia is a common disease, coming on without warning and usually independent of industrial conditions. In order to make pneumonia an industrial disease it must be proved that the individual had been exposed to the inhalation of irritant gases, or had been subjected to unusual exposure to the elements; or if the claim is made that the condition was due to traumatism, that the traumatism was sufficient in degree and applied to the region where the pneumonia appeared. In this case a minor left-sided injury could not produce a right-sided pneumonia.

2. I had turned over to me as medical examiner the body of a man who was sent to a local hospital for alcoholism. He was comatose on arrival and lived less than 24 hours. A hospital diagnosis of alcoholism was made. Although the sputum was bloody, no evidence of consolidation of the lungs was obtainable. Autopsy disclosed a hemorrhagic inflammation of the bronchial and peritracheal glands, with evidence elsewhere throughout the body of a hemorrhagic septicemia. Smears showed a gram positive bacillus in short chains. Cultures furnished a pure growth of the anthrax bacillus. Investigation of the man's employment then led to the discovery that he had been a teamster employed by a firm of hide weighers, who handled China hides. This was the third case of fatal anthrax arising among the employees of this firm. The man left a wife and four children who would have been doomed to pauperism were it not for the autopsy findings.

3. A youth had suffered an injury by the falling of a pair of tongs on his leg below the knee. There was no break in the skin. Later there developed swelling of the knee and ankle joints, accompanied by swelling of the leg and foot. Consultants made a diagnosis of rheumatoid arthritis. Autopsy disclosed a suppurative (staphylococcus) process of the leg and foot, the knee and ankle joints and the joints of the tarsus. Death was due to pyemia and the traumatism was a causative factor.

4. An apparently robust individual was employed in a chemical plant in which several deaths had occurred from nitrite poisoning. He was ill for 10 days with an obscure respiratory disturbance, which terminated fatally. The clinical diagnosis was central pneumonia with nitrite poisoning. Autopsy disclosed an acute general miliary tuberculosis. The only old foci of tuberculosis were found in the lungs in the form of closed caseous masses. The preservation of the lungs was imperfect in places, and the focus which by its rupture into a vessel produced the general infection could not be

found. The tubercles which had arisen in the lungs and other organs incident to the general blood infection were large, indicating a probable origin weeks before the death.

Acute general miliary tuberculosis arises as a result of the expansion of a closed caseous focus to the point where invasion of the wall of a neighboring vessel occurs, without, however, producing an occluding thrombosis. The caseous material undergoes liquefaction and the focus is converted into a cavity filled with a fluid containing a pure culture of the tubercle bacillus. Rupture of the cavity through the weakened wall of the vessel results in the delivery of the tubercle bacilli to all parts of the body through the circulation.

It was shown that the man was employed in the power plant of the chemical company, at a distance of one-quarter mile from the nitrating plant and was exposed to nitrous fumes, and then in the most minor degree, only when he walked to the office of the works, once a week, for the purpose of drawing his pay. This exposure was not adequate to produce changes which would have affected a closed lesion in the lungs, the rupture of which must have produced his general infection. That the exposure was slight, if any, was indicated by the absence of evidence of bronchial irritation. The death was due to natural causes.

5. A man employed in a print works was left at noon on one day in charge of a room where several rope soakers were running. His duty was to see that the rope yarn ran smoothly through the rope soakers. In one of these nitrous fumes were generated by a combination of nitrate of soda and hydrochloric acid. On the day in question new work was being tried out, and an excess of fumes was being generated, as later experience proved. A fan blower was used to remove the fumes, but was probably not working efficiently on the day in question. Decedent, who had always been in good health, with a record of a normal heart examination several months before, was so blue on his return home that night that his wife thought he was working with a blue dye. He complained of the fumes, and said that they made it difficult for him to breathe. Forty-eight hours later he suffered an attack of acute dilatation of the heart and was carried home by his boy on a hand wagon, crawling upstairs to bed on all fours. From this time he suffered from shortness of breath and died suddenly 4 months later.

The claim was made that death was due to heart disease, arising independently of his occupation. Autopsy disclosed a moderate degree of arteriosclerosis but no evidence of valvular or myocardial disease, and the kidneys were normal. Poisoning with nitrous fumes is peculiar, in that there may be no immediate symptoms other than temporary respiratory discomfort with cough, due to the local irritant action of the fumes. Later, possibly through the evolution of nitrites from nitrates within the body, acute attacks of cyanosis and dyspnoea—often with high-grade edema of the lungs—may lead to a fatal termination, or recovery for the moment may occur, to be followed by renewed attacks later. This delayed action of nitrous and other fumes furnished a considerable mortality in the World War, men recovering from the immediate effects of gassing to be found dead many hours later, particularly if they had been exposed to active phy-

sical stress during the interval. The condition in this case was initiated by exposure to nitrous fumes, and the death arose out of his employment.

6. A man employed as a carpenter in a print works was called upon to repair the doors of an outhouse, where nitrous fumes were generated. He was found sitting on the ground near the outhouse, dazed and spitting blood. He was brought home, where he lay in bed for several days, cyanotic and weak. His pulse and temperature were normal, though respiration was increased. He developed a typical hemiplegia (5 days), and died 9 days after exposure. Claim was made that the death was due to a spontaneous cerebral hemorrhage.

Autopsy revealed necrosis of the tracheal and bronchial mucosa, with scattered patches of terminal bronchitis and alveolitis, in many of which the alveoli were distended with plugs of fibrin, and few or rare polynuclears. The brain showed a massive hemorrhage with disorganization in the parieto-occipital region, and multiple petechial hemorrhages in both anterior and posterior portions of the corpus callosum. The arteries showed a minor degree of arteriosclerosis of the aorta and coronaries. The brain vessels were free from gross evidences of sclerosis. The heart and kidneys were normal. The peculiar character of the respiratory process, and the petechial hemorrhages in the corpus callosum, together with the absence of evidence of cardiorenal changes, took this case out of the group of spontaneous cerebral hemorrhages. The picture in the respiratory apparatus was consistent with poisoning from nitrous fumes. The death arose out of and in course of his employment.

7. A man employed in an ash cart collapsed at his work, was sent to a hospital, where he was admitted in an unconscious condition, and died after 48 hours of coma. It was claimed that his death had been due to injury incident to his work, although no specific history of violence was obtainable. Autopsy disclosed multiple abscesses of the spleen and a streptococcus septicemia. The abscesses showed, microscopically, beginning organization of the walls, indicating a probable age of more than a week, although the man had worked steadily up to his collapse, and nothing unusual in his appearance or actions had been noted by his coworkers. The death was due to natural causes.

8. A man employed in a stamping works had been disabled for months with symptoms which were largely cerebral. He had been seen by a group of specialists, who had arrived at a diagnosis of brain tumor. Autopsy disclosed no gross abnormality of the brain, nor other adequate cause of death. Chemical examination of the organs revealed large amounts of lead, to which he was exposed in his work.

9. A painter, moderately alcoholic, died following an illness of 10 days. There was some vomiting, with slight rise in temperature and respiration and marked prostration. A diagnosis of lead poisoning was made by his physician and a claim was filed that death arose out of his employment. At autopsy there was found a central pneumonia of the right lung, together with marked fatty changes in the liver, kidneys, and heart muscle. The chemist reported negative results of the examination of the whole of the heart, liver, spleen, brain, and kidneys for lead. An adequate cause for his death was

found in the lobar pneumonia, and the fatty heart, kidneys, and liver could have arisen from alcoholism, particularly with a terminal pneumococcus infection. The death was due to natural causes.

10. A teamster, employed in the transportation of heavy materials, had had a cough for some time. He had been examined by a physician, who had made a diagnosis of pulmonary tuberculosis. It was claimed that while lifting a heavy radiator decedent had a hemorrhage, which ceased temporarily, but he died at home 24 hours later from a second hemorrhage. Autopsy disclosed aneurysm of the aorta with rupture into the trachea. Testimony in the case brought out the facts that decedent backed up his tram to the doorway of a radiator warehouse; that the loading was done wholly by employees of the radiator company; that decedent was standing on the sidewalk, at ease, when the first hemorrhage arose. The death was due to natural causes.

11. A man of 55 years, employed in moving material in a factory by means of a box truck, claimed that he stumbled and fell, was shaken up, but was not bruised. He was not prevented from working for several days, but grew weaker, and died at home 5 weeks after the accident. It was claimed that his death was due to the accident. No specific diagnosis was made by his attending physician, but pain in the lower back had been constant, and terminal abdominal distension with fever had preceded the death. Autopsy disclosed a large, polypoid carcinoma of the rectum above the anus, with hemorrhagic enteritis of the large gut, which was markedly distended. Acute general peritonitis was the immediate cause of death. The new growth, which was at least several months old, lay deep within the true pelvis, in a position where it could not have been injured as a result of the traumatism claimed. The death was due to natural causes.

12. A young man employed in a sewage works was found lying in a mass of sludge, dead. The question arose as to whether death was due to heart disease or to violence. There was a laceration of the tissues of midforehead above root of nose 2 inches long. Dissection disclosed a fracture of the anterior wall of the right frontal sinus, which extended beyond the middle line. There was separation of the mucosa lining the anterior wall of sinus, and a small amount of blood was found between mucosa and bone. The rest of skull and the brain were intact. Lying in the primary bronchi was a mass of sludge corresponding to the material in which the body was found. The organs, otherwise, were those of a normal individual. The fall, apparently against the concrete edge of sewer basin, had produced unconsciousness, and drowning followed. The death arose out of his employment.

13. A schoolhouse janitor was seen trying to walk out of the school yard, when he collapsed and remained unconscious until his death. The local medical examiner viewed the body and made a diagnosis of death from natural causes.

Autopsy disclosed fracture of the sternum, 19 fractures of ribs and 3 of rib cartilages, fracture of the pelvis and of the right femur, and a subdural hemorrhage. A window onto the roof of the school building was found open, and it is probable that decedent fell from the roof to the ground.

14. An insurance collector, 60 years of age, went out of the door of a second-story tenement. A noise was heard, and decedent was found at the bottom of the stairs. He was offered a drink of water, which he reached for, but he suddenly collapsed and died. The local medical examiner, when called, could not determine the cause of death, and so notified his district attorney, who refused permission for an autopsy. The death was therefore certified as due to organic disease of the heart. Autopsy discovered a fracture of the odontoid process of the axis, with fracture dislocation of the first on the second cervical vertebra, and a crush of the cord. There was found chronic interstitial nephritis, with hypertrophy of heart and aortic insufficiency.

15. A man of 45 years was struck on the head by a brick falling from a staging overhead. He was unconscious temporarily, but regained consciousness, was disabled for a few days, and dizzy for a longer period. At intervals during the following year he had several attacks of temporary unconsciousness, followed by periods of weakness and dizziness. About a year after the accident, he lapsed into unconsciousness, deepening into coma, with stertorous respiration, and died after an illness of several days. At autopsy, the subdural space on the right was occupied by a firm, oval, padlike mass of clot, which overlay and compressed the right cerebrum. The mass was sharply circumscribed, and was rather firmly attached to the dura in places. The death was due to subdural hemorrhage, having its origin in a traumatism produced by the injury.

16. A stableman 62 years of age, who had gone into a loft for the purpose of putting down hay for the horses, was found an hour later on the floor below, unconscious, breathing stertorously. There was no external evidence of violence. He was admitted to the hospital, unconscious, with a typical right-sided hemiplegia, and inconstant pressure symptoms on the left. A diagnosis of spontaneous cerebral hemorrhage was made. Autopsy disclosed fracture of the skull, with subdural hemorrhage, and contusions and laceration of the brain, most marked on the left side. His death was due to a fall from the loft.

17. A man of 40 years, employed as a driver of a coal team, was seen to walk from his team, after elevating the body by means of a pinion and ratchet mechanism, actuated by a hand crank, and collapse on the lawn of the house in which he was to deliver the coal. He was removed in an ambulance to a hospital, where he died within a few minutes after arrival. A diagnosis of disease of the heart was made. Autopsy disclosed universal arachnoid hemorrhage. The cerebral arteries were free from evidence of arteriosclerosis. The heart and kidneys were normal. The stress of elevating the body of the wagon had probably increased his blood pressure to the point where rupture of an arachnoid vein followed.

18. A porter 70 years of age fell from a stepladder, sustaining injuries of the left shoulder and side. He suffered disability, marked by dizziness and weakness, for several months, and died. It was claimed that the fall was the cause of his death. At autopsy, there was found high-grade arteriosclerosis of the aorta, coronaries, and cerebral vessels. There was marked chronic interstitial nephritis and chronic interstitial myocarditis. The brain showed cysts of

softening of a small portion of the right marginal gyrus, and of the superior surface of the right cerebellum. The process in the cerebellum was situated in a region so protected from the effects of external violence that it is practically impossible that contusion from external violence could have been its cause. It would be necessary to crush the overlying cerebrum, by extreme violence, before the upper surface of the cerebellum could suffer, and the overlying brain in this case showed no evidence of such violence. The focus in the marginal gyrus was so small and circumscribed that it is improbable that violence would have caused it, without also producing other evidences of injury in the scalp, skull, or cerebral vortex. Moreover, both lesions corresponded in location to the distribution of vessels. The reasonable conclusion is, that these lesions arose as the result of thrombosis or embolism of the vessels supplying the affected regions. No source of embolism nor evidence of embolism in other organs appeared, so that thrombosis was the more reasonable cause of the regions of softening. The death was due to natural causes.

19. A stonemason was seen to collapse at his work and was thought to have fallen over a projecting piece of wood. He was unconscious momentarily, but recovered consciousness and was brought home. There developed slowly a hemiplegia, followed by coma and death in 4 days. The necropsy disclosed no evidence of injury to the scalp. When the skull and dura were opened, there appeared a hemorrhage spreading over the surface from the region of the Sylvian fissure on the right side. At a glance the picture suggested a traumatic hemorrhage, arising in the cortex of the brain. Dissection revealed, however, complete disorganization of the caudate and lenticular nuclei, with extension through the insula to the pons, and thence to the membranes over the convexity of the brain. The cortex, except in the insula, where extension was direct, was intact. The hemorrhage arose from spontaneous rupture of the lenticulo-striate artery in the typical location of spontaneous cerebral hemorrhages, and was unusual only in its extension to the membranes on the surface of the brain, which was a terminal lesion. The man was not doing laborious or unusual work. The process was due to natural causes. The fall followed the hemorrhage.

20. A young colored woman was brought into a local hospital, in a semiconscious condition, with a history of having fallen downstairs 10 days previously in a factory. She did not lose consciousness, but vomited several times. She had been unconscious for 2 days before entrance. There were no focal symptoms. Diagnoses of fractured skull and hysteria were made. A claim was filed that the fall had led to injury of the brain and possibly of the skull. Autopsy disclosed an extreme atrophy of the liver, with nodules of regenerating liver tissue scattered over the surface. Microscopically the liver tissue was replaced wholly by low-grade connective tissue, except in the nodules, which showed a typical lobule formation. On a generous estimate, less than one-tenth of the shrunken organ was made up of liver tissue, capable of function. The brain showed only edema. There was no evidence of injury to the scalp, skull, or brain, nor indeed were evidences of traumatism found anywhere in the body. The color of the skin had concealed the jaundice which was present. It was concluded that the death arose as a result of atrophy

of the liver, with terminal edema of the brain, and was not due to the traumatism claimed. The amazing element was not that the patient had died so soon, but that she had lived so long. Further investigation brought out the fact that about 2 months before her death decedent had volunteered to dish out ice cream to a church society of which she was a member, and had had the privilege of eating what was left in the bottom of the ice-cream can. This was one of three cases of fatal atrophy of the liver occurring in colored women during the summer in question. All of these young women had a history of having served ice cream at functions, with the privilege of eating what was left in the containers. No patrons who purchased their ice cream gave evidence of any disease. The factor of dosage was evidently important. The same caterer furnished the ice cream in each case. Whether bacterial toxins or metallic poisons from the containers were responsible for the atrophy of the liver could not be determined, since the poisoning had occurred, as indicated, 2 months before the death.

Comment

These cases speak for themselves. The value of the postmortem investigation is evident. In some States necropsy of a body concerning which there is an industrial claim is required by law. At least in those cases in which no relatives survive or are present in the jurisdiction or in the country the industrial accident board or commission should be authorized as next friend to intervene and obtain information which should help to clear up the case. This practice obtains in public hospitals here when no relatives survive, the trustees of the hospital being empowered to authorize post-mortem examinations.

DISCUSSION

Chairman DONOGHUE. The meeting is now open for discussion. Before you start I should like to ask Dr. Codman, for the benefit of the lay people here, to show what injury to the supraspinatus is. There may be somebody here who would like to know what is meant by this crippled shoulder when it comes to the rupture of this particular muscle, the supraspinatus.

Dr. CODMAN. You must not think that every shoulder injury is a ruptured supraspinatus, and also you must not think that every case of supraspinatus injury must be operated on. Only those cases where the symptoms are clear should be explored. If a person has had experience with them and is in doubt, I feel that exploration is justified, but I think that for the average surgeon or doctor, who has not carefully studied the shoulder, to do exploration in cases which do not have the symptoms that I am about to give is going to discredit the operation when ultimately it is performed. In the first place, it would be unsafe to make a diagnosis of this injury in young men or young women. It is almost always after 40, usually 50 or 60 years and almost always in laboring people. It seldom occurs—I have seen only two cases—in what we call the "white-collar class."

These patients have a great deal of pain. They complain bitterly of pain in the shoulder, particularly at night, and during the first week of the injury that pain is intense. They often say they walk the floor. Their chief statement is that they cannot raise their arms, although the shoulder looks normal and the X-ray shows it is normal, they persist in this statement that they can not raise it.

If the patient's arm is bound by adhesions so that you cannot raise it, it is pretty sure that he has not got a supraspinatus rupture. To check that, make the patient stoop over and let his hand hang down. If the effort is made to raise the arm when he is in the standing position he cannot do it, but in the stooping position, where gravity does the elevation of the arm for him, the arm will be seen to move through nearly a complete normal arc. If he is in the later stages, as he raises his arm he raises the scapula, the shoulder blade, and humerus together, like this [demonstrating], and then, after a sort of contortion, perhaps raises it up the rest of the way but with great difficulty, and if he holds his arm out straight like this [demonstrating] a child could put it down, because he has no muscle here [pointing] to hold the head of the bone on the fulcrum. Now as this motion is made, as the examiner makes it as he holds his finger on the patient's shoulder at a point just below the acromion, there is a definite snap when the angle changes from the horizontal to the vertical as the tuberosity, which is bare where the tendon was ruptured, makes a jog as it passes under the acromion, and that jog is accompanied by a sharp pain within the patient and by a crepitus which is sometimes loud enough to hear, and usually easily recognized by the examiner's fingers. Those are the chief symptoms.

Mr. HARTWIG (Oregon). Does the pain radiate down toward the center of the chest in a case like that?

Dr. CODMAN. I have not marked it in the center of the chest. The pain may radiate down into the ulna or radius district, or may be felt in the side of the neck, but there is often localized pain, and particularly the sharp pain when the snap occurs.

Dr. COX (Massachusetts). In these back cases, if the back has been fused and the man is still injured, what is the treatment for that?

Chairman DONOGHUE. I think Dr. Goldthwait has some ideas on where the stress is transferred after the back has been fused. Perhaps he will answer that question.

Dr. GOLDTHWAIT. It is pretty difficult to tell, after the back has been fused, what you are to do. In case fusion is considered necessary, and my personal impression is that that represents a very limited number of cases, the back should be straightened in the first place so that there is adequate space between the articular processes, and so that there will be no unnatural interference with the circulation, or enervation either. One of the difficulties, as I see it, in a lot of cases is that the fusion has been performed before the back has been straightened, and you have a condition analogous to the anatomical drawing which I showed you, where the space at the joint formed by the articular process is narrow anyway. If you have the post-operative thickening, which is a part of the fusion, added onto it, you have a condition many times which is more disturbing from

the point of view of that local physiology than it was before. Of course, once the spine is fused, other joints are forced to take up some of the work that those joints that are now stiff formerly performed, and this means that the joints that have to take up this new work, being less used to that work, are much more likely to give out.

Mr. HARTWIG. May I ask, doctor, your experience in this matter? Quoting one of our doctors in Oregon, Dr. Delahunt, whom you probably know, he said that oftentimes he finds the sacroiliac fusion operation a failure because in his opinion the sacrum should have been fused also when that operation was done, and I wondered what your experience had been here. He pointed out to me a short while ago that in the instances where he had had complete success that was due to the fact that a cast had been placed on the back, and that a fusion had actually occurred on the sacrum at the time the sacroiliac fusion was done, or following the operation. I wondered what you thought about that.

Chairman DONOGHUE. I think he means a lumbosacral plus a sacroiliac.

Dr. GOLDTHWAIT. Let me understand this correctly. You said in the sacroiliac fusion the feeling was that the sacrum should be fused also.

Mr. HARTWIG. Perhaps I am not using the correct term. Perhaps it is the lumbosacral; the one I mean rests upon the spine.

Dr. GOLDTHWAIT. I just wanted to be sure. Of course, the more you fuse, the more disability there will be from the limited motion. As a matter of fact, my personal feeling is that fusion of the sacroiliac joints is very rarely necessary; that only in a very limited number of cases should that be considered, I am sure. On the other hand, as to the lumbosacral mechanism you have there things we did not have time to bring up but which were indicated in what Dr. Sever said. There you have your anatomical malformation, all sorts of peculiarities which have to be taken into account in figuring the plan of handling it. But even there, a lot of these cases that have anatomical peculiarities, which have been there all their lives, with a little mechanical readjustment can be returned to industry just as Dr. Phipps specified. I was delighted to hear what he said about the heart cases, because I am sure that there are a great many cases where we say the heart is damaged and yet it is a good heart from the point of view of function. You spoke of the sacroiliac, the region where the spine rests on top of the sacrum, even there, in a very large back clinic, we very rarely ever fuse the joint. Our cases are not all successes, of course. Nobody ever has complete success in every case, but the percentage of failures is very, very small. I am not dealing now with the industrial-accident cases, because I seldom see them—only in consultation—and there is very little opportunity for handling those cases. My work deals very largely with the ordinary difficulties of the back. It is a very big operation if you fuse the sacroiliac joint and fuse the spine at the same time, and rarely, I am sure, is it necessary.

Mr. FOYNES (Massachusetts). We are beginning to meet the rupture of the supraspinatus quite often now, and I should like to ask Dr. Codman what the objective signs are from the point of view of

a claims manager, when he has first determined that this rupture is present. Then I should like to ask him what he recommends in the way of radical cure, and how long and with what result.

Chairman DONOGHUE. That is a pretty complicated question. Dr. Codman has covered most of it. Perhaps Dr. Codman would answer briefly how long a case should go undiagnosed and what treatment is indicated.

Dr. CODMAN. It is almost silly to have written a 500-page book on a situation in which I have only sutured successfully some thirty-odd cases, I think it was. They are certainly very few. I have attempted them long after the injuries. I have never yet seen a case immediately after the injury or within a few days after the injury. If my propaganda to the American College of Surgeons is successful, then some of these days I hope to see a fresh case. But, as I have explained, fresh cases are not at present recognized, and if the doctors did recognize them, they would try operating on them themselves instead of asking me to see them.

[Chairman Donoghue extended to the men who read the papers and to the presiding officers, Dr. Cornwall and Dr. Goslin, the thanks of the Massachusetts Industrial Accident Board, and of the International Association of Industrial Accident Boards and Commissions.]

[Meeting adjourned.]

THURSDAY, SEPTEMBER 27—MORNING SESSION

Chairman, JOSEPH A. PARKS, President I. A. I. A. B. C.

[The report of the auditing committee was read and adopted.]

[The report of the nominating committee was presented. The list of officers will be found on p. 266. North Carolina was recommended as the meeting place of the next convention, the place where it is to be held to be selected by the president. The report was adopted.]

Chairman PARKS. We have a report from Mr. Stephen B. Sweeney.

[Mr. Sweeney read the report of the special committee appointed, in accordance with a resolution adopted at the last convention, to study the situation in the various States and Provinces regarding the determination of the average weekly wage. The committee so appointed was as follows: Stephen B. Sweeney, of Pennsylvania; Mrs. Emma S. Tousant, of Massachusetts; Charles F. Sharkey, of Washington, D. C.]

**REPORT OF SPECIAL COMMITTEE ON AVERAGE WEEKLY WAGE BASES,
WITH SPECIAL CONSIDERATION OF THE EFFECT OF WIDE-SPREAD
INTERMITTENT EMPLOYMENT**

By STEPHEN B. SWEENEY, *Chairman.*

In 1922 the United States Department of Labor published a very fine study by Carl Hookstadt entitled "Comparison of Workingmen's Compensation Insurance and Administration." It contains a thorough analysis of the various methods of computing average wages. What he said then is still true, that "the methods of computing the average weekly wages on the full-time basis are comparatively simple and without any great difficulty as to application. The real problems arise when an injured workman has worked only a part of the time stipulated in the law" as the basis for determining his average wage. He pointed out three general situations recognized by the various laws which still prevail. The first is where the employee has been employed continuously for a considerable length of time but less than the statutory wage-basis period. The second is where the injured worker has been employed only a short length of time, such as a few hours, and it is very difficult to determine what his average wages would have been. The third is where the injured employee's work was seasonal.

Our study omits any consideration of seasonal wage bases, since these are not of such major importance at this time. We stress another situation which Hookstadt did not consider extensively—the case of the employee whose connection with his employer has been continuous but whose employment has been intermittent or part time. The popularity and necessity of short-week and staggered-work plans probably has never been so great as during this depression.

Upon what average wage should a man's compensation be based who has worked only intermittently for an employer during the 6 months, 1 year, or

2 years before his accident? Should his weekly wage be considered to be five and one-half times his average daily wage, as it is in effect in the majority of the important industrial States, or should it be considered as his total earnings over a stipulated period divided by the number of weeks worked. The latter method resulted in compensation of 57 cents per week for a totally disabled skilled worker, during a temporary breathing spell gained by the employers from the superior court in Pennsylvania before the supreme court very properly "spanked back" the interpretation to the 5½-day basis, which gave the same claimant the maximum compensation of \$15 per week.

This association was fortunate in having Dr. Stack of Delaware present a very fine paper at Columbus in 1932, proposing a solution of this problem. His proposal was not received with enthusiasm. Practically all of the discussion of his paper centered on a criticism of his suggestion to compensate short-time disabilities on the basis of actual average weekly wages earned prior to the accident, as contrasted with the usual arbitrary basis of five and one-half times his average daily earnings.

Partly because of this criticism and the indications that the five and one-half basis was being attacked legislatively and judicially in its former strongholds, this committee was appointed to make a study of the existing situation. The method followed was to prepare a graphic summary of the various statutory methods of finding the weekly wage on which compensation is based. Most of you have seen a blueprint of that analysis, as one was sent to all of the compensation States and Provinces for criticism. A questionnaire was prepared which asked for indications of any different plans followed in the case of irregular or intermittent employment, with particular reference to the effect of the N. R. A. codes on the statutory-wage basis. In connection with this questionnaire we must compliment the industrial accident officials of the United States and Canada, for, with but one exception, every questionnaire was answered and in many cases supplemented by explanatory letters and copies of important court decisions.

[Questionnaire mailed to Industrial Accident Commissioners of each State in connection with graphic summary of compensation-law wage provisions reproduced below]

DEAR-----

The enclosed blueprint summarizes the apparent meaning of the wage-basis provisions of each workmen's compensation law.

As to regular employment in your State, is it correct ----- or incorrect -----

As to irregular employment is it correct ----- or incorrect -----

If incorrect what decisions modified the apparent meaning of your statute?

In what way, if any, has your wage basis been affected by the N. R. A.?

Please cite any decisions on this point.....

Methods of finding the weekly wage on which compensation is based—State workmen's compensation laws

State	Period of employment specified	General formula	Minimum period in States that refer to another worker	Apparent results for one regularly employed	
				5 days per week	6 days per week
Wis.....	12 mo.....	Earnings+days worked×300+50.....	12 mo.....	●●●●●●	●●●●●●
D. C.....	} ..do.....	Earnings+days worked×300+52.....	..do.....	●●●●●●	●●●●●●
Ida.....					
Ill.....					
N. Y.....					
Okla.....					
S. D.....					
Tex.....					
Iowa.....	..do.....	Earnings+days worked×normal work year÷52.....	..do.....	●●●●●●	●●●●●●
Mo.....	6 mo.....	Earnings+days worked×5½.....	.....	●●●●●●	●●●●●●
Del.....					
Kan.....	..do.....	Earnings+days worked× } normal work {	.....	●●●●●●	●●●●●●
N. J.....	..do.....	Earnings+days worked× } week—5 min. {			
Pa.....	..do.....	Earnings+days worked×5½ minimum.....			
Ala.....	} 12 mo.....	Earnings+weeks worked.....	1 week.....	●●●●●●	●●●●●●
Col.....			△.....		
Ind.....			△.....		
Mass.....			△.....		
N. M.....			1 week.....		
N. C.....			△.....		
Tenn.....			△.....		
Va.....	△.....				
Conn.....	6 mo.....	Earnings+weeks worked.....	2 weeks.....	●●●●●●	●●●●●●
R. I.....					
W. Va.....	A reason-able time.....	Earnings+weeks worked.....	.....	●●●●●●	●●●●●●
N. D.....	12 mo.....	} As the commission sees fit.....	△.....	●●●●●●	●●●●●●
Vt.....	12 weeks.....				
N. H.....	12 mo.....				
Neb.....	6 mo.....				
Ky.....	.....	Wages when working "full time".....	.....	●●●●●●	●●●●●●
Md.....	.....	.....	.....	.....	.....
Utah.....	.....	Wages at time of injury×300+52.....	△.....	.....	●●●●●●
Mich.....	.....	Wages at time of injury×6.....	△.....	●●●●●●	●●●●●●
Minn.....	.....	Wages at time of injury×N. W. W. 5½ min.....	.....	●●●●●●	●●●●●●
Cal.....	12 mo.....	Wages at time of injury×N. W. W. 5 min.-95%.....	260 days.....	●●●●●●	●●●●●●
Ore.....	.....	Wages at time of injury×26 monthly.....	△.....	●●●●●●	●●●●●●
Me.....	250 days.....	} Wages at time of injury.....	△.....	●●●●●●	●●●●●●
Ariz.....	.....		30 days.....		
Ga.....	.....		△.....	
La.....	.....		.....
Mont.....	.....		△.....	
Nev.....	.....	.....	.....	.....	.....
Ohio.....	.....	.....	.....	.....	.....

Washington and Wyoming: Compensation not based on earnings—fixed by statute.
 Arkansas, Florida, Mississippi, and South Carolina: no law.
Earnings = Total earnings of specified period.
Days worked = Total during specified period.
Normal work year = Normal total working days in year.
N. W. W. = Normal work week.
 ● = daily wage.
 △ = when necessary or desirable.

Careful restudy of the original analysis, in the light of the returned questionnaires and supplementary information, disclosed the possibility of a broad threefold classification of the numerous statutory wage bases in effect throughout the United States and Canada. This relatively simple classification is colored possibly by the point of view of this committee—that the wage basis should develop the wage of normal full-time work. This position is defensible if we remember the plight of those disabled for long periods and the reducing factors in compensation, such as the usual 65-percent feature, the low maximum weekly compensation limits, and the low maximum amount limits found in most States.

A broad classification of wage bases in State workmen's compensation laws shows three main groups:

1. Those laws which determine statutory weekly wage by multiplying average daily wage by some arbitrary minimum normal work week such as 5, 5½, or 6 days. This method develops the wage which the worker will be prevented from earning in normal times because of his injury. It seems the fairest basis since workmen's compensation was not founded on the principle of mere indemnification for proven loss. With certain exceptions, to be noted in connection with the N. R. A., the regular statutory basis was used even in the case of intermittent employment.

2. Those laws which determine statutory weekly wage by ascertaining what wages would be if the worker were working "full time." On first consideration this appears to give as liberal treatment to the worker as the first method, but second thought will disclose that under this arrangement an N. R. A. code automatically determines permanently the work week and wage for compensation purposes, without regard for the admitted temporary nature of the N. R. A.

3. Those laws which apparently are not concerned over reimbursing an injured worker on the basis of what he probably will be prevented from earning. They determine the statutory weekly wage by a mere averaging of past total earnings over the number of weeks worked. It was this method which gave the 57 cents weekly compensation for permanent disability referred to above, which later became \$15 compensation per week when the first method was reestablished by the Supreme Court of Pennsylvania.

We would place in the first or liberal classification those 22 laws using the following general formulas noted in the graphic summary:

1. Total earnings ÷ days worked × 300 ÷ 50 weeks.
2. Total earnings ÷ days worked × 300 ÷ 52 weeks.
3. Total earnings ÷ days worked × 5½ days.
4. Total earnings ÷ days worked × normal work week—5 days minimum.
5. Total earnings ÷ days worked × 5½ days minimum.
6. Daily wages at time of injury × 300 ÷ 52 weeks.
7. Daily wages at time of injury × 6 days.
8. Daily wages at time of injury × normal work week—5½ days minimum.
9. Daily wages at time of injury × normal work week—5 days minimum.
10. Daily wages at time of injury × 26 days per month minimum.
11. Compensation amount fixed by statute regardless of wages.
12. Total earnings divided by weeks actually worked.

The laws falling within this classification fortunately include the majority of the leading industrial States and are as follows: California, Delaware, Dis-

trict of Columbia, Iowa, Illinois, Kansas, Kentucky, Louisiana, Michigan, Minnesota, New Jersey, New York, Oklahoma, Oregon, Pennsylvania, South Dakota, Texas, Utah, Washington, Wisconsin, Wyoming. Massachusetts is also placed in this group because of its famous Bartoni's Case, which held that 12.97 weeks' lost time should be deducted from the usual divisor of 52 weeks in determining the average weekly wage.

The second group of laws, which under more normal conditions would appear to have liberal wage bases but which are automatically deliberated by the N. R. A., use the following general formulas:

1. Total earnings \div days worked \times normal work year \div 52.
2. Weekly wages when working full time.

The States are the following: Maryland, Nebraska, New Hampshire.

The third group of laws, which appear to be based on the narrow principle of indemnity for loss, the proof of which actual loss is confined to a limited period before the accident, include 19 States and at least 4 of the Provinces. The following general formulas are used:

1. Total earnings \div weeks worked.
2. As the commission sees fit.¹
3. Wages at time of injury.

The States and Provinces are as follows: Alabama, Arizona, Colorado, Connecticut, Georgia, Idaho, Indiana, Maine, Montana, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Rhode Island, Tennessee, Vermont, Virginia, West Virginia, New Brunswick, Nova Scotia, Ontario, Quebec.

Those States which have been classified in the first or liberal group will have to be divided further to take account of the States that have had their liberal wage basis reduced somewhat by decisions allowing N. R. A. code weeks to supplant their statutory work weeks for determining weekly wage. New Jersey, Texas, and Utah have bowed to the N. R. A. by board or commission action. In Louisiana and Wisconsin the courts have decided in favor of the N. R. A. codes over the statutory wage basis.

The Louisiana Circuit Court of Appeals in *Suire v. Union Sulphur Co.* (no. 1331, first circuit, June 11, 1934) first quoted the following reasoning of the lower court:

The reasons for holding that an injured employee working but 3 or 4 days a week, due to unusual economic conditions, is entitled to compensation at 6 times his daily wage, are equally applicable to a case where, due to unusual economic conditions creating an emergency, Congress enacts temporary legislation which will be in effect less than one-third of the time compensation is to run in this case, limiting in effect the number of 8-hour days an employee can work in a particular industry. The Recovery Act expires in about 65 weeks from this date, while the weekly compensation payments due the plaintiff run for about 287 weeks from this date, or for 222 weeks after the act in question is no longer in effect. If, by a general custom, legislative enactment or Federal law, the working week is fixed at $4\frac{1}{2}$ or 5 days, then of course compensation will be based upon $4\frac{1}{2}$ or 5 times the daily wage. Federal legislation resulting from unusual and temporary economic emergency and having for its purpose the alleviation of the evils of that emergency by limiting the number of working hours per week, cannot be said to fix the number of working days per week under our compensation statutes, where such Federal law is by its terms to be in force less than one-third of the period during which compensation is to be paid under our law.

Compensation is based on daily wages, as daily earning capacity. Temporary economic depression and temporary legislation enacted because of such depression, resulting in fewer than 6 working days per week, is not a proper

¹ Hookstadt puts these 2 States, Vermont and North Dakota, into averaged wage group.

measure of daily earning capacity. The legislature, in providing for compensation based on daily earning capacity, had in mind earning capacity under normal economic conditions which will provide full-time employment. This is evidenced by the change which the lawmakers effected in substituting the daily wage for the average weekly wage as a basis for compensation.

The opinion proceeds, quoting the opinion of Judge Cline in the case of *Rankin v. Zurich General Accident & Liability Insurance Co.*, no. 17162 on the docket of the district court, in which Judge Cline, reasoning along the same line, holds that a 6-day week is intended by the employers' liability act, and must be used for the purpose of fixing compensation under the act. It will be seen from the opinion, however, that the lower court entertained the view that—"If by a general custom, legislative enactment, or Federal law, the working week is fixed at 4½ or 5 days, then of course compensation will be based upon 4½ or 5 times the daily wage." In *Hylander v. T. Smith & Son, Inc.*, the supreme court, quoting from *King v. American Tank & Equipment Corp.* (La. App.), 144 So. 283, 289, and commencing with the statement, "Under defendant's contention [to the contrary], one injured while working only 1, 2, or 3 days a week", etc., says with reference thereto:

This was correct. The workmen's compensation statute is not a statute allowing the workman damages for injuries sustained in the course of his employment even through the negligence or fault of his employer. It is essentially insurance against the loss or diminution of earning capacity.

In spite of its sympathetic review of this reasoning the upper court decided in favor of the N. R. A. code over the statutory 6-day rule as follows:

We have considered the fact that the act of Congress is not intended to be permanent, that it is emergency legislation temporary in its idea, and may by proclamation of the President or act of Congress be terminated any time, as provided for in section 2, subsection (c) of the act (15 U. S. C. A. no. 702 (c)). We have no way of finding out what may take place, but the law as in force at the time Pierre Suiire sought employment under the code, at the time he was hired, during the time he was employed, and at the time he lost his life, should have the effect it was intended to have, without going further and giving it an effect, in the matter of the payment of compensation, which seems to be not in harmony with the congressional plan on the subject of employment.

The Supreme Court of Wisconsin in *Allis-Chalmers Mfg. Co. et al. v. Emilson et al.* (January term 1934, no. 171), also upheld the priority of the N. R. A.

A night watchman was fatally injured after he had worked for his employer only 4 days, and had not worked at all during the year preceding such employment and had not worked steadily during the 2 or 3 years prior thereto. Held the employer was liable under the Wisconsin act for compensation on the basis of "average annual earnings" computed in accordance with the average daily wage for the 6-hour day and 5½-day week in effect at the time of the accident under the N. R. A. code to which the employer had become subject 10 days prior thereto, and not for the 12-hour day and the 7-day week in effect prior to the code and under which other employers had worked during the previous year, which would have been the basis of determining the average annual earnings under the Wisconsin act. The annual earning basis is definitely fixed by the code during the week preceding the accident. The 12-hour day and 7-day week had theretofore been outlawed and discarded by the code and had therefore been definitely eliminated as a basis for the computation of annual earnings, since compensation is payable according to probable future earnings and not past earnings.

This case, however, was one of less than a year's employment of the claimant and therefore came under rule of wage of fellow worker. The court might have insisted on the liberal 300-day rule if the injured had been working for over a year and there had been no excuse for going to another worker's wage as a basis.

The committee feels that the extreme difficulty experienced in classifying the average wage bases of workmen's compensation laws is sufficient indication that something should be done by this group toward standardization. This need is further emphasized by the different reactions to the N. R. A. It is therefore urged that the entire subject be submitted to the legislative committee for study and report at the next annual meeting.

DISCUSSION

Mr. WALKER (North Dakota). I should like to ask a question. We have a problem in North Dakota that is perhaps unique. We have many farmers, who have never been in industry, working for relief. In some cases in some of the political subdivisions, working for what we call "feed relief", they work as many as 60 hours a week, whereas in other cases, perhaps in the same political subdivision, working for what we call "human relief", they are limited as to the number of hours—in some cases as few as 15 hours a week. There is also a difference in the hourly compensation ranging from 30 to 50 cents an hour. In some subdivisions, working for "human relief"—direct relief—they are paid as low as 30 cents an hour, and in working for "feed relief" they are paid up to 50 cents per hour. It has been very difficult for us to determine what was just in working out compensation in those different cases. I have in mind a death claim that was filed a short time ago. An old man, he was 74 years old and very feeble, was permitted to work 8 hours a week. He had no future in the industrial field; he had no future as a farmer; he had outlived it. On what basis, if we assumed liability, could we determine a just wage for that man?

Those are problems we have had to meet, and we are frankly confessing that we have not sufficient wisdom to determine what is just, and we would like some advice on that question from this body.

Mr. SWEENEY. I should say off-hand, though I realize it is not a complete answer to your question, that while the Pennsylvania system of handling relief injuries has many shortcomings, I would rather see the Pennsylvania system established than permanently to undermine the sound basis of determining a man's compensation by what he would earn in the future if he had not been injured rather than by what he happened to have earned in the past during a period of great industrial chaos. I have briefly described the system, but I think possibly it will bear repetition. I am not defending it except in this particular instance. It is this: In relief cases we more or less set aside our workmen's compensation law during the first 26 weeks of disability, assuming that the relief situation will continue, and the man will be taken care of by relief, except that in cases of permanent disability or death the man or his widow goes on the regular 5½ basis—compensation based on 5½ times the daily wage. You ask why should you compensate for death. Because either you are going to have to take care of the widow indirectly through relief, with all that means from a social standpoint, or you are going to have to take care of her directly through compensation. It is about a 50-50 industry or relief loss, isn't it? That is, you created the work, and from that standpoint it is industrial loss, but you only created work because of the relief situation.

Mr. WALKER. The purpose is this: Here is a State fund, contributed by employers, and it is a question whether the employers of North Dakota are going to take care of the family of the farmer who loses his life in relief work, or whether society, the taxpayers in North Dakota, are to assume the burden.

Chairman PARKS. I can see where this discussion is going to lead, and this paper that Mr. Sweeney read had no bearing, really, on it at all. I can appreciate the gentleman from North Dakota looking for help.

Mr. FUNK. (Iowa). May I suggest a correction? I think as a matter of justice to the people of Iowa I should do so. I appreciate the paper very much but our State is in the more liberal classification. In presenting our law he is making his own interpretation and has not followed the decision of our supreme court. We belong in the more liberal classification.

Chairman PARKS. You will recall that on Monday we had a discussion on the effects of the N. R. A. codes on workmen's compensation administration: "Does the Federal Emergency Relief Program place the responsibility for compensation on the locality, or should the Federal Government assume this obligation?" Then there was another: "Are beneficiaries under the made-work or relief program employees within the meaning of the workmen's compensation act? If so, employees of whom?"

These things were under different headings entirely. Mr. Sweeney's paper is "What does the average weekly wage mean in the code?" Of course, there is not a single man here who does not have some workmen's compensation problem. I probably have one or two on my desk that I do not know what to do with, but I do not expect anyone here to tell me the way out. You have to apply these reasons on the average weekly wage right to it.

Mr. SWEENEY. My answer to the Iowa situation is that that was not indicated on the returned questionnaire.

[A motion was made, seconded, and carried that the average weekly wage report be accepted and turned over to the legislative committee.]

Chairman PARKS. Now, we will hear from Mr. Stewart on the constitutional changes.

Mr. STEWART. At the last meeting I was appointed on a committee to rewrite the constitution. The committee has done so, making as few changes as seemed possible. We have left the name of the association alone because I could not think of a worse one. We have cut out most of article 2, which tells how to make our programs. I have been helping to make programs for 14 years, and I did not know until I revised this constitution that the constitution tells what subjects we could not discuss.

I think in justice to you all the proposed constitution should be read in full. It is only two typewritten pages and, if you will permit me, I am going to ask the secretary to read it.

[Secretary Baldwin read the proposed revision of the constitution, and after some discussion and a few accepted changes, a motion was made and passed that the proposed revision with the changes sug-

gested be the constitution of the association. The constitution as adopted will be found on p. 269.]

Mr. **ANGSTEN** (Illinois). At the session presided over by Mr. Baker it was voted that the subject of emergency relief be referred to a committee to look into and report back at this session. The time was very short, inasmuch as the convention itself seemed to be utterly at sea as to what to do, and work on the committee necessarily was difficult. On that committee were Debel of Minnesota, Root of North Carolina, and myself. We have reached a report; we are not all satisfied with it ourselves, but we think it is the best that can be done under the circumstances. I will read it, and offer it as a resolution.

REPORT OF COMMITTEE ON STATUS OF EMERGENCY RELIEF WORKERS

By **PETER J. ANGSTEN**, *Chairman*

Whereas the several State laws do not contain uniform definitions of "employment", "employee", and "employer" and

Whereas the courts of last resort in some of the States are not in agreement respecting the status of injured relief workers under their several workmen's compensation acts, your committee is of the opinion that it cannot properly make specific recommendations for the consideration of this convention. Believing, however, that relief workers should be entitled to compensation benefits, your committee is of the opinion that the subject is one for legislative action on the part of the several States, and therefore recommends that this convention go on record as favorable to legislation bringing relief workers within the purview of the workmen's compensation acts of the several States.

DISCUSSION

Mr. **GREGORY** (Ohio). Is it the sense of the committee that relief workers shall be brought in the same as other employees—on the same compensation program—or some other program arranged for them?

Mrs. **TOUSANT** (Massachusetts). May I ask if it is the opinion of the committee that each State commission present to the legislature of its own State legislation bringing these people in, if there is no other way to bring them in?

Mr. **ANGSTEN**. If it feels called upon to make some sort of recommendation, yes; if not, we have no recommendation to make. In the States of two of the members of the committee the courts held against relief workers, and in one they held for them, so the view of the committee was mixed.

Chairman **PARKS**. It is your feeling that relief workers should have compensation?

Mr. **ANGSTEN**. We feel they should be brought under the compensation laws in some way or other.

Mr. **KINGSTON** (Ontario). I wonder if the committee should not add a rider to its report dealing with the question of average wage so that legislation, if it is acted upon at all, will incorporate a basis of wages on which any compensation is to be payable—as to how it should be paid.

Chairman **PARKS**. I think you ought to leave something to the legislature.

Mr. KINGSTON. I suppose so.

Mr. BAKER (Kansas). I want to say that is a very debatable question. I personally doubt the wisdom of going on record in accordance with that motion. I have a personal feeling it is a burden on the compensation act. This is a relief proposition. I question the advisability of its being on record.

Mrs. TOUSANT. I agree heartily with Mr. Baker on the subject. I think our compensation law has placed the burden on industry of taking care of its employees in cases of accidents, and that burden is based upon a contract between the employer and employee. Emergency relief presents an entirely different proposition. I think it is a very serious problem whether we should go on record as a body, without further consideration, because of the different laws in different States respecting compensation.

Mr. ANGSTEN. In reply to that I would say that once the relationship of master and servant exists—and unless the relationship exists, your legislature will not do anything about it—if these men do the same work that other men are doing and are paid a salary, I do not see how you can escape that. If the relationship of master and servant exists it must be recognized by the commissions and by the courts.

Mr. GREGORY. I feel that possibly the resolution does not just express the intention of the commissioner from Illinois. I wonder if we might have it read.

Mr. ANGSTEN. It is very general. This is a brief résumé of the situation: In Minnesota and North Carolina the courts both decided against the proposition but on a different set of facts than those on which Illinois decided the proposition. We must be careful that the facts are the same. There are some cases where the relationship of employer and employee does exist, and on that basis I think we are safe in going ahead. We ought to have some sort of legislation.

Mr. ARMSTRONG (Nova Scotia). I wonder if it is wise for this association to go on record as recommending this motion? We are getting into hot water if we commence recommending legislation to the legislatures, and the acts which should be passed by them. We are supposed to administer the laws as we get them. This is a problem for the legislatures to look after and not for the compensation boards.

Mr. ANGSTEN. I am fully in accord with what Mr. Armstrong has said. I think it would be very unwise, as Mr. Armstrong has said, for this association to make suggestions to our legislatures with respect to these social problems.

Chairman PARKS. We adopted this resolution hurriedly with all this in it. I think we ought to reconsider it and open it up for debate. I do not think we ought to take action hurriedly.

[A motion to reconsider the vote adopting this report was seconded and carried. It was also voted that the subject be resubmitted to the committee.]

[The following report of the resolutions committee was read and adopted.]

REPORT OF RESOLUTIONS COMMITTEE

By J. DEWEY DORSETT, *Chairman*

Be it resolved, That Bulletin of the United States Bureau of Labor Statistics No. 602 be, and the same is hereby, approved as the official record of the twentieth annual convention of this association held at Chicago, Ill., September 11 to 15, 1933;

That this convention approve the American remarriage table compiled by the National Council on Compensation Insurance and that the association obtain further data on the remarriage of widows for the purpose of establishing a larger exposure;

That this convention hereby express its appreciation for the continued interest in the association of that grand old young man Hon. Ethelbert Stewart, who has at this as well as private meetings inspired us with his words of constructive criticism; and be it

Further resolved, That we appreciate the courtesies and extravagant hospitality so generously extended to the members of this convention and their families;

That in particular we thank the chairman, members, and employees of the Industrial Accident Board of the Commonwealth of Massachusetts, the Chambers of Commerce of Salem, Gloucester, Plymouth, Quincy; the Plymouth Cordage Co. of Plymouth, the Gorton-Pugh Fisheries Co. of Gloucester, the Massachusetts General Hospital, Dr. F. D. Donoghue, medical adviser of the Massachusetts Department of Industrial Accidents; all of the physicians who prepared and read papers, Ralph W. Pendleton, secretary of the Public Safety Committee; the Massachusetts State police, the local police of Boston, Quincy, and the cities and towns visited; the insurance companies, the representatives of organized labor, the employers of labor, Miss Helen C. Barry, and all others who in any way assisted to make this convention one of the best in the history of the association; and we desire to extend special thanks to Madam Secretary of Labor, Miss Frances Perkins; to His Excellency, Governor Joseph B. Ely, to Senator David Walsh, Congressman Joseph W. Martin, Jr., and Edward Hugh Lee, who represented Mayor Frederick W. Mansfield, all of whom by their presence and their excellent and timely speeches so definitely contributed to our entertainment and knowledge and so graciously acknowledged the importance of compensation laws in the program for the more complete realization of social justice now receiving such tremendous support from all classes of our people; and be it

Resolved, Whereas this association has learned with regret of the death of Hon. F. M. Williams, of Waterbury, Conn., president of this association in 1926, that the association record its deep regret that F. M. Williams has been removed from among us; and as a further indication of our sorrow be it

Further resolved, That this resolution be entered upon the minutes of this meeting; that a copy of same be sent to the Board of Compensation Commissioners of the State of Connecticut, who shall advise the family of Mr. Williams of the action of the association.

[Mr. Peter J. Angsten read the supplementary report of the committee on the status of emergency relief workers and asked that it be adopted.]

SUPPLEMENTARY REPORT OF COMMITTEE ON STATUS OF EMERGENCY RELIEF WORKERS

By PETER J. ANGSTEN, *Chairman*

Whereas the several State laws do not contain uniform definitions of "employment", "employee", and "employer", and

Whereas the courts of last resort in some of the States are not in agreement respecting the status of injured relief workers under their several workmen's compensation acts, your committee is of the opinion that it cannot properly make specific recommendations for the consideration of this convention. Believing, however, that relief workers should be entitled to compensation benefits, your committee is of the opinion that the subject is one for legislative action on the part of the several States.

DISCUSSION

Chairman PARKS. You still have that belief?

Mr. ANGSTEN. That is the belief of the committee.

[An amendment to eliminate from the report the statement as to the belief of the committee, making it read instead "believing there should be some relief", and also a motion to lay the report on the table were withdrawn.]

Chairman PARKS. I think we ought to have a debate on this thing. We will not be here for another year.

Mr. BAKER. I should like to look to this organization as authority on compensation matters. The point I make is that this question is very debatable and that we cannot, in a very short time, debate it here and come to a proper conclusion. I want it so that when it appears in the report I can say to the people in my State, here is authority on the subject matter. We have passed resolutions before. We passed one at the Buffalo convention on the question of occupational disease, and I included that in my report to the legislature. I do not want this session to so hurriedly consider matters that our resolutions will not be looked upon as final authority on the matter.

Mr. STEWART. All that this report means, and all that it says, is, that this convention does not care to ignore the fact that as a result of the present condition of things industry is shifting and that the innumerable millions which industry is not absorbing it is never going to absorb; that they are being taken up in various and devious ways through other channels—public works and public relief; and that the sound legislation of the last 40 years, including the workmen's compensation legislation, is being undermined. Somebody says the Government and the States are changing the whole trend of things, to which we have no objection, but we ask you not to forget that the old system, bad as it was, did recognize that there ought to be some system of taking care of the wives and children of injured men. If you are going to have public industry, either in the form of relief or whatever it is, all right—we are not saying anything about relief work—but do not forget that compensation to the wives and children of injured men is a part of the system which you are sapping, and we insist that you give that consideration.

Mr. DORSETT (North Carolina). I agree heartily with what Mr. Stewart has said. One morning, since I have been in your city, I walked on Boston Common, and I saw there, I suppose, 100 men apparently asleep. They had been there all night, I take it. All over this country the same situation exists. The court in my State of North Carolina, in an opinion about 2 inches long, said such folks are not employees, though they may be working for \$1 a day or \$2 a day. Such a workman may have a wife and a dozen babies, but if he is killed he is nothing. Is that the attitude that members of industrial commissions, who are interested in relieving suffering humanity, take? Is that the attitude we should take in this year of our Lord 1934? Brother Stewart, you have expressed well the thoughts I have on this subject.

Mr. BAKER. In this motion we go on record as being opposed to taking care of these injured relief workers. I think it would be the sense of this body that something should be done. My point is that it burdens the compensation act with a relief measure.

Mr. KEENER (Arizona). These people on relief work are human, the same as other employees, and subject to the risks involved in industry. In our State they are taken care of by agreement between the compensation commission and the relief board. Premiums are paid out of the funds appropriated for relief.

The report of this committee is merely for adoption and is not binding on any commission or any legislative committee. It is given to the commissions to suggest whatever legislation their own States may adopt to relieve this very embarrassing situation. It does not bind this association to anything. It recommends that the commissions try to prevail on the various legislators to adopt some legislation to take care of this situation.

Mrs. TOUSANT. The plea which Mr. Stewart made would make most any widow weep and is a very excellent thought and theory, but it seems to me that when the Federal Government says it is not going to pay compensation after May 1 that we have something greater to think about than just our present thoughts, whatever they may be. It seems proper that this convention should petition for adequate legislation in the different States to take care of the proposition which has been thrown into our laps. I should like you to think of that as a method of handling this problem.

Mr. ROOR (North Carolina). I think that the debate on the resolutions has proved one fact, and that is that the members of this committee are agreed in believing that this is a very serious question and that it has presented a very debatable matter. I think also that the debate has shown that perhaps some of you do not understand just what that resolution portends. It takes cognizance of the fact that there is no unanimity of opinion about this subject, that differences exist, perhaps not here on this floor alone, but in the courts of last resort of the several States. Therefore your committee did not have the temerity in the first resolution to suggest that this convention go on record as sponsoring any definite program. The committee expressed its own opinion to the effect that relief workers injured while employed as relief workers should receive some consideration. It then said that, in view of these matters of uncertainty, the matter is

properly a subject for legislative action; not asking that you take any definite action at all, but that you concur in the sentiment, if you will, that this is properly a subject of legislative action in the respective States. What shall be proposed in North Carolina, Massachusetts, or any other State we do not presume to indicate, let alone dictate. I cannot altogether agree with my friend Mr. Baker that if this convention votes upon the resolution it will not thereby have expressed itself as against relief. I think that when you are presented with an opportunity to sanction an expression in favor of compensation for relief workers, and vote it down, you are expressing yourself as opposed to that thing.

Mr. STEWART. Just one word more. Society, after long years of agitation and debate, decided that industry in which a man's productive labor was being exercised should have the burden of taking care of him in case he was injured, and taking care of his family and his widow. This very same society, represented by your Government, and, well, apparently represented by the N. R. A., voted that that was a proper thing for industry to do. When you get to a place where that same society, that same mass group, the whole people, has to employ the workers in some way or other and proposes to abrogate the question of taking care of injured men's families—in other words, to sneak out of what it compelled industry to do—it is becoming industry itself. Don't fool yourself about it. Industry will not and cannot and never will employ the 10 millions of persons out of work. We saw some of that yesterday. I have seen a good deal more. We heard a man say, "This used to be an immense sail loft. We had 35 men up here making sails. They put steam engines on our boats and now there is only one man hanging around this place." We saw a machine canning; we saw machines peeling potatoes; we saw machines fixing stuff in cans. The man said they were running about 25 percent of capacity. Supposing that man gets an order next Monday morning for 300 percent more output than he had last Monday morning. He will not employ another human being; he will simply speed that machine up to what it can do. That condition is everywhere. We are simply fooling ourselves when we talk about the return of the kind of prosperity which would put these men to work. Society, in some form or other, is going to employ these people; it is going to employ them on some kind of a basis. Now, are we going to sit here and let it sneak out from under the workmen's compensation law without even saying to it, Well, while you do that, you ought at least to consider doing the things that you require industry to do, to take care of those who are injured in your own work.

Mr. LEONARD (Ohio). If I were a Republican politician, I would say wait until the next Republican administration, and if I were a Democrat I would say this is because of the past Republican administration, but as I look at this, it is a matter that will be worked out. We have not yet solved the problem, but it will be solved because of the great army of widows and orphans who are under your charge. It is a big thing now; see that nothing is done which will break down the system of workmen's compensation in America.

Mr. HARTWIG (Oregon). I feel I ought to say a word or two on this subject. In Oregon we have solved the problem. The attorney

general of the State of Oregon held, after the United States Government indicated that it would not pay or continue to carry these relief workers under the United States Compensation Commission, that the political subdivisions to whom the workers were assigned were the employers. As I read the instructions from the United States Government, they require that the workers employed in the State of Oregon on relief programs be covered by compensation. The private carriers in Oregon had no desire to cover these workers. The State funds in Oregon differ from those of every other State in the Union. The employee makes a contribution to the fund of 1 cent on a dollar. In 1932 that amounted to 13.6 percent of the total contribution. In Oregon, we have not had the court's decision on the subject yet, but the attorney general held that the political subdivisions to which the workers were assigned were the employers. We solved that problem in that simple way.

I should dislike very much to see this convention take an action which might make it difficult for us in the Oregon Legislature—and the problem will unquestionably come up—to pass an expression that these relief workers are workers just the same as other employees. I am thinking now particularly of the State of Oregon. I recognize Oregon's law is perhaps unlike many other laws in this Union, but we are going to make a fight in Oregon to see that these relief workers continue under the present arrangement which we have worked out out there. I want to call your attention to this thought, which may have been overlooked: I think that the United States Government, in issuing those instructions with respect to compensation, had it in mind to make the political subdivision of the State carry a certain part of the load in caring for relief workers, and I am not at all opposed to that principle. I think we are all beginning to run too much to our central Government. It has been a wonderful thing to have it come forward and take care of the workers with these new relief programs. But now the problem is coming up in the Oregon Legislature, and I should like to see an expression indicating that the principle is sound, that relief workers should be compensated in some manner, or else that the entire subject be left alone. I feel that if the resolution is laid on the table it might be claimed in Oregon to be an adverse action on the part of this convention.

Mr. GREGORY. I feel that possibly we have become apprehensive about something we are not concerned with here. As I understand this resolution, or this report of the committee, it is that it is simply suggesting that some form of compensation be arranged for. If that is the sense of the report I do not see that we can have much objection to it. We are dealing with a live question these days, and it is going to be a live one for some time, as to whether to take these workers and cover them in under the regular workingmen's compensation. That is a question which is up to the State. This committee is simply recommending or suggesting to the respective States that they take some form of action. I do feel that it is such a live question that we should not take negative action on it. If we cannot do any more, let us accept this report and recommendation of the committee. It would be rather unwise to lay it on the table or to take some negative action on it. I do not see any danger in adopting the report. If I understand it correctly, it is simply a suggestion to the States and Prov-

inces that some formal action be taken in those places where the problem has not already been dealt with.

Chairman PARKS. I was puzzled, listening to the gentleman from the other State who talked so nicely about giving that compensation. That seems to be the usual thing to do, to talk about the widows and orphans and the poor fellow who is out of work, and all that sort of thing. I should like to join the throng and talk about that, but I am wondering who is going to pay this compensation. The gentleman from Oregon told us that in that State these men were considered employees and given compensation. Frankly, we cannot say that in Massachusetts. These workers are being hired by Federal officials to do work, and are being paid out of Federal funds. They are always under Federal jurisdiction except that they are doing something for the cities or towns, or maybe the Commonwealth at times, which are being given the money to provide sustenance for them. I am wondering, when you decide that they are entitled to compensation, just who is going to pay it. I have sympathy for them, for the whole 10 million of them. I could make a spread-eagle speech that would bring tears to your eyes, but that is not going to help.

This is a practical thing. Sometimes social workers come before me and plead that a man has tuberculosis and should get compensation, and the simple answer I sometimes give is, "Sure enough, he should get compensation. You are breaking my heart with your sad story, but he does not belong here. He belongs to your society of social workers. This is not a compensation case. Save your tears for yourself and give him the money that your organization should give him. He does not belong here. There is no way under the law that I can give him such compensation." It is much the same here. My mind goes back to when this thing started. The Federal Government solved the problem immediately. It said to pay the laborer compensation and medical attendance. We did in Massachusetts, and I presume they did in other jurisdictions. Men came to our office and wanted to know if they would get their compensation if they got hurt, and we referred them to the various post offices that were doing the work. They had to fill out certain papers, and so much was allowed for medical attendance, and all that sort of thing. We told the Federal workers that we had no jurisdiction over them whatever, and could not do anything for them. I heard that the compensation was paid, and then that a goodly number, a majority, of them who were hired in the first instance got injured in a day or two, and most of them were on compensation before a week or two had expired. The doctors were reaping a harvest collecting compensation for treating lame backs, and so forth, until the Federal Government got alarmed. It was paying out much more for compensation than it was paying for the men who were employed—that is the story I got, and I got accurate figures on it—so it decided that after May 1 it would pay no more compensation. First it decided these men were employees of the Federal Government, and having paid them it saw where it was drifting, and decided it was too expensive a proposition and shut compensation off. As Mrs. Tousant well said, we have had this in Massachusetts; they have dropped it into our laps. I did not know that in a State fund you could take money out of the fund and give it to anybody, no matter who he worked for, whether

the Federal Government or the Commonwealth. I want to have that explained before I leave here.

In Massachusetts, in order to come under the compensation act you must take out a policy of insurance, except that the Commonwealth pays compensation to laborers, workmen, or mechanics employed by the Commonwealth. The cities and towns, upon acceptance by vote of the city council or the selectmen, come under the compensation act. They do not need an insurer to pay their employees. If one of these Federal workers who is doing a Federal job under F. E. R. A., on the highway in the town of Sudbury, say, gets hurt and the legislature says he must get compensation, who is going to pay it? I am puzzled to know. The town of Sudbury immediately puts up the defense that he was not working for it. So you reach that proposition, who is going to pay him? I should like to have somebody answer that.

Mr. ANGSTEN. I think I have indicated the belief of the committee—Mr. Root and myself and Mr. Debel, of Minnesota; and to his eternal credit, notwithstanding the program as decided in his State, Mr. Debel feels the decision was wrong in that case, and Mr. Root has agreed. It is the belief of the committee that some form of compensation relief ought to be provided for these workmen. I do not claim any credit, because the supreme court of my State has said so.

Chairman PARKS. Provided by whom?

Mr. ANGSTEN. By the employer. The employer is getting these workers for nothing. These workmen do the same work that the other employees, the old employees, did. I have in mind a case in Illinois where the relief worker was supplied to the Forest Reserve. The Forest Reserve district in our State is operating under the compensation law. The men are employed cutting down trees and in work where they use sharp tools, axes, and so forth. These relief workers were doing the same things as the other employees of that park district were doing. The Forest Reserve district did not pay a dime for these workers; they were paid out of the relief fund. Now, in common justice and decency, if a man is injured while working for the Forest Reserve, and the Forest Reserve is operating under the compensation law, working in what we deem an extra hazardous line of work, the Forest Reserve must make some arrangement to take care of him. It has not paid a dime for him, but it has complete control over him and can hire and fire him, and do all the other things that make up the master-and-servant situation, and it ought to pay him.

I listened intently to the talk just now, as I did previously when the Minnesota decision came up. You said the committee ought to have knowledge enough to go out and do what it pleased. The gentleman from Minnesota did that very thing; the gentleman from North Carolina did it. I am not claiming any credit because the supreme court of our State went on record that the relationship of master and servant did exist in the Forest Reserve case. I want to give credit to these two men, Root and Debel, who spoke their convictions.

Mrs. TOUSANT. It seems to me, in analyzing the whole discussion here, that our real difficulty arises over the words "compensation relief." I believe everyone here believes that there should be some relief, financial relief, in cases of injury while at work.

Mr. ANGSTEN. During our deliberations we were approached by the Boston Legal Aid Society and asked to have something done by this convention to get some sort of a benefit through.

Mrs. TOUSANT. My objection is to the use of the word "compensation." I dislike this body to go on record to extend a compensation act to include those people, using the word "compensation." It seems to me that if we accept the recommendations of that committee we are asking the various legislatures to extend the compensation law in toto to those employees, so called, to those relief workers. It is my feeling they should be relieved, and that you either directly go on record recommending that the legislature provide some method of relief in cases of injury to these relief workers, or refrain from using the word "compensation."

Mr. WRABETZ (Wisconsin). We had considered relief workers actual employees because they were not the subjects of charity but were working for what they got, but our supreme court reversed our decision.

[On motion duly seconded and carried the report of the committee was adopted.]

Chairman PARKS. We will now hear a paper on Merit Rating, an Incentive for Accident Prevention, by E. I. Evans, actuary of the Industrial Commission of Ohio.

Merit Rating, an Incentive for Accident Prevention

By E. I. EVANS, *Actuary Industrial Commission of Ohio*

Merit rating, as used in the workmen's compensation field, covers two distinct plans of modifying the premium rate of an individual employer. Schedule merit rating is a plan based upon the principle of endeavoring to measure, through personal inspection, the safety value of mechanical and morale factors existing in an establishment, and then applying penalties for conditions likely to produce accidents, and credits for conditions likely to diminish accidents. Another plan, known as experience-merit rating, is based upon measuring the employer's accident cost record, on the theory that the accident record will reflect the value of all safety activity as well as measure other factors tending to influence the relative accident cost of an industrial establishment.

Schedule rating has not been as universally used as experience rating. Most exclusive State-fund States and the Canadian Provinces have never used schedule rating. Schedule rating has been discontinued in many States within the last year and private carriers, who were its strong proponents in the past, are now advocating its discontinuance. This paper will deal only with experience merit rating as an incentive for accident prevention.

Experience merit rating is based on the principle of providing a profit motive to the employer for eliminating accident cost. It is generally recognized that the rapid advance of industry in this country is due, in large measure, to the governmental policy of permitting liberal profit return to the leaders of industry. Can experience merit rating properly measure the results of accident prevention and reward those responsible for the effective effort

expended? If so, we must concede it to be an incentive for accident prevention.

We are all familiar with the wide fluctuation in the individual accident cost, where at one time an accident will cause no injury to employees, while at another time a similar accident may result in injury to one or a number of employees, and the extent of injury may vary from a minor cut or bruise to death or permanent total disability. The cost, from a workmen's compensation standpoint, may fluctuate from zero to thousands of dollars, and where a number of employees are injured from one mishap the cost may run into hundreds of thousands of dollars. This wide fluctuation makes necessary the use of insurance to meet the cost of accidents.

Another condition presenting itself is that individual firms vary widely as to number of employees and degree of potential hazard. The number of employees may range from one part-time employee to thousands, and hazards vary from the light clerical hazards to those found in mining, heavy manufacturing, or construction. Employers with few employees or a low hazard must have a larger measure of insurance than is necessary for employers with many employees or a high hazard.

Wage-level variations also become influencing factors in that the premium is directly affected, while only a portion of the claim cost is affected. Employee earnings are used as the base for determining compensation benefits, but wage levels do not affect medical-aid items, or compensation cost above the maximum or below the minimum weekly limits specified in most laws. An employer paying a 10 percent higher wage scale than another in the same industry would pay a 10 percent higher premium. However, the claim cost would not be 10 percent higher, as wage levels would not reflect in all the items of claim cost.

Another group of factors must be considered in analyzing accident cost. These are ones that develop subsequent to the accident, such as infection, rehabilitation, malingering, and medical cost. Infections are a major influence in cost fluctuation and should be considered as a part of accident prevention, as it is recognized that much can be done to minimize greatly the effect that infections have on cost. Rehabilitation is another factor that should be considered, as the extent of compensation cost in many claims is influenced by the ability of a crippled employee to find work suitable to his handicap. Excessive medical treatments or fees and malingering are also cost factors that should be measured in a merit-rating system.

Therefore, it would appear that in a comprehensive system of experience rating, the total cost of accidents should be used in order to include all factors of cost. However, violent fluctuation in costs would result in the premium of an employer reflecting the results of chance, for which insurance should be provided.

If we use frequency rather than cost, we do not measure the benefit of effective control of infection, rehabilitation, malingering, and medical cost, but provide an incentive for concealing minor cost cases, as a minor case would have the same influence as a major one.

If the cost is broken down into two or more divisions our problem becomes more simple. We cannot determine what portion of the cost is due to chance or what portion is within human control, but we can assign to one division the cost that is not greatly influenced by chance, for which little if any insurance need be provided, and segregate into another division that portion of cost that is largely a matter of chance and for which insurance should be provided. The greater the number of divisions into which the cost is distributed the more exacting can the experience be made to reflect cost control by an individual firm.

For example, the Ohio experience-merit rating plan provides for the distribution of cost into three divisions. In the first division is placed the initial compensation cost up to a maximum of \$500 and the initial medical cost up to a maximum of \$200 in any one claim. In the second division is placed the cost beyond the maximum limit of \$500 in compensation and \$200 in medical in any one claim. In the third division is assigned the catastrophe claim cost. A number of deaths occurring in one accident is defined as a catastrophe, the number required to qualify varying in accordance with the hazard of the industry. High-cost permanent total disability and second-injury cases resulting in permanent total disability are also assigned to the catastrophe division.

Only the first two divisions are then used in experience merit rating, the third or catastrophe division having no influence on the individual employer's rate. The claim cost assigned to the first division is known as the normal losses and that assigned to the second division is known as the excess losses. The normal losses are permitted to have a large effect upon the employer's rate, due to not being subject to wide fluctuation, as one high-cost accident has only limited influence. The excess losses are subject to a wide fluctuation from a single accident. Therefore, there is not permitted as large an influence in the modification of the rate and, if the employer has not developed a premium of \$5,000 or more, the excess losses are not used, due to the limited extent of the employer's exposure.

We therefore have three divisions into which accident cost is distributed. First, the normal cost which is permitted to have a strong influence in modifying the individual rate of an employer, while insurance has a very limited influence. Second, the excess cost which is permitted to have only a limited influence, while insurance has a large influence on the individual rate. Third, the catastrophe cost which is carried wholly by insurance and has no influence in the modification of the individual rate of an employer. Thus an employer with a total accident cost experience of \$20,000, when the expected cost for his exposure should be only \$10,000, may receive either high penalty or a high credit or neither credit nor penalty. Should the entire cost be the result of a catastrophe accident, leaving no other cost, the employer would be as one having had a perfect record and would receive a high-credit rating. If the \$20,000 cost were distributed over many accidents, no single accident exceeding the maximum limit of \$500 in compensation or \$200 in medical cost, so that the \$20,000 was wholly distributed to the first or normal division, there would be developed a very high penalty, in that the

\$20,000 would have a heavy influence on the individual rate. If the \$20,000 was the result of one noncatastrophe accident, \$700 of the cost would be distributed to the normal and \$19,300 to the excess division of the employer's experience; here, only \$700 will have a strong influence on the individual rate modification, while \$19,300 will have only a limited influence. Many other variations could develop dependent upon the number of accidents and the distribution of cost to such accidents. The plan, in effect, places upon an employer a heavy responsibility for the first \$500 of compensation and the first \$200 of medical cost in any one accident, with more limited responsibility on that part of the cost above these limits.

The extent to which the normal and excess division of cost is permitted to modify the rate is graduated, so that the experience of employers with limited exposure does not influence the rate to as great a degree as in the case of employers with broad exposure. With such a plan, it is to a considerable degree possible to measure the factors contributing to accident cost that are within human control, and to eliminate the factor of chance for which insurance must be provided.

Such a plan rewards the employer in reducing the amount of premium he is required to pay for accident protection. Should the employer be rewarded, or are there others who are more instrumental in producing effective accident prevention, for whom an incentive should be provided?

The workman, through loss of earnings in addition to pain and suffering endured, is already severely penalized for his failure to follow safe practice. Therefore, while the workman is a great factor in safety control, there is already provided a great incentive for his cooperation in preventing accidents.

The employer provides the physical plant and equipment. He selects the type of personnel and directs the mode and manner of performing the work. From an accident cause standpoint the employer is a major factor. While it may be conceded that an employer does not contribute in any measurable degree in some accidents, nevertheless he, as an employer, accepts the hazards of profit or loss that are always present in the conduct of any enterprise. Therefore, it is not unreasonable to hold him responsible, to some degree, for accidents involving his employees.

As to those factors influencing cost after an accident has occurred, I believe it can be said that the employer is also in a position to be of more assistance than anyone else except possibly the employee himself. It is not unreasonable to place upon the employer a responsibility for a high-infection frequency or for poor medical treatment. The employer's cooperation must be had in effective rehabilitation of injured workers. Malingering and excessive medical services or charges are conditions against which the employer can render very valuable assistance. Therefore, it can be said that not only is the employer in a position to be highly instrumental in producing effective accident prevention, but he can also be of great assistance in maintaining low cost after an accident has occurred.

The extent to which an employer shall be rewarded for maintaining a favorable accident-cost record should be in proportion to the employer's volume of exposure, and sufficiently high to give to such

employer a very material advantage over his competitors who develop a highly unfavorable record. However, the penalty imposed for an adverse accident cost should not be a burden that will result in the employer discontinuing business during the period for which the penalty is imposed. The use of only 1 year's record in experience merit rating makes it possible for an employer to evade the effect of an adverse record by curtailing his operations for the year his penalty is in effect. The use of a 3- to 5-year period tends to eliminate this danger, and permits of a wider span between the rates of individual employers, as well as giving a more dependable indication of the employer's individual hazard.

Experience merit rating credits and debits can be unlimited where the individual unit is large and if provision is made for catastrophe losses. If limits are imposed they should at least provide for credits as high as 50 percent for favorable records, and penalties as high as 100 percent for adverse records. Such limits would enable the employer in a \$1 base-rate classification with a good accident-cost record to receive an individual rate of 50 cents, while another employer in the same class, with a sufficiently adverse experience, would receive a rate of \$2, thus developing a ratio of 1 to 4 in favor of the employer developing effective accident-cost control.

Self-insurance, where no reinsurance is permitted, is a 100 percent experience-merit rating plan. The interest shown by self-insurers gives evidence of the influence the profit motive has in promoting effective accident prevention.

While experience merit rating can be made to be effective as an incentive for safety with large employers, it does not solve the problem with small employers. Experience merit rating does not apply to employers with a 5-year premium exposure below \$100 in Ohio, below \$500 in New York, below \$1,000 in Pennsylvania, and below \$600 in a large number of the States where the National Council plan is used. The expense of applying experience rating, as well as the difficulty of giving any appreciable weight to limited exposure, has resulted in the plan not being applied to the small employer.

We can sum up by stating that experience merit rating measures the results attained, rather than results contemplated, by an accident-prevention activity, thereby requiring that the safety program must be effective in order to merit consideration, that the individual employer can adopt safety without waiting for others in his industry, and receive a commensurate reward. A comprehensive experience-merit rating plan brings before the individual employer in concrete form the proposition—prevent accidents or pay. Therefore, experience merit rating is an incentive for accident prevention.

DISCUSSION

Mr. WRABETZ. The work of Mr. Evans, actuary of the Industrial Commission of Ohio, who has served as consulting actuary in compensation matters in many parts of this country and in some foreign countries, needs no review before this meeting.

Mr. Evans has presented in simple terms how experience merit rating functions as an incentive for accident prevention. The application of experience rating and the variations in the basic ideas of

the plan, which may be used to advantage under various systems of insurance for workmen's compensation, have not been covered by Mr. Evans. Perhaps that is a detail for individual States but it would be interesting to have Mr. Evans give us the benefit of his opinions with regard to experience rating as applied to various systems in another paper some other year.

In Wisconsin we operate both a schedule-merit rating plan and an experience-merit rating plan. The schedule-merit rating plan is applied to the larger employers who are eligible for such merit rating under the rules. In view of the increased credibility of the employers' own experience in the case of the employer having a large pay roll, it seems that schedule merit rating might well be dropped entirely, since experience merit rating will very clearly reflect the employer's success in the prevention of accidents among his own employees.

In our State, under our system of compensation insurance furnished by commercial companies, it would not be difficult to introduce a variation in experience rating under which the employer would pay a premium based on manual rates and be called upon for an additional payment to cover the amount of the debit charge on account of his experience rating, or under which a check representing the amount of the credit earned by the employer because of his favorable accident loss ratio would be sent to the employer. My thought is that if the debit and credit charges on account of experience rating could be handled as a separate and distinct transaction, it certainly would be more impressive to the employer, calling his attention more forcibly to what his safety activity or lack of safety activity either is actually saving him or causing him to pay.

In this connection, it may be of interest to call attention to a kind of merit application which has operated as an incentive for accident prevention but which does not reflect itself in insurance premiums. In Wisconsin, as well as in some other States, an employer is required to pay additional compensation if the injury is caused by a failure to comply with the provisions of the safety code. The history in Wisconsin shows that point-of-operation machine accidents have decreased from 33 percent of all accidents to 13 percent. In cases of this kind the obligation to pay additional insurance is a forcible argument for proper guarding and the institution of ample safety measures and organization.

Mr. Evans did not go into detail as to the number of years' experience which should be used for experience rating. Furthermore, there are questions as to the weight to be assigned to comparatively recent experience as compared with old experience. It is true that the National Council on Workmen's Compensation Insurance has passed on these questions, but we are not always certain as to whether the recommendations of the National Council are justified. It must be remembered that the National Council represents the commercial insurance carrier and does not assume the role of an independent adviser or counsel.

Within the last 6 or 8 years the National Council has varied its recommendations for the actual revision of compensation premium rates both as regards the number of years of experience to be con-

sidered and the treatment of the experience. Experience merit rating as a complete plan may be operated regardless of the procedures employed in the revision of rate levels and rates, but the end result affecting the individual employer is the product of the application of the experience rating plan to the premium rates established. Because of the interrelationship in this matter, anyone interested in experience merit rating is also interested in the rate-making procedure generally.

Mr. Evans' paper is of such singular clarity regarding the fundamentals of experience merit rating that he should be complimented for his contribution to the literature on the subject. Notwithstanding the brevity of his paper, it covers the principles of experience merit rating from the standpoint of the employer, the insurance carrier and the public, and, last but not least, from the standpoint of the workman, for whom the incentive for accident prevention is justified.

Mr. WEEKS (New Jersey). I want to correct a statement made at the opening session, and I should like to place it on record.

Since rendering my report as chairman of your electrical committee I have thoroughly investigated the facts in connection with the activities mentioned in the report concerning the desires of several groups to obtain control of the development of the national electrical code. Fearing that my report might be misunderstood, particularly as to the relationship of the American Standards Association to these alleged activities, I desire to supplement my report with the following facts:

Neither the American Standards Association, nor its chairman, Mr. Agnew, nor its secretary, Mr. Ainsworth, had any connection with or knowledge of the conferences that were being held relative to some electrical standardization projects, and the proposals which have been complained of were never brought before the American Standards Association in any way.

Because of these facts and because of the service which the A. S. A. has rendered to this association toward insuring that its interests were fully protected, it should be understood that your committee did not intend in any way to reflect upon the policies, methods of operation, or activities of the A. S. A.

On the contrary, while it is desirable that you continue your electrical committee in order that your association can be thoroughly represented and its interests adequately protected in all electrical standardization work in which it is interested, it should be understood that under the procedures of the American Standards Association this association can always have its day in court. Such activities of commercial or other groups concerning which we have complained must run the gauntlet of scrutiny of the A. S. A. before becoming effective, and during that process governmental and public groups such as ours can be assured of full opportunity to have our objections or points of view considered. The members of the I. A. I. A. B. C. should recognize in the A. S. A. an avenue for asserting its points of view on national problems of this kind and should try more effectively to use its facilities.

In order that your electrical committee may be empowered to take such steps as may be necessary to insure adequate consideration of

the point of view of the industrial accident boards and commissions, it offers the following resolution :

Resolved, That the electrical committee of the I. A. I. A. B. C. is empowered to secure such representation on electrical committees on which it is not now represented and the work of which is of interest to this association, and to secure additional representation on such committees of which the association is now a member and which additional representation in the minds of the committee seems essential to protect the interests of this association.

I might say the reason for bringing that up is the fact, as I stated in my report, that secret meetings are going on over the States to offset the national electrical code, and that we should have a representative at each place in order to protect our interests. I think we ought to be in on the ground floor of every committee that has anything to do with any of the changes or any suggestions of any methods that might harm our interests. I submit this to be placed on the records.

[The report of the committee and the resolution were accepted.]

[The new officers were installed and J. Dewey Dorsett, the new president, expressed his appreciation of the honor conferred on him and his determination to work for the largest representative attendance at the next convention, to be held at Asheville, N. C., September 30 to October 3, 1935, that there had been since 1929.]

[Meeting adjourned.]

THURSDAY SEPTEMBER 27—AFTERNOON SESSION

Joint Session of I. A. I. A. B. C. and I. A. G. L. O.

Chairman, THOMAS P. KEARNS, Superintendent Division of Safety and Hygiene, Department of Industrial Relations of Ohio

Chairman KEARNS. It is a privilege to preside at this joint session of the International Association of Industrial Accident Boards and Commissions and the International Association of Governmental Labor Officials, which is held for the purpose of discussing safety and accident prevention, a subject which is very near to my heart. It is fitting and appropriate that these two organizations should meet in a joint session to discuss problems of safety and accident prevention, because, after all, the primary object and the fundamental aims and purposes of both organizations may be summed up, I think, in the phrase "accident prevention", or work to prevent the toll of life and limb that is being taken through industrial accidents and occupational diseases.

The first speaker on the program this afternoon is a man who has had a wide and varied experience in accident-prevention work. He has been, I understand, the director of inspection in the New York Department of Labor for a period of at least 20 years. He has had a very wide experience and has been doing a very constructive piece of work for the department of labor as the director of inspection. I take great pleasure at this time in introducing to you Mr. James L. Gernon, who will discuss Progress Made in the Prevention of Industrial Injuries.

Progress Made in the Prevention of Industrial Injuries

By JAMES L. GERNO, *Director of Division of Inspection, Department of Labor, New York*

In presenting this paper it may be advisable to state that part of it is based on information obtained from a recent examination I personally made of 115,000 employers' reports of industrial injuries furnished to the Commissioner of Labor of New York State, as required by the compensation law of the State. For several years we have been furnishing inspectors in New York State with photostatic copies of the employers' reports of industrial injuries, with the purpose of providing the inspectors with knowledge of the injuries occurring in the establishments they are responsible for inspecting. This enables the inspector to know the number, frequency, and character of the injuries reported for a certain establishment, and enables him intelligently to aid the employers in preventing a recurrence of the injury, if it is possible to do so, by the installation of proper safeguards or by discontinuing unsafe practices.

In order to know the full value of the information these reports would furnish for inspection work, I imposed upon myself the task

of reading them. This entailed a great amount of additional work for which I have been fully repaid, for in examining these reports I have confirmed my own theories as to the causes of many industrial injuries, which theories were the natural result of many years of contact with State inspection of industries and the prevention of industrial injuries.

Those of us who can recall industrial conditions existing 25 years ago have seen the transformation that has taken place as to methods of manufacturing, and the development of legislation governing industry, and in the light of what has happened it is reasonable to assume that the end of this advance has not yet been reached.

While progress in industrial legislation has been advancing slowly in many States, we should not lose sight of the fact that in a number of States little progress has been made, and that even in the States with the most advanced industrial regulations there is still necessity for considerable improvement if we hope to prevent or reduce industrial injuries to the lowest possible number.

Modern industrial management realizes that a human being, so necessary to the proper conduct of industry even in this so-called "machine age", is entitled to healthful and safe conditions in the pursuit of his daily labor.

In the old order of industry the workers assumed the risk and carried all the financial burdens resulting from unhealthful or unsafe conditions in industry, in addition to the physical suffering and handicap incident thereto. Many States have changed this in a degree by providing for compensation awards which pay for a portion of the loss suffered by those injured in the course of their employment. Even in the new order of things the worker still suffers much of the financial loss and endures the physical handicap of industrial injuries.

The injustice of the old order of things was generally condemned, because most of our people in and out of industry realized that these industrial injuries were in a very large measure preventable. This being so, they imposed a tremendous unnecessary financial loss, as well as suffering and handicap, on those injured.

These changes in public opinion 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—a period that has been termed the "machine age" because more work is done by the use of machines and power than at any other time in the world's history. And today there are those who claim machinery is displacing labor in industry. Regardless of how efficient these machines may be, they are of little use without human operators. Whether machinery is displacing labor to its detriment may be a debatable question.

It cannot be disputed, however, that in most instances modern machinery has greatly speeded up production, not alone at the machine itself but all along the line of production, in numerous industries. This speed requires greater dexterity, as well as physical fitness, on the part of the machine or line operators, and makes it necessary that there be a proper lay-out and arrangement of the machine or production line properly to protect employees from injury.

Inspection of industrial plants can and has improved working conditions to a high degree where the laws are adequate to cover industrial conditions as they exist today. However, inspections alone will not accomplish all that should be done.

To reduce industrial injuries there must be adequate legislative regulations empowering State departments further to protect workers. There should be other means than the mere providing of safeguards for machinery or other hazardous conditions. Statistical records show that most of the industrial injuries are due to other causes than machinery or apparatus. Most of them will be found in several groups of work over which the labor laws fail to provide requirements which would tend to reduce the number or correct the conditions which cause the injury. Ample authority is necessary to prevent manufacturing in inadequate floor areas, causing the improper placing and spacing of machinery, equipment, and material. These conditions are the basic cause of many industrial injuries.

Nothing demonstrates more forcefully the necessity and value of inspection of industrial establishments than the hundreds of millions of dollars paid annually in the United States as compensation awards for industrial injuries, and the fact that these payments are but a small portion of the loss caused by these injuries.

Employers and insurance carriers complain of the cost of awards for industrial injuries. Can they contemplate how much larger the cost would be if there were no State regulations and inspections to make working places safe in order to prevent injuries?

We can record the number and figure the cost of industrial injuries reported to State boards or commissions. It is unfortunate, however, that it is impossible to record the number, or even estimate the saving in money value, of the industrial injuries prevented by the inspection of industrial establishments.

While the aggregate payments for compensation are large, they in no adequate degree compensate those unfortunate enough to be injured during the course of their employment. No matter how briefly or extensively we examine into the application or administration of compensation laws as to how satisfactorily they recompense those injured in industry, we are confronted with the realization that prevention of industrial injuries is of more importance than the payment of compensation for such injuries, subject as such awards and payments are to delay even under the best workmen's compensation laws efficiently administered.

The type of industrial inspection of which I speak means, not alone the prevention of industrial injuries by the installation of high standard safeguards, but the construction of new machinery by the manufacturer so that the hazard of operation is eliminated as far as possible; the providing of sufficient floor space properly to locate machinery, equipment, and material, so as to minimize the possibility of injury in hazardous operations; the installation of equipment and apparatus for the protection and preservation of the health and comfort of those employed, such as the maintenance of proper temperature and humidity, and the removal of injurious dust, gases, fumes, etc.

After all of these things have been done, there would still remain the onerous task of advising the owners and managements of industries of the necessity of properly instructing or teaching their employees how to perform their work safely. It requires only a casual examination of several hundred employers' reports of injuries, furnished in connection with compensation claims, to convince anyone who has a fair industrial knowledge that too large a percentage of

industrial injuries result from the inability of the worker to use the human body properly in the performance of his work, or the lack of knowledge as to how to perform his task properly and safely.

It is becoming more evident each day that if we hope to protect workers from injuries in our industries as conducted at present, the industries should be required to teach their employees how to work safely, which means efficiently. This includes teaching them to use the human body as nature intended. This policy will have to be adopted and applied before we may hope to eliminate the larger proportion of industrial injuries which result from other causes than unsafe machinery or apparatus, equipment, or structural conditions. Many injuries are the result of human failure, industrial inexperience, inadequate strength or fatigue, and it is in these groups of causes of injuries that owners and managers of industrial establishments are inclined to attribute the injuries to the carelessness of the employee.

When we approach the work of prevention of industrial injuries in this manner we can expect to accomplish what is most desirous—the prevention of much of the misery and suffering resulting therefrom, as well as the reduction of the appalling number and excessive cost of industrial injuries in the United States.

It would be well at this point to realize that many industrial establishments are not as efficiently equipped or conducted as competently as many of us may imagine. In all lines of industry there are what may be considered high standard plants or establishments, but they are few compared with the whole number of plants both large and small in the same line of industry. It is well to bear in mind that these plants decline by degrees from the highest standard to the poorest type. When we speak of "high standard" we mean a plant with proper working conditions, instruction of employees in the correct method of performing work, and with a low record of injuries compared to the hazard of the particular industry and the man-hours worked in the various hazards of the establishment.

The industrial inspection force of any State can substantiate the fact that there are far too many industrial plants that either disregard the common principles of safety, or fail utterly to conduct the manufacturing operation so as to promote safety or protect their employees from injury.

For the past 20 years there has been progressive development in most of the States in workmen's compensation provisions, and it naturally follows that some States have better compensation laws than others. While this development of the compensation law has been going on, no State has increased its force of inspectors or developed its inspection work, which means the prevention and reduction in number of industrial injuries, in any measure or degree comparable to the increase in the number of industrial injuries or the increase in the cost of compensation awards.

Most of the States from time to time add some good provision of law for the protection of employees without making any or adequate provision for additional inspectors to enforce the added provisions. These measures may in themselves be admirable, but without proper enforcement they are of no value. The duty of enforcement then falls on an already overburdened inspection division with an already inadequate number of inspectors.

Many times these beneficial provisions of the labor laws are enacted so legislators may receive credit for the enactment, or they are passed to appease the public demand for such legislation. In many instances legislators willfully fail to provide additional inspectors for proper enforcement.

The time has arrived when State departments should take proper measures to increase their inspection force to an adequate number properly to promote the prevention of industrial injuries. In doing this the increase in the force should be in fair proportion to the many millions of dollars paid annually for compensation awards for industrial injuries. I am not advocating the enlargement or development of inspection of industrial plants so that there may be more jobs, or that industry may be harassed by inspectors who might do this work in a perfunctory manner. I am advocating this as a practical measure for saving many thousands of employees from injury, and reducing by many millions of dollars the cost of awards for compensation.

The management of any plant who is really sold on safety is usually ready to welcome a trained inspector, experienced in his work. The efficient plant owner or manager will know that the orders or advice given by such an inspector are necessary and practical in improving health conditions or preventing injuries. Where the management disapproves of inspection of the plant, it is generally the place where inspection is most necessary.

It may be that in times such as the present, owners will experience difficulty in finding money to make the necessary changes, but when business conditions are normal, it is not as difficult as many may suppose for State inspectors to secure improved conditions in industrial establishments, provided there is on the part of State authorities a reasonable but determined intent to enforce the provisions of law. There is always a certain percentage of employers who will do nothing to comply with the requirements of the law until forced to do so by the State authorities. It is a sad commentary on industrial owners and managements that a large percentage do not know what to do relative to promoting the health of their employees, and preventing injuries incident to the industry in which they are engaged, until they are shown what to do by those responsible for enforcing the requirements.

Regardless of whether an industrial establishment is making or losing money, we have advanced too far for those conducting industrial establishments not to realize that the policy is firmly established that they have no right to conduct an industry so as to subject employees to health hazards or industrial injuries. The employer is entitled to the profits that may accrue from his enterprise, but there is every reason for him so to equip and conduct his establishment that the employees are protected, and not subjected to industrial hazards incident to the industry.

If there is a real desire to prevent industrial injuries it can be done by preventing avoidable injuries which consist in the main of happenings which are unnecessary, and by the application of intelligent effort on the part of industry properly directed by the inspection division of a State department.

Due to lack of time it is not possible to outline here the details of such inspection method, but at this time permit me briefly to outline

just one phase of safety work that might be accomplished if we had an inspection force of sufficient number to do the work necessary.

For this purpose we will use the tables prepared by the statistical division of the New York State Department of Labor of closed compensation cases for the year 1933, showing the cause of the injury, the number, the cost per case, and the aggregate cost of each group of injuries, and also the number of death and permanent total, permanent partial, and temporary cases.

These New York figures will illustrate the conditions in any other State in proportion to the industries existing in each State, for what is happening in New York State is also happening in the other States in a greater or lesser degree in comparison with the number and type of industries in the State.

There is considerable significance in these figures when carefully analyzed with a full knowledge of what is occurring in our industrial establishments.

These statistical tables of closed compensated cases in New York State for the year 1933 indicate clearly that the group of injuries due to "Handling objects and tools" is the greatest in number of cases and second in total cost of compensation. The group "Falls of workers" is second in number of cases but first in total cost of compensation. The group "Mechanical apparatus", including elevators, hoists, and conveyors, is third in number of cases but fourth in the cost of compensation. Mechanical apparatus is responsible for 12 percent of the total number of cases and 13 percent of the total cost of compensation paid to claimants. When we compare the number of cases due to mechanical apparatus with those due to falls of workers, we learn that falls were responsible for over 20 percent of the total number of cases, and over 28 percent of the total cost of compensation paid.

Suppose we make another comparison with the injuries caused by "Mechanical apparatus", in which group we should bear in mind is included the injuries due to elevators, hoists, and conveyors used in the largest industrial State, with the four groups, "Handling objects and tools", "Falls of workers", "Falling objects", "Stepping on or striking objects"; we find these four groups of cases are responsible for over 68 percent of the total number of cases and over 59 percent of the total cost of compensation paid. If we can realize the vast amount of machinery and apparatus used in the industries of New York State and the speed with which many of our industries operate, we may be able to imagine how necessary it is for the machine operators to be possessed of acumen and adroitness to perform their work safely.

We have made headway in making machinery reasonably safe for employees. We have not accomplished all that is necessary or desired; more will be accomplished when State legislators see the light, and learn that prevention of industrial injuries would be far better for those injured, for industry, the public, and the State, than the payment of compensation, regardless of how generous the awards may be or how expeditiously the awards are paid.

It would be reasonable to suppose that in an industrial State machinery would cause more injuries and cost more money than those in any other group. A large number of people in and out of industry

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NUMBER AND COST OF COMPENSATED ACCIDENTS IN NEW YORK STATE, BY CHIEF CAUSES—CASES CLOSED IN 1933

[Prepared by division of statistics and information, New York State Department of Labor]

Cause of accidents	Total cases					Death and permanent total			
	Total number of cases	Total compensation ¹	Total weeks ¹	Average compensation per case	Average weeks per case	Total number of cases ²	Total compensation	Total weeks	Average compensation per case
Handling objects and tools.....	27,320	\$5,392,165	381,742	\$197	14	(24) 95	\$952,736	95,000	\$10,029
Handling objects.....	21,516	4,266,930	301,657	198	14	(21) 76	786,508	76,000	10,349
Using hand tools.....	5,804	1,125,235	80,085	194	14	(3) 19	166,228	19,000	8,749
Falls of workers.....	16,227	7,120,882	563,737	439	35	(47) 227	1,749,641	227,000	7,708
Falls to a different level.....	7,538	4,571,174	371,775	606	49	(33) 175	1,354,573	175,000	7,740
Falls on the same level.....	8,689	2,549,708	191,962	293	22	(14) 52	395,068	52,000	7,597
Mechanical apparatus.....	9,031	3,422,979	284,020	379	31	(15) 107	745,550	107,000	6,968
Machinery, prime movers, etc.....	7,658	2,244,001	165,410	293	22	(5) 32	269,493	32,000	8,109
Elevators, hoists, and conveyors.....	1,373	1,178,978	118,610	859	86	(10) 75	486,067	75,000	6,481
Vehicles.....	7,043	3,959,967	397,433	562	56	(28) 254	1,623,447	254,000	6,392
Falling objects.....	3,634	1,554,324	133,878	436	38	(14) 71	579,502	71,000	8,162
Dangerous and harmful substances.....	4,113	1,424,706	141,129	346	34	(9) 98	747,118	98,000	7,624
Electricity, explosives, heat, etc.....	2,670	998,732	106,030	374	40	(5) 79	567,658	79,000	7,186
Harmful substances.....	1,443	426,064	35,099	295	24	(4) 19	179,460	19,000	9,445
Stepping on and striking objects.....	3,716	588,259	46,487	158	13	(2) 17	120,387	17,000	7,082
Other and indefinite.....	3,473	1,210,837	110,333	349	32	(9) 61	468,794	61,000	7,685
Total, all causes.....	74,487	24,674,209	2,058,759	331	28	(148) 930	6,987,205	930,000	7,513

Cause of accidents	Permanent partial					Temporary				
	Total number of cases	Total compensation ¹	Total weeks ¹	Average compensation per case	Average weeks per case	Total number of cases	Total compensation	Total weeks	Average compensation per case	Average weeks per case
Handling objects and tools.....	4,684	\$2,396,939	148,949	\$512	32	22,541	\$2,042,490	137,793	\$91	6
Handling objects.....	3,311	1,666,660	103,024	503	31	18,129	1,813,762	122,633	100	7
Using hand tools.....	1,373	730,279	45,925	532	33	4,412	228,728	15,160	52	3
Falls of workers.....	3,036	3,383,710	200,778	1,115	66	12,964	1,987,531	135,959	153	10
Falls to a different level.....	1,584	2,099,196	121,784	1,325	77	5,779	1,117,405	74,991	193	13
Falls on the same level.....	1,452	1,284,514	78,994	885	64	7,185	870,126	60,968	121	8
Mechanical apparatus.....	3,253	2,230,217	144,196	686	44	5,671	447,182	32,824	79	6
Machinery, prime movers, etc.....	2,675	1,697,918	112,143	635	42	4,951	286,590	21,267	58	4
Elevators, hoists, and conveyors.....	578	532,299	32,053	921	55	720	160,592	11,557	223	16
Vehicles.....	1,744	1,696,585	92,628	915	53	5,045	739,935	50,805	147	10
Falling objects.....	871	610,040	31,593	586	36	2,622	404,782	31,286	177	12
Dangerous and harmful substances.....	364	380,232	23,181	1,045	64	3,651	297,446	19,948	81	5
Electricity, explosives, heat, etc.....	292	272,503	16,711	933	57	2,299	158,572	10,319	69	4
Harmful substances.....	72	107,729	6,470	1,496	90	1,352	138,875	9,629	103	7
Stepping on and striking objects.....	445	243,948	14,637	548	33	3,254	223,924	14,850	69	5
Other and indefinite.....	737	473,539	80,290	643	41	2,676	268,504	19,043	100	7
Total, all causes.....	15,134	11,215,210	686,252	741	45	58,423	6,471,794	442,507	111	8

¹ Includes the standard weighting of 1,000 weeks and the estimated present value for each death and permanent total disability case.

² Figures in parentheses show the number of permanent total disability cases included.

are unable to conceive that "Falls of workers" in industry, which is the second highest group in total number of cases and the high group in cost of compensation paid, is a far greater menace to those in industry than all the machinery, elevators, hoists, or conveyors in all the industrial establishments of the State.

Again, if we consider the four groups—namely, "Handling objects and tools", "Falls of workers", "Falling objects", and "Slipping on and striking objects"—which combined are responsible for over 68 percent of the total number of cases and over 59 percent of the total cost of compensation paid, these four groups include industrial tasks and occupations many of which are difficult to safeguard, if not, in some instances, impossible to do so. In other words, these groups include work and operations where the employees must be taught the proper method of performing the work, and this instruction should include not alone the tasks the operator is engaged to do but also the proper use of the human body to perform the tasks in order to protect him from injury. Many of the injuries in these four groups are the result of the employee's inability to coordinate his body movements to accomplish his work without injury. Far too many men are placed at difficult and hazardous tasks in industry without proper instruction by the management, and because of lack of knowledge of the work, or the requisite strength or skill to perform the task for a number of hours, injury results.

Speed in the operation of machines or in industrial operations may be advisable and perfectly proper, but there is a limit to human endurance. When employees have to use normal body movements to perform their work and keep pace with high-speed machines or industrial operations, movements of the body must be made correctly, and where such condition exists it is the management's obligation to see that the machines, equipment, and operating floor space are properly arranged and maintained for the protection of employees.

Industrial inspection work of State departments has made real headway as to safeguarding machinery and other unsafe conditions where they have laws which cover the hazards of industry, and they have made this headway even with the handicap, in most instances, of an inadequate inspection force. With proper regulation and an ample force of inspectors a far greater reduction in industrial injuries could be made. What means have we at our command today in any State properly to teach industry and its management the way in which they should proceed to prevent the injuries in the four groups which in New York State are causing 68 percent of the total number of closed cases and 59 percent of the total cost of compensation paid? It is well to bear in mind that in these four groups most of the injuries cannot be prevented by installing safeguards, but the reduction must be the result of proper knowledge of the operations, the correct use of the human body, and the exercise of diligent care on the part of the workers.

Some State departments have the authority to correct the unsafe conditions of floors, walkways, and stairways. Our examination of 115,000 employers' reports of industrial injuries in New York State reveals that a very large percentage of these falls occur where there are no defective floor surfaces or stairways. These reports as submitted show in a large number of instances that there is no other reason for the falls but the physical inability of the workers to main-

tain a proper poise or body balance, and much of this is due to the inability of a very large percentage of our people to use their feet or legs in a proper way to travel safely on a floor or stairway. Incidentally, we might say industrial injuries result in a large degree from the failure of the human body to function efficiently or properly in performing the various movements necessary in industry.

The New York State record of closed compensated cases for the year 1933 gives sufficient proof that this is so. If we consider "Falls of workers", we find there were 16,227 cases divided as follows: 7,538 "Falls from different levels"; 8,689 "Falls on same level." Over 53 percent of the total number were on a level surface.

The human body as a whole when functioning properly is a complete demonstration of balanced mechanism, more marvelous and more delicately stabilized and coordinated than the finest watch or machine. This is especially true of the human foot as a part of this wonderful body. The watch or machine performs merely the same movement again and again, while the human body, and particularly the foot, must perform thousands of varied actions or movements, each requiring an instantaneous adjustment of the entire mechanism, and must do this in many instances under tremendous stress.

The human body is out of all proportion architecturally to the narrow base formed by the feet. Equipoise depends upon the perfect coordination of the nerves and muscles, and the correct control of the lever-like bones, fulcrums, and shifting surfaces of the feet.

Unbalanced feet means unbalanced postures which usually result in falls.

Leading podiatrists of this country claim that 3 persons out of 5 in the United States suffer from some form of foot trouble. Leading oculists of this country claim that only 10 percent of our people have normal eyesight. If these estimates of the infirmities of our people are correct, then we must admit that those employed in our industries are working under a severe handicap. Regardless of the correctness of the estimates of the infirmities of our people, we must realize that many industrial injuries result from one or the other, or both, infirmities.

You may have noticed that I have not referred in this paper to industrial accidents. Most of the occurrences where workers are injured are not accidents; they are sure to happen if many of the practices and methods employed or permitted in many industries are continued. We may marvel that they do not occur more frequently than they do.

Industry should be responsible for teaching the art or technique of performing the work of the particular industry. It is clearly evident from the records of injuries that most of them are not caused by machinery, but are in other groups of causes of injury. It is to these groups that intelligent prevention efforts can be applied. The inspection division of a State department can be of great assistance to the employers in pointing out just what is happening in their establishments, and how the recurrence of injuries may be avoided. What is needed is an inspection force of adequate number to assume the additional work it would impose on the inspection force of a State department of labor.

I realize that I have given here but a brief outline of the kind of prevention work we will have to do in the near future if we intend to reduce the havoc caused by industrial injuries. Brief as is this outline, I trust enough has been said to cause helpful discussion.

DISCUSSION

Chairman KEARNS. Is there anyone who wishes to discuss Mr. Gernon's paper? I am sure if you want to ask any questions he will be very glad to answer them.

Miss JOHNSON (New Hampshire). I should like to ask Mr. Gernon if the classes of major causes of accidents which he mentioned have been arranged or analyzed in the order of severity of accidents—for instance, with regard to the incidence of fatal accidents and total and permanent partial disability?

Chairman KEARNS. Will you answer that question, Mr. Gernon?

Mr. GERNON. The table submitted with this paper tells the whole story. It tells just what is happening in each group—how much the cost was and what was the result in different classifications of the industry. The cost of industrial accidents are entirely too high. There is no question about that.

I should like to leave just one thought with you which may be beneficial. I have stated on many occasions in New York that if the New York Legislature would give us \$2,000,000 and allow us 2 years in which to do it, I would guarantee to take \$10,000,000 from the cost of compensation or they could shoot me. You cannot sell that to the legislature as a business proposition. Anybody could do that if he had the money and an ample force to make the best kind of inspections. We are now making the best kind of inspections that can be made with the force we are given. In some places our laws are not adequate, and sometimes our rules are worse than the laws. The fact is we have not enough people to do the work.

Quite commonly, in gatherings of this kind, somebody tries to convey the impression that the large industries are all right. Now, in order to cause discussion, I am going to say that the large industries are no better than the small ones, in proportion. There are a good many people in industry who do not know how to conduct industry safely. We have large plants that go far beyond the law and do everything that is humanly possible, and we have large ones that do practically nothing. We have small ones that accomplish the same results as the best of the large ones, and we have too many of the small ones that do not do much, and of course, we have too many of them that do only what they are forced to do. I do not believe that we can go on with present methods and accomplish much better results. Compensation has been established long enough—almost a quarter of a century—and we cannot go on killing and injuring and maiming so great a number of people without doing the other thing; that is, prevention by improving conditions.

Chairman KEARNS. Is your question answered?

Miss JOHNSON. I did not make my question entirely clear. It was not in regard to cost. Mr. Gernon gave a very interesting account of the major causes of accidents, as I understood, from the point of

view of number of accidents under each cause of accident, and my question was what the order of importance would be if analyzed in the matter of severity. For instance, would the matter of falls be the most important in the case of fatal accidents and in the case of permanent total and permanent partial disability?

Mr. GERNON. It costs more money for fatal falls than for any other group. I did misunderstand Miss Johnson's question. If Miss Johnson wants to know if we are considering what would prevent this, we do know why these falls occur and what is causing them. It is nothing new but it is not generally known. It is remarkable how ignorant the average manufacturer is as to the falls that are occurring in his industry.

Mr. PENDLETON (Massachusetts). I should like to ask Mr. Gernon if in the State of New York the injured employee receives a copy of the accident report and if it would not help somewhat if he did?

Mr. GERNON. In answer to that let me say this: I have read a lot more than 115,000 reports—I made a mistake in that figure. But the fact is this: As you read these reports they tell you, for instance, that the employee fell downstairs. They do not tell you why he fell downstairs. Probably they do not know. People fall downstairs for many reasons. The leading podiatrists in the country are making a study of one part of the human body, the foot, and they tell us why. The fact is that there are very few people who walk correctly. I have said—I have preached it until I am tired of listening to myself—that people in industry today do not know how to sit, stand, or walk correctly, and consequently, considering industry as a whole—all the varied industries—they are subject to an awful lot of hazards. The figures from New York as to falls are high, and the figures from almost any industrial State will show up the same. Forty-four per cent of the people who are killed in homes are killed by falling. There are only 1,000 fewer people killed in homes than are killed by automobiles. From any angle we approach this we show that falls do not occur in industry alone. They occur on the highway, in public buildings, and in homes, proving conclusively it is not the people in industry or the industry alone, but also the conditions they meet, which are responsible. Mind you, there are enough conditions under which people fall in industry, and a good deal of the falling is due to human conditions.

Chairman KEARNS. Is there any other question?

Mr. PENDLETON. The question I submitted to Mr. Gernon was not answered. Does the injured employee in New York State receive a copy of the report?

Chairman KEARNS. And will you answer that direct, Mr. Gernon?

Mr. GERNON. I presume he does not, unless he sees the report at a compensation hearing of his case.

Mr. PENDLETON. Thank you.

Chairman KEARNS. It has been said that accident statistics are just as essential in accident-prevention work as a diagnosis is to a doctor in the treatment of his patient, and I subscribe to that theory. We in Ohio have found accident statistics of incalculable value in the carrying on of our safety work, and I think that is true in the other

States. The more complete and comprehensive these reports can be made, the more valuable they are in the matter of promoting accident-prevention work.

We are fortunate today in having with us a man from the United States Bureau of Labor Statistics who has had a number of years of experience in statistical work, and is thoroughly familiar with statistical procedure and the relation of statistics to accident-prevention work, and that is the subject which has been assigned to him for this meeting. I take very great pleasure in presenting Mr. Sidney W. Wilcox, of the United States Bureau of Labor Statistics.

Statistics in the Service of Accident Prevention

By *SIDNEY W. WILCOX, Chief Statistician, United States Bureau of Labor Statistics*

From the chairman's very kind introduction I judge that in his mind statistics should be partly chauffeur and partly speedometer, a guide to action as well as a record of action, not merely official score-keeper but one of the players. Having the chairman steal your thunder is one of the accidents that ought to be prevented. The program committee, however, has apparently a healthy skepticism concerning the role of statistics. I note that it has changed my wording, "Statistics in the Service of Accident Prevention" to the more noncommittal, "Statistical Work and Its Relation to the Prevention of Industrial Injury."

An illustration gathered from my New York State experience will clarify the issue. Commissioner Perkins made an important change in the interplay of the statistical work and the factory inspection work. It became the duty of a special statistical unit to provide the inspectors with photostatic or other copies of that part of the compensation division's accident reports which would acquaint the inspector before he visited a plant with the accidents which had taken place during the past year. He entered the plant with the story in his pocket. Before this system was installed a certain plant had been inspected and the usual check-ups made, but the inspector was not aware of two deaths which had occurred in this plant. When the records on that plant came from the statistical unit the inspector noted that a man had fallen into a vat and had been killed and that another man had met the same fate. The inspector called again and of course asked to be shown the place.

It appeared the laborers using wheelbarrows to bring materials to a vat had on two occasions overshot the mark, the weight of the loaded wheelbarrows had jerked them off their balance and pulled them into the vat. The keen eye of the factory inspector noticed at once that the block designed to stop the wheelbarrows had been worn to such an extent that the wheel easily carried over the block. He promptly ordered a larger and square-shaped block and the accidents ceased. The point of this tale is, of course, that the inspector became effective when he entered the plant with the pertinent facts that had been supplied to him by a statistical unit connected with the Department of Labor. Thus, statistics influenced action and were a force in the service of accident prevention.

Sometimes we see things better in perspective. Let me remind you, therefore, of the attitude of Florence Nightingale towards statistics. We think of her as a woman of excellent birth and training who took the trouble to go over to the German hospitals to learn the best then known hospital methods, and who therefore, when the Crimean War came, was led on to render the signal service for which she has been immortalized. It is perhaps less well known that she protested against the way in which statistics were buried in the records of the war department instead of being used as a guide for action. She not only urged those in responsible positions to use statistics, but she urged those who prepared the statistics to make them usable. That is, she placed emphasis on the style of the writer and on the quality of the text as well as on the accuracy of the data.

Florence Nightingale, who was known to the soldiers as the "Angel of the Lamp" because of the way she went through the wards at night shielding the light from their eyes with her hand, was also the advocate of the unshielded lamp of statistics in controlling medical problems and fostering hospital and social technique. She gave herself with devotion to a great cause, but she never lost sight of the fact that the truest path of progress would be found with the help of measurement and records. In short she embodied in herself the finest personal qualities and an insight that statistics should be a guide to action.

The need in modern governmental statistics, as truly as in the day of Florence Nightingale 100 years ago, is that there shall be more emphasis on interpretation. Statistics should not be thought of as columns of figures arrayed in tables as part of so much ritual, but as the systematic and effective presentation of the fundamental facts that shall determine the course of development in any great social movement, such as that of accident prevention.

It would do good both to the statistician and the factory inspector if, at the conclusion of each year's tabulation, the statistician were brought face to face with the factory inspectors and required to tell them what the figures show and how their campaign of action should be modified in the light of the latest available facts. Such a proceeding would be a stern reminder to the statistician that it is not the figures alone but the study of the figures by the person who is in the best position to make such a study and who has within him the insight and resources to interpret the statistics, that must be thought of if the statistics are to be effective in accident prevention. It would also be a reminder to the factory inspector that he should supplement his first-hand impressions by the larger information concerning basic trends and developments in industry, and that he should modify his tactics and renew his enthusiasm by trying to make the sad accident record of each year less gruesome than that of the year before.

In retrospect we can see that the safety movement clung too long to a dominant interest in machine guarding. If the procedure here advocated had been followed, the importance of falls would have been realized and interest in good housekeeping might have come 10 years earlier.

Let me list a number of the recent developments in the field of accident statistics. The first, to which I have already referred, is the recognition in a number of States of the value of combining the

accident statistics as secured from a compensation division with the marching orders that are given to the factory inspectors. The inspector in his hotel room the night before calling on a plant can familiarize himself with the details of the accidents that have occurred in that plant since the time of his last visit. Miss Perkins' introduction of this technique in New York State was the occasion of Mr. Gernon's reading the many thousand accident reports of which he has just told us. This first development may be described as the placing of the accident records at the disposal of the factory inspectors.

The second is the meeting of statisticians and the safety men to interpret the tabulations in the light of experience and to generalize experience with the aid of the tabulations. The two types of workers would meet together in a board of strategy.

The third development has to do with accident causes. The work of Mr. Heinrich, of the Travelers Insurance Co., and of his subcommittee in the American Standards Association represents a notable contribution to the technique of determining the causes of accidents. Certainly the first step in any scientific procedure is to determine, if possible, the relations between cause and effect.

Now a word of explanation is necessary. For a long time New York, for example, has published bulletins on the "causes of accidents", but in fact the subject matter is scarcely on the cause of accidents. It is mostly on the cause of injuries. The accidents are classified, for example, "falls." But a fall does not cause an accident—it is an accident. It causes a broken kneecap or some other injury. The cause of the accident was faulty illumination, worn treads on the stairs, too clumsy a load to be carried, or some such reason. This kind of information is not in the reports, and from the nature of the case is not in the tabulations.

States that wish to do some real work in accident prevention would do well to familiarize themselves with the Heinrich code, either in its original version or as modified by the National Safety Council. But after some experience in Albany I will have to say that it would not be wise, in my judgment, to introduce the Heinrich code directly. It would be better to hold to the old criterion of types of accidents, or accidents classified by instruments and agents, such as "handling tools", "handling small objects", "falls", and so forth. Under each of the old classifications begin the study of causes, using the Heinrich code.

The reason for the note of caution, in spite of the fact that I am enthusiastic for the Heinrich code, is this: There are, as Mr. Gernon has intimated, so few accident reports that really tell the cause, that if you try to classify by causes of accidents as the major category, perhaps two-thirds or even nine-tenths of all the reports will have to be put under the headings "indefinite", "unknown", or "not otherwise classified", and the statistician does not like a classification that throws the bulk of his data into the unknown.

The procedure then would be to hold to the old categories until we have educated the employers, personnel directors, claim agents, physicians, and others who are concerned, as to what is meant by "cause" and have persuaded them to give us the facts which will make such classification possible. Then my advice would be just the reverse: make the cause of accidents the primary classification. That, however, will be some years hence, I fear.

The movement should be hastened by a new kind of safety contest in which a prize will go, not to the firm with the lowest accident record, but to the firm whose analysis of causes shows the most discriminating insight and frankest statement and whose willingness to face this question makes it a trail blazer to bring other firms to take the scientific point of view.

It is interesting to note that, in connection with this new emphasis on the cause of accidents rather than on the cause of injury, the misplaced light rather than the fall, you get back to the question with which the whole problem of industrial accidents and employers' liability began, "Who is to blame?" In the old days the question "Who is to blame?" was raised by lawyers, and, begging their pardon, they mismanaged the matter shamefully. They said that if the employee has contributed by his own negligence, then—so far as any money settlement is concerned—he is to blame and the employer is not liable. Or if a fellow employee has contributed to the accident or the risk is recognized as characteristic of the industry, then, in either of these cases, the employer is not to blame. The great reform of workmen's compensation was to do away with the question, "Who is to blame?" and substitute the question, "Who has been hurt and how badly?" The compensation benefits are exactly the same whether the injured party was primarily at fault or whether he was not at fault. The question, "Who is to blame?" was done away with under workmen's compensation, except perhaps in the more or less mythical case of self-inflicted injury.

The question, "Who is to blame?" turned out to be a false clue when raised by the lawyer to determine damages, but it is showing itself to be an open sesame when asked by the safety engineer to prevent recurrence. Heinrich places the vast preponderance of the responsibility with the management.

An important practical consideration grows out of the old association of "Who is to blame?" with the money settlement. There is a certain amount of hold-over in the minds of employers, especially of those less informed and on the part of new referees who have not fully grasped the philosophy of workmen's compensation, to the effect that it does make some difference as to who is to blame. Therefore, neither this question nor any other on the fundamental cause of the accident should be on the compensation accident report form. To ask the cause of the injury is as far as it is wise to go. Even if employers and their insurance companies were willing to answer frankly, it takes too much time to make sure of the true cause of the accident and prompt reporting should not be sacrificed. The questions on causes should be on a separate piece of paper and there should be assurances that the form will not be seen by the compensation division, but only by those engaged in accident prevention.

A fourth development of accident-prevention statistics can be thought of in terms of some of the alphabetical organizations in Washington. The engineers who were working on certain emergency projects were seemingly indifferent to accident-prevention statistics. They showed strange apathy toward the gathering of the facts and even went so far as to say there were not any cave-ins, or they did not amount to anything. But when some of the statistical persuasion insisted on gathering information and tabulating it and showing

what an alarming number of cave-ins there were, then orders went out by telegraph for new methods of caretaking in the matter of cave-ins.

A fifth type of development in statistics of accident prevention I can perhaps symbolize by the name of Mr. Kjaer of our group. He has been one of the prime moving spirits in a committee that has had charge of building up codes of safe practice or standards of safety and industrial health in connection with the N. R. A. codes. Most of the N. R. A. codes include the provision that within a certain time limit there must be set up standards of safe practice. The committee appointed by the Secretary of Labor, on which were represented various organizations such as the National Safety Council and so forth, has been preparing one set of requirements after another outlining procedures of safe practice for the various N. R. A. industries.

Another type of development in statistics for accident prevention can be symbolized—I am simply using the names as a convenience, as pegs to hang the theme on—by the name of Copeland, the executive director of the Central Statistical Board, which has jurisdiction over the statistical activities of the various Federal governmental organizations. The Central Statistical Board is seeking to bring unity out of chaos between the organizations having statistics dealing with accidents, such as the United States Bureau of Labor Statistics, State industrial commissions, Bureau of Mines, Interstate Commerce Commission, the Census Bureau of the Department of Commerce, United States Employees' Compensation Commission, Women's Bureau of the Department of Labor, Children's Bureau of the Department of Labor, and the United States Public Health Service, the last named in connection primarily with industrial diseases rather than industrial accidents. When the Central Statistical Board runs out of work in coordinating these agencies, I hope it will bring the State statistics to a comparable basis. Only by trying to compare the statistics of one State with those of another can one realize the difficulties that are now uncontrolled.

That group of organizations should be paralleled in our minds with the mention of such organizations as the National Safety Council, the various insurance companies, the corporations themselves, notably in the iron and steel industry, and shall I say our own I. A. I. A. B. C. I think also that we must not forget the very distinctive achievements of the International Labor Office.

Under the leadership of the Central Statistical Board and thanks especially to Dr. Clague and Dr. Givens of the Advisory Committee to the Secretary of Labor and to the work of Mr. Slocombe of the Personnel Association, there has been prepared a report that I hope will be a stepping stone in accident-statistics work in America.

There must be new emphasis on interpretation, first interpretation, of the statistics as statistics and then as a guide to action. For example, we must not ignore such distinctions as the different meanings of "closed cases" in Illinois and in New York. In Illinois a "closed case" is one on which the final payment has been made. In New York a "closed case" is a case that has been adjudicated and the amount determined, the payments to go on in the future. The Illinois law, unlike that of New York, requires the receipts to be filed throughout the entire period of months that compensation pay-

ments continue. With such differences in definition, any statistics are misleading unless the required adjustments are made. Similarly, it must be determined by methods of statistical technique whether the various samples are large enough to justify the computing of frequency and severity rates.

There are a number of developments in the field of accident prevention that come pretty close to statistics though they probably would not be listed under that head. One is a survey of the administrative activities of the various States, which is now being undertaken at the instigation of Secretary Perkins and Commissioner Lubin and is in the hands of Mr. Marshall Dawson. That will serve as a new impetus toward improved administration, including the statistical activities on the part of the various States. And in parallel with the emphasis on the administration of workmen's compensation I hope that survey will spread over into the administration of accident prevention as carried on through the States. Too long the dollar has controlled the thinking of the State departments, and the fact that workmen's compensation benefits could be spoken of in terms of dollars—for example, \$36,000,000 a year in New York State—has tended to exalt the awarding of money and to overshadow the work of accident prevention.

There are certain States that are putting safety into their educational programs, the three R's—reading, writing, arithmetic—are matched by three other compulsory subjects—history, civics, and safety. There is every reason to commend a movement of this kind that is free from politics and from the clash of conflicting industrial interests. It is all to the good that the safety movement should be given a certain professional status. Education in safety is part of the socializing process by which our young people become ready for the complexities of modern civilization.

A brilliant example of how statistics can be used and were used for carrying out a definite policy can, perhaps, be symbolized by the name of Miriam Noll, of Illinois. The women's clubs had become interested in industrial accidents to minors. For some years she studied this question, and at last the light was shed so clearly that it was possible to approach the legislature on the basis of carefully ascertained facts. With the help of her reports a law was passed imposing a penalty in the case of minors illegally employed. As a legislative compromise the penalty was only 50 percent in addition to the regular compensation, but the burden could not be shifted to an insurance company. Here was a distinct statistical and research project, leading to legislative action and check-up. That is an example of statistics in the service of a definite program.

Another example, from New York, was in connection with a proposed increase of the maximum weekly allowance from \$20 to \$25. The question was, What would it cost? The figure estimated by certain opposing interests was twice the estimate of the bureau of statistics and information. The law finally passed and a check-up became possible. The result showed that the State bureau was within 5 percent (it had overestimated by this much), but the figures submitted by the opposition had overshoot the mark by 100 percent. There again is an example of statistics in the service of a development of a legislative type.

The International Association of Governmental Labor Officials, which is in touch with factory-inspection divisions, is in one sense freer in spirit to deal with accident prevention than the I. A. I. A. B. C. The accident boards and commissions are hearing cases; they are deciding human contests; they are awarding money; their daily work makes their minds intent on workmen's compensation. The governmental labor officials and directors of labor in various State departments, whose emphasis is not only on administration of the workmen's compensation law, but also on factory inspection, statistics, the work of women's bureaus, children's bureaus, and so forth, ought to feel a twofold responsibility and be concerned with appropriations for a program of prevention *and* compensation.

On the other hand, those of the I. A. I. A. B. C. gain intimate and concrete acquaintance with industrial accidents. Their knowledge is in every sense of the word a knowledge of individual cases. They too might summon the State statisticians once a year to tell the results of their studies and what principles emerge when the cases are summarized into averages and trends. One of my illustrations shows statistics in the service of compensation; that is, of more adequate benefits. The labor statistician should feel the responsibility of seeing to it that his statistics are in the service of every major activity of the department of labor, and the rest of the department should see that he has enough stimulus, understanding, and support to discharge his obligations. Greater than any financial support, indispensable as that is, would be a scientific attitude of willingness to shape policies, employ new strategies, and launch new offensives against that waste in industry and shame of American civilization—the grievous burden of industrial accidents.

Chairman KEARNS. One of the other problems with which all of the boards and various enforcement departments, of course, are confronted from time to time is occupational disease—disease in the various industries, and the causes of the various diseases, the conditions that are responsible for them, and the means of eliminating these conditions. We are fortunate, indeed, to have with us this afternoon a gentleman who has had a lot of experience in industrial medicine and occupational disease work. I understand he has been assistant to Dr. Quimby for a number of years and is at present connected with the Hood Rubber Co., of Watertown, Mass., in the capacity of industrial physician. I know that Dr. Shirley will have a real message for us on this subject of Disease-Producing causes in Industry.

Disease-Producing Causes in Industry

By J. NEWTON SHIRLEY, M. D., of Hood Rubber Co., Watertown, Mass.

When given this subject to speak on I could not help but think how much better it would be to say, "Causes which may produce disease in industry if they are allowed to develop." You, as men interested in good and safe working conditions, also dream of the day when there will be no cases of disease produced by industry.

With the advancement in civilization and education has developed industry. The workman has been obliged to handle materials which

are more or less toxic and work under conditions which may jeopardize his health. As medical science has progressed, industrial diseases have been recognized and their causes definitely isolated, so that today we may anticipate disease unless certain safeguards or precautions are taken. We may even anticipate trouble before a new process is put into operation and develop safeguards to protect the worker. Yet industrial disease is prevalent and will continue to be so. No one has as yet been able to control human nature in its tendency to be careless and take chances. Nor are we 100 percent perfect in preventing machinery breakdowns which may subject the workman to toxic fumes, dusts, or bad working conditions.

The various States recognize the responsibility of the employer in these cases, and compensation is paid through a list of compensable diseases or the interpretation of the law accepting industrial disease as a personal injury, thus penalizing the employer when they develop. We are constantly drawing the guard chains closer.

The common causes of diseases due to industry may be listed as: (1) Metals and their salts; (2) fumes or vapors; (3) dusts of organic substances; (4) bacteria and parasites; (5) working conditions. I shall amplify this classification.

Let us consider the metals and their salts. Lead has by far the most serious record as a cause of industrial disease. This metal should be watched from the time it is mined through its many processes to the time it is junked, for it is even dangerous in the process of discarding it. It has toxic properties which require watching in every form in which it appears. Let us consider the places where evidence will incriminate this material—lead smelting, lead oxide manufacturing, paint manufacturing, rubber compounding, pottery glazing, painting, pewter manufacturing, storage-battery work (especially paste making and pasting), type setting, monotype and linotype machines, electrotyping, scrapping of steel with heavy red lead paint by acetylene torch, and many lesser incidences in this great industrial world.

Lead is absorbed by the respiratory tract, digestive tract, and very slightly through the skin. Undoubtedly the greatest source of danger is through the respiratory tract and any workman handling lead in any form will be exposed to lead dust in variable quantities.

The symptoms of acute lead poisoning are more or less similar, and diagnosis should be fairly simple from the history and clinical findings, which should include a blood smear and possibly a urinalysis for presence of lead. Chronic cases are decidedly obscure in symptomatology and physical findings, diagnosis often being made only after the history of exposure to lead is obtained. In chronic cases of lead absorption, where there have been no symptoms, lead is stored in the bones and if an acute infection or any condition tending to draw on the tissue reserves for nourishment intervenes, symptoms of acute lead poisoning may crop up and be hard to explain. Communities where lead workers predominate have shown in the past an increased incidence of cardiorenal and vascular disease in late middle age.

Chromium, as chromic acid and its salts, is fast appearing in large amounts in industry. The lesions found are on the mucous mem-

branes and skin. The first is noted in chromium plating where the uncontrolled spray may attack the nasal septum, leading to perforation. The second is noted in the tanning and dyeing industries, where the solutions or dust from the materials used to make the solutions cause the chronic slow-healing chrome ulcer. Fatal results are rare and then only the result of secondary infections.

Zinc is a metal often labeled dangerous, but now we realize that, other than the zinc chills noted in employees exposed to zinc-oxide fumes or dust in sufficient quantities, there is no evidence of chronic tissue changes. The only case I have seen personally was a welder who reported with chills and remarked that he had experienced them before while at work in the navy yard. He returned to work the next day.

Arsenic enters into industry as an insecticide and yellow pigment. There is some arsenic found in other metal compounds. The symptoms are frequently found to have been caused by the other metals present. Arsenic does cause a chronic irritation of the skin. When absorbed by the respiratory or digestive tracts, arsenic is a mucous membrane irritant and later causes a polyneuritis. In workers exposed over a long period of time, multiple warty, precancerous type of nodules appear. It does not seem to play a great part in industry today save for men in forestry work, where insecticides containing arsenic are used in large quantities.

Mercury formerly was considered a particularly toxic material by toxicologists, but today industry has few instances of poisoning. The gingivitis and metallic taste are said to be the first symptoms and later gastro-intestinal, renal, and nervous-system lesions are noted. Perhaps improved methods have nearly removed this hazard from industry.

Phosphorus is a metal capable of producing serious industrial disease. History tells us of the chronic periostitis and osteomyelitis of the jaw which so frequently occurred in the workers. The work done on this industrial poison some 15 to 20 years ago was so well done that cases of phosphorous poisoning are rare today.

Manganese, used in steel manufacturing and dry-cell batteries, is definitely toxic to the central nervous system, simulating multiple sclerosis. It is not common and usually comes from breathing the dust.

Copper has been known to cause liver changes when the fumes or fine dust is inhaled. Its salts are readily soluble and as such may be found in their use as insecticides. The other metals present are usually more toxic. Copper dust, as an ingredient of brass, causes dermatitis and appears to produce chronic skin ulcers.

Several other more rare metals are toxic, but their use is so restricted that little evidence of industrial disease is found except in experimental work.

We should not overlook the possibility of changes in the use of metals, as a system of dust control which has been satisfactory for several years may be inefficient if the metal in process is more finely divided. Such an occurrence was noted in a rubber factory when a much finer ground litharge was used in the process—270 mesh as compared with 120 mesh.

Fumes and vapors compose the largest part of our present-day exposure to toxic materials. They occur very largely in the hydrocarbon group with the halogen derivatives and are the products of petroleum and coal-tar distillations. The group is large and only a few may be justly considered.

While carbon monoxide is not a hydrocarbon, it may well be considered at this time. This cause of industrial disease is met in numerous industrial processes. The exposure is noted in garages—truck drivers; workmen employed in trenches, manholes, excavations, mines, etc. The picture is that of asphyxiation due to loss of oxygen when the hemoglobin is changed into methemoglobin. This may result in temporary cerebral symptoms. The case quickly responds to appropriate treatment or becomes fatal. Are there any lasting effects? When we consider the possibility of the presence of heart or arterial disease in the employee, we can readily understand how such a condition may cause lasting disability. There is a growing belief that exposure to small amounts of carbon monoxide over a period of time does produce lasting pathology in the central nervous system.

The volatile hydrocarbons and their halogen derivatives all have toxic properties to a variable amount. Benzol has been studied thoroughly and is now used only under strict supervision. The manufacture of this product is relatively safe because of the enclosed system used. When used in industry, its use is largely as a solvent or conveyor of other materials and must be volatilized after serving its purpose. These fumes must be removed. The effect of this substance is largely on the blood-forming organs, producing an aplastic anemia, diagnostic in appearance in the normal individual. In the presence of other pathology in the blood-forming system, differential diagnoses may be difficult. We find this substance used in the artificial-leather, patent-leather, rubber, and shoe industries mainly. The production of dyes and dye-intermediates consumes large quantities of benzol, but the process is primarily a closed one and hazard occurs only in the breakdown of the system used. Publicity has warned the manufacturer of the danger benzol presents and substitutes have been introduced; for example, latex in the sanitary-can manufacturing, varnoline or Stoddard's solvent in dry cleaning, solvent naphtha in the rubber industry. Semiclosed systems have been developed in the artificial-leather industry. Massachusetts goes further, requiring the labeling of benzol-containing products, so that all users may know there is a hazard.

The petroleum hydrocarbons are capable of producing symptoms which are temporary in nature and far less toxic than the coal-tar products. Exposure to small quantities over a long period of time is claimed to produce symptoms of mental sluggishness but no definite picture is found. We are confronted with the possibility of certain of the more volatile petroleum solvents containing an appreciable quantity of benzol. It is claimed that Pacific coast gasoline does contain 10 to 15 percent benzol.

Passing over the rest of this group, I am going on to the dusts of organic substances. This opens up the immense field of dermatitis and allergy. The simplest problem we find is ivy poisoning, a condition which has become very troublesome in this age of Federal reem-

ployment road building and other work. The reaction is primarily temporary.

From this simple cause of dermatitis we go on to the handlers of fruits and vegetables, where idiosyncrasy plays an important part. Then into the woodworking shops where dust from teakwood and similar hardwoods has stirred up dermatitis.

The baker who is susceptible to the starches must find another type of employment.

In the rubber industry, outbreaks of dermatitis have been sporadic and usually follow the introduction of a new accelerator which, in the process of compounding, breaks down into organic materials similar to those found in hexamethylenetetramine. These materials can readily be patch tested. The dermatitis is rarely severe, but there is the occasional case where an employee, once reacting to an accelerator, cannot return to work on any product where that accelerator has been used. As a practical point, I would like to say that frequently these accelerators alone cause no reaction, but that after being compounded the reaction is readily noticed from the compounded gum, the dust on the liners used to keep layers of this gum separated and even from the finished vulcanized product. Cases are on record where a surgeon's gloves, even after sterilization by boiling water, have caused a dermatitis so severe as to incapacitate the surgeon for several weeks.

Consideration of dust would not be complete without calling on our friend, or enemy, silica. There is no subject receiving more attention than silicosis. Numerous studies have been made in an attempt to ascertain the proper requirements necessary to safeguard the workmen exposed to dust containing free silica. We know that silicosis is a typical form of pneumoconiosis caused by free silica as dust particles from 0.5-10 microns in diameter, that these particles do reach the alveolar spaces, are picked up by the so-called "dust cells", are carried into the lymph channels, kill the cell, and set up an inflammatory reaction which produces scar tissue or fibrosis. It is only a question of the dust concentration of the inspired air and length of exposure before this fibrotic change will produce sufficient symptoms to bother the employee. It then becomes a question of exposure to tubercle bacilli and the development of tuberculosis, as this organism appears to thrive in the presence of silica changes. Stonemason's disease has been known for ages, but only in the last decade have we learned the pathological development of this condition. Where do we find silicosis? Primarily we see it in its worst form in the granite industry, but it is prevalent in mining, tunnel building, stone crushing, and sand blasting. It is found in foundries, scouring-powder manufacturing, and other places where men are exposed to dust containing material amounts of free silica. This possibility should be considered in all dusty processes.

At the present time there is a growing belief that the various silicates may produce a similar condition. As all cases noted have required so much longer time to produce symptoms and X-ray evidence, I think it is fair to say the changes are due to the free silica which occurs in the silicates. There is one exception, asbestosis. Asbestos produces changes which are typical and different than what we find in silicosis and develops during a somewhat shorter period of exposure.

Other forms of pneumoconiosis occur in the other dusty trades. The possibility of tuberculosis complicating such a condition is almost as great as in silicosis.

Mention should be made of caisson disease. In these days of building tunnels and foundations below the water level, where compressed air is required, strict supervision of workers has become necessary. Because of the dangers met in this type of work, preemployment examination and routine physical check-up of workers are necessary.

There are a small group of bacterial or parasitic infections typical of certain types of industry: Anthrax or woolsorter's disease from infection with anthrax bacilli from improperly sterilized hides or hair; furunculosis among machinists where the cutting oils are not properly sterilized; glanders in men handling horses and mules; hookworm infection in mines where sanitation is poor. The skin infections we may find where hand work requires the passing of an article from one employee to another and some one in the line has an infection. All these are problems that industry must consider.

In addition to all these conditions where the materials handled or used in process of manufacturing may cause disease, we cannot overlook the conditions under which the employee does his work. We must consider the light, the humidity, the intense heat, and the variable temperatures under which men must work to complete their jobs. These are all factors which may affect the health of the worker. All cannot be ideal.

When we consider all the possibilities mentioned in the past few minutes, is it at all surprising that the large manufacturer has installed a medical department to assist him in detecting and preventing the same? He examines his applicants for employment to see that they are physically fit to go to work on that particular job. He reexamines those employees who may be exposed to toxic materials to detect symptoms of exposure to dangerous concentration of these toxic materials. This is done at periodic intervals governed by the type of exposure. He also renders first-aid treatment in cases of illness and investigates absenteeism, that he may watch the health of his employees in the various sections of the plant. When he detects an unusual incidence of any one condition, he investigates the department affected to see what is wrong so that his preventive measures may be corrected.

You, as the labor department representatives, have to act as the watchdog for the smaller manufacturer and see that he provides safe working conditions for his employees, that his preventive measures are of the approved type and adequate, so that our industrial workers as a class may enjoy good health for as many years of productive labor as is possible.

DISCUSSION

Chairman KEARNS. We are all convinced, I think, that Dr. Shirley has given a great deal of time and thought to the preparation of his paper, and that it contains a lot of very valuable information on diseases of occupation that will be helpful to each and every one of us who is confronted with the problem of industrial disease. I am wondering if there is someone who wishes to ask a question.

Miss DOE (New Hampshire). I should like to ask Dr. Shirley to what extent glass blowing is injurious to the employee, and if injurious, how long a week an employee may work safely?

Dr. SHIRLEY. That is a problem with which I am entirely unfamiliar. Many of these conditions I have bumped into, but, as it happens, I am unfamiliar with glass blowing. I know the workers are exposed to extreme heat and the work is more or less laborious, and that there are certain factors which must be considered, but I have no definite information on that.

Miss DOE. What would be the effect of the blowing?

Dr. SHIRLEY. I should not expect it to have any deleterious effect on a normal individual, but with any person suffering from a pulmonary disease it might be quite bad.

Mr. JOHANNSEN (Illinois). I should like to ask Dr. Shirley if his work has been connected with some of the benzol substances that are used in industry today?

Dr. SHIRLEY. There are undoubtedly health hazards connected with some of them, but those substances are nowhere near as toxic as benzol. For instance, in the Safety Council work we recommended the substitution of xylol and toluol where possible. Xylol and toluol frequently will produce changes similar to benzol but it requires a much larger quantity, and we feel that the use of those substances might be possible where adequate ventilation in the use of benzol does not seem to be possible. Of course, the high-test alpha naphthol would produce certain toxic changes. There is always the problem whether they will not produce chronic changes, but at the present time it has never been accepted that chronic changes are produced. All those industries as a whole, however, are using approved types of ventilation to protect their employees.

Mr. JOHANNSEN. I should like to ask the doctor if, in his opinion, after lead has been found in the bone of the individual inhaling lead, it is still dangerous to him?

Dr. SHIRLEY. Dr. Aub mentioned that yesterday morning. Lead, of course, is deposited in the bone and may remain there for quite a period of time, and that employee may have a condition in which there is an elevation of the temperature and a call on the reserve nourishment supply of the body. During that process a certain amount of that lead is liberated, and there may be a sufficient amount liberated at once to produce symptoms of acute lead poisoning.

Mr. JOHANNSEN. The reason I ask is that in a case we had of blood poisoning the body was exhumed for the purpose of autopsy, and a certain degree of lead deposit in the bone was found. Expert doctors testified in that case that the lead that had been so deposited was no longer injurious to the individual and hence should not be taken into consideration by the commission in arriving at an award. Of course we did not believe them.

Mr. DAVIE (New Hampshire). I may have misunderstood you as to zinc, but take men in a brass foundry compounding yellow brass, with the fine little feathers in the air, what has been your experience with that?

Dr. SHIRLEY. The work on zinc was very well done by the Harvard School of Public Health. Dr. Drinker was in contact with that, and his conclusions were that zinc dust is nothing more than zinc oxide dust in very fine particles, which produces a febrile reaction, typically shown in the manufacture of zinc oxide powder in New Jersey, where men have to go in to shake down the bag. This febrile reaction may be sufficient to make a man quite sick. Then he develops an immunity and can continue that work for quite a period of time with no known effect from the zinc. So far as I know, that is what you get in the work you refer to.

The only experience I have had was the case of a welder welding the inside of a kettle with a brass welding compound. He came in with chills, definite chills. I did not know what it was at first. That was before I was familiar with zinc. "Oh", he said, "that is nothing more than brass chills; we used to get them quite commonly over in the navy yard." He went home that day and went to bed, and the next day he returned perfectly all right. If the zinc workers in New Jersey had a 2 weeks' shut-down, when they came back to work they would have to go through the chills before they could again work on that particular job. So far as I know, there is no injury to the general system in any way, shape, or manner. It is a natural reaction. I think they have to go through that disablement. It is the same with vaccine. To immunize a person against an organism you have to have that reaction.

[A short recess was here taken.]

Chairman, JOHN P. MEADE, Director Division of Industrial Safety, Department of Labor and Industries of Massachusetts

Chairman MEADE. I am in no mood, and I know you are not, to enter into a discussion of the problems incidental to industrial health. In the first place, one could not do full justice to even a very small part of the subject in the few minutes one presides here. When the program was made up it was thought that possibly one-half of it would be devoted to the work of actual accident prevention, and the second half would be devoted to the problem of occupational-disease prevention.

In following that plan it is obvious, of course, that there could not be discussed at a single meeting all the various problems in connection with the prevention of occupational diseases, and hence it was deemed advisable and thought helpful to pick out one of the outstanding problems in connection with that work, and at this session deal definitely, wholly, and adequately, so far as the limitations would permit, with the subject of exhaust systems in the removal or control of dust, fumes, and gases.

There is no need for me to dwell upon the value of industrial health, and to outline to you what it means to the home and to the community to have the problems in connection with industrial health fully understood and the police power of the Commonwealth utilized for the purpose of protecting the worker in his work space in that connection. I am simply going to introduce the speakers to you, for I am sure the pictures they will throw here upon the canvas will talk louder and more eloquently and powerfully than any of us could.

Our first number comes from a gentleman who is actively identified, and has been for many years, as a pioneer in the work of preventing industrial injuries—not only accidents but diseases of occupation as well. There is probably no engineer in the United States, no inspector in the country, who is not familiar with the achievements of Mr. Beyer and with his contribution to this work. I am going to ask him to address you and to throw his illustrations on the canvas. His subject is *The Use of Exhaust Systems for the Protection of Workers Exposed to Dust, Vapors, and Fumes*. I take great pleasure in introducing Mr. David S. Beyer, chief engineer of the Liberty Mutual Insurance Co., Boston.

The Use of Exhaust Systems for the Protection of Workers Exposed to Dust, Vapors, and Fumes

By DAVID STUART BEYER, *Chief Engineer Liberty Mutual Insurance Co., Boston.*

(Assisted by S. W. Gurney in demonstrating experiments)

I think perhaps the keynote of my discussion would be very similar to that of Mr. Wilcox, who made an appeal for accuracy and scientific study in connection with statistics. That is certainly coming to be essential in the handling of the industrial-disease problem.

I remember a story—I am not sure that I have all the facts correct—about the theory of a falling body. Some old Greek philosopher, I think it was Plato, reasoned out the idea that the speed of falling bodies should vary in proportion to their weight. Everybody accepted that and for many years went along on that theory; and then some fellow, I think it was Galileo, climbed up in the leaning tower of Pisa and let drop two objects from the tower, and he proved that the platonic theory was all wrong. Some people were very sore about it but that did not revise the fact, and they had to revise their methods.

Some such practical tests as that are essential if you are going to discover the facts and produce effective means of controlling industrial diseases, and one of the practical methods for doing so is by the exhaust system. There has been a great deal of guesswork and loose thinking, together with a great deal of misapplication of principles or knowledge, because for many years the ventilating engineers merely thought in terms of changing the air so many times. They were used to working with schoolhouses, public halls, and so on, and they did a very good job at that. But when it came to the problem of meeting these insidious and invisible gases and dusts, they were at a loss, and only now are they beginning to take hold of those matters in an intelligent way.

The old practice when some gas or dust became objectionable in a plant—and it had to be objectionable before any attention was paid to it—was to call a tinsmith and tell him to stick in a fan and some piping and take care of it. Sometimes the tinsmith got results but more often he did not. We have found out since that the eyes and the nose are not an infallible indication of the need for protection of this kind, because so many of these substances are invisible and can deceive the eye. If you get a dust that is invisible to start with

you are somewhat at a loss. That the nose is not infallible either we know because the gases and substances that smell the worst are not necessarily the most dangerous. Carbon monoxide and some of those substances that you cannot detect by the senses are quickly fatal under certain conditions.

An insurance company has a very wide-spread view of many of the problems which were discussed here by Dr. Shirley. They are coming up at all times in the industries and in many industries where a few years ago no one realized that they were even present. So I will try to give you a few illustrations and a view of the methods we have adopted, which we think are of value and interest in connection with the handling of industrial diseases. I might say, by way of passing, that there is more than one industry today where the cost of industrial-disease claims far outnumbers the cost of all other accidents—5 and 10 times the cost of industrial injuries; so that in certain industries at least this is a tremendously important problem. I will cite just one or two situations with which we have come in contact and then show you some pictures of actual plant conditions.

One of these rather interesting cases came up in a plant which started a new process of annealing, heat-treating certain small parts, and those in charge decided that they could advantageously use mercury in that process. They looked up the very excellent little pamphlet of one of the State labor departments, which said that the results of mercury inhalation generally develop slowly after a long exposure. So they went ahead with their process, and within a very few days several of the men became seriously affected. Two or three of them now have brand new sets of false teeth at the expense of the insurance company. Their teeth have fallen out, and at least they do not have to worry about any personal injury to their teeth from now on, because any good claim man will tell you that damage to false teeth is property damage and not personal injury. It developed on investigation that they had overlooked the fact that in this pamphlet the State labor department referred to cold mercury, which does give off a slight vapor. The diffusion of this vapor is very slight if it is cold, but if you heat it up it is very rapid. So in their process, in which they heated the mercury, these people got the results in a few days that would ordinarily have taken months. Of course they were anxious to start the process and had gone ahead thinking they could get through without claims but they were conclusively proven to be wrong.

In that case, as in so many other cases, there had been some change; some new process; and in all these conditions it is very important to know just what can be done to secure scientific knowledge of the condition before you go ahead. In other words, we should all become Galileos and go out and see what the conditions are, and not just take some general theory and say everything is going to be all right.

There is another interesting problem before us now which is of wide-spread importance in industry, and that is dust in foundries. Many foundries use a fine parting compound. It is something like flour, and is shaken out of a bag. One would think the parting compound did not amount to much, that there was a small exposure, but recent studies have shown that it is about 60 percent of the total dust exposure in the foundry. Studies which we have made

by analyzing dust accumulated after the rafters had been cleaned down show the same thing—that it is the source of more than half the dust in many foundries.

It is difficult to apply an exhaust system that will carry off these dusts from an entire line of molders; but there have been developed, as many of you know, various types of nonsilica or low-silica parting compounds. We have analyzed them by the microscope and found that some of these so-called low-silica parting compounds have silica and dangerous silicates up to 10 and in one case at least 25 percent. Some of them are extremely low in silica, under 1 percent, and there are several under 5 percent. So there is no reason why we cannot, under proper conditions, produce a material that is low in silica.

Once we know the facts, we will find that some of these materials are being put out by well-intentioned people who think, and will tell you in all sincerity, that the material is perfectly safe; and sometimes they are rather indignant when we suggest that there may be something wrong with it. That is another type of problem where we must know the facts if we are going to take intelligent action, and unless we do we will simply find the same old problem confronting us.

Now we will show you a few slides and then show you a few experiments.

[Slide.] This is a picture showing what must have happened during the construction of the pyramids of Egypt. I thought it was interesting in this connection. With all the sand and dust that must have been present at that time, we know there must have been a tremendous exposure to silica. We have no actual accidents records, of course, or statistics such as Mr. Wilcox discussed, for that time, but we do find references in some of the books of the time to the great number of deaths that occurred.

[Slide.] This is the kind of records they used at that time. That indicates that accidents did sometimes occur, and if such records were kept to the fullest extent during the building of the pyramids, they probably would have built another pyramid.

[Slide.] Here is one of our modern plants. We speak of these dusts that cause the trouble as being invisible, but there are certain conditions under which they may become visible. We happened to go into this plant on a day that was favorable, when the sun was shining and the dust and fumes were rather heavy, and we got a picture which shows the whole condition, merely by the light flashing on the dust particles.

[Slide.] As I said, the old idea was simply to call in the tinsmith, who did not understand anything about the ventilating principle, and tell him to put in some pipes. This installation, to my knowledge, goes back some 25 or 30 years, and the idea was to get the dust drawn out through pipes. The pipes are so far away, as we will show you a little later, that they could have very little effect on the dust. They would at first, it is true, result in better ventilation by drawing in more air and diluting the dust somewhat. However, samples taken in rooms similar to that showed that the dust was far from being removed.

[Slide.] This is one of the more modern installations that reduce the clouds through an overhead system of hoods at the point of

the machine where the dust is generated. We would not say those were 100-percent efficient, because of incomplete enclosure.

[Slide.] There are a few fundamental principles that much experience in visiting hundreds of these plants shows are generally misunderstood or at least are not applied in many of the installations. Here are a couple of charts illustrating studies by the Harvard School of Public Health, showing the actual airflow. This represents a pipe, and these lines show you the airflows which were used, but the rate at which the airflow dropped so rapidly that even 2 or 3 inches away from the mouth of the pipe you might be getting only 5 percent of the efficiency or the speed of the air right at the mouth. Most of our State standards are based on airflow in the pipe, and some of them bring in the idea of a suction static head, as we will illustrate later. But it is a common, almost universal, error in plants, in the past, where there has not been careful and expert technical advice, to think that dust can be drawn for a long distance. I have seen rooms or areas as large as this room with a 3- or 4-inch exhaust pipe in it by which it was hoped to clear the whole of the large area; as a matter of fact, it would clear a space the size of your hat perhaps. The air tends to flow in from all sides, but by changing the shape and by putting a flange on the head, for instance, which keeps off the air from this side, the efficiency of the system may be very substantially increased.

[Slide.] Here is another chart, also one by courtesy of Dr. Hatch of the Harvard School of Public Health, which shows actual dust counts, dust readings, taken for different airflows in the same equipment, where you would get 100,000,000 particles concentration at a certain airflow, and by approximately doubling that—increasing it two or three times—you could cut the actual number of dust particles under 10,000,000; in other words, get a 90-percent reduction in the actual dust content of the air merely by putting in a larger fan or increasing the amount of air that is drawn through it. No one can tell just by looking at it. There again you need the actual test with a machine which will show the dust conditions before and after installation if you are going to tackle the problem intelligently.

[Slide.] Here is an actual installation in a granite plant in Massachusetts—the Fletcher plant, with which some of you may be familiar—in which were made those tests evolved by Mr. Hatch of which I have been speaking. It shows the stonecutters at work, with this exhaust system. There is a very powerful fan, which has been applied so that this man can, by a reasonable adjustment to his work, keep the dust particles in the air under 5,000,000 per cubic foot. One thing in this system that interested me is, that where there are a great many branches, the system is so designed that with every branch left wide open it would still get the desired suction. In some of these systems you see provided a gate or valve to shut off the air when you are not using it, from the standpoint of economy and reducing expense in power. That is all right if the men will remember to open it again, but it is just one more thing to follow up, and in this case it was said, "We will have the system big enough so they are all drawing in air all the time and at the same time."

[Slide.] Here is another application of that same thought also in this same plant. These figures are produced from the Massachusetts commission, or shown by the authority of the department of industrial hygiene. Some of you may have seen some of them in the booklet it issued.

[Slide.] This shows, not very clearly because it is not in focus, dust in a factory which is collected overhead.

[Slide.] Here is an exhaust system which was arranged for cleaning down these rafters, and after that they showed up very, very clean and free from any dust. They found that it facilitated removing the dust to use a broom and dust around well for the large deposits, and this exhaust system was very effective in taking the finer particles.

[Slide.] Here is another type of installation. The exhaust is brought up underneath the table where the men are handling these asbestos disks, and a powerful suction draws the dust down and prevents the operator from being injured by it.

[Slide.] The lower part of this picture is interesting. Here is a condition that you find in so many plants with a rather expensive exhaust system; the floor is evidently covered, up to 6 inches or so, by the fine dust that has sifted out of the barrels.

[Slide.] Here is another; you see the dust piled up around here. This man was wearing a respirator because it was impossible to remove all the dust by the exhaust equipment that was applied to that machine, but as soon as he stopped the machine, with great relief he took the respirator off and breathed in what he thought was pure air. Since it takes several hours for dust to settle, the air he was getting was just as much contaminated with dust as when the machine was running; but it illustrates the difficulty of getting men to wear respirators continuously and the desirability, wherever possible, of removing the dust mechanically.

[Slide.] Here is another type of machine, also in the asbestos industry, that was provided with a very good exhaust installation, but particles were flying out, and tests showed high concentrations, as much as 20 or 30 million dust particles. By merely extending these hoods downward and enlarging the enclosure, without any other improvement in the exhaust system than to change the filters a little oftener, that exposure can be cut down to well under 5,000,000 particles.

[Slide.] This illustrates another error in an exhaust system which we find frequently. The plant had spent a good many thousand dollars in putting in an excellent filter system, and thought it was so good that the air in the plant could be changed without piping it outside. That is possible, but it is always a dangerous, risky thing to do, because unless the filter is watched very carefully it becomes ineffective to such an extent, at least, as to permit a dangerous condition to arise.

[Slide.] Here is another tumbling barrel, supposed to be partitioned off and the dust thoroughly exhausted, and yet you see the dust around it piled inches deep.

[Slide.] Here was another situation that we happened to see at that particular plant with the expensive exhaust installation. The dust had been cleaned out and brought out and dumped in an unused

portion of the yard. It happened to be a somewhat windy day, and the dust was flying in clouds—a billion particles per cubic foot—and a lot of it was being blown right back into the plant from which it had been so expensively and with such trouble eliminated. So the disposition of this dust is a problem that must receive careful attention.

[Slide.] Here is another type of problem. This is the so-called “daily washer” in which a solvent, the fumes of which are hazardous, is used. Tests which were taken with the opening in the front of the machine wide open, showed a dangerous exposure to the gases. Nine readings were taken—across the upper edge, the center, the lower edge. By putting in a screen, which is simply a curtain, something like a window shade, which comes down half way, and without any other change in the exhaust system than cutting down the amount of air drawn into the opening, the airflow was just about doubled, and accurate scientific tests showed a safe condition.

[Slide.] This is another illustration of the necessity of testing these conditions. We cannot reason them out theoretically. Here is another machine equipped with an exhaust system. That is too far back. Dust counts with this impinger showed hazardous exposure in that particular operation, although a lot of money had been spent putting in exhaust equipment.

[Slide.] We will show in a moment one of several instruments which we think are very helpful in this work of determining the dust conditions, taking readings before and after changes are made and taking dust samples in plants to show where the worst disease conditions are. This was taken with an instrument called the konimeter, and showed, I believe, 5 or 6 million particles, which is not much worse than you might find in a room like this after people have been tramping around.

[Slide.] Here is another one that runs up to 25 or 30 million particles. You can take samples with this instrument in 30 seconds and show just how much fine dust there is. With every breath a man takes in about 300 times as much dust as this sample, that is, 5 cubic centimeters. He takes in about 300 times that many particles, and it is that fine material, you know—we estimate 25 to 50 percent of those particles—which remains in the lungs. The lungs are equipped to take care of a certain amount of it, but in large volume it cannot be removed, and something is needed to get rid of it.

[Slide.] That sample reminds one of the milky way at night. It is up to 40 and 50 million particles per cubic foot.

Those are just a few of the high lights encountered from day to day in these industrial problems that are handled from the standpoint of the insurance company.

We have here a miniature exhaust system, and we plan to show you 4 or 5 simple experiments indicating airflow, and which illustrate the principles that were brought out in these charts.

We tried to get some substance which would be a source of smoke. We thought of the smoke clouds that are laid down by airplanes, and upon inquiry we found they used titanium tetrachloride. The old saying that where there is smoke there is fire does not hold in this case because you can get a very nice smoke cloud and it is absolutely cold. It is simply air being drawn over this liquid that causes the

smoke, and Mr. Gurney is neutralizing it by a little bit of ammonia, so it is titanium tetrachloride ammonium.

Mr. GURNEY (assisting). We found sometimes that the use of this apparatus turns out better than the more accurate instruments that are available. This has been sitting around all afternoon and it is clogged up. It shows the smoke against the screen, so that I think you can see it because of the light behind it.

Mr. BEYER. This is guaranteed not to suffocate you, by the way.

Mr. GURNEY. We have a little fan here which is very effective and, proportionately, does a very good job. I think you can see that even with the operation of this fan none of this source of contamination out here is being drawn into the hood itself. One of the features that I believe was brought out in the talk was that you cannot give air a directional pull but you can give it a directional push very easily; that is, the same amount of air is coming out of this exhaust evidently as is coming in at this end, and by this means we can give it a directional push.

Mr. BEYER. The next illustration is that air suction draws air from all directions, so that if you are drawing air from in back of the hood a lot of it is wasted.

Mr. GURNEY [illustrating]. I hope this will show that a lot of our ventilation is going around the back of the hood.

Mr. BEYER. It draws air equally. It is as though the opening of the pipe is the center and air is being drawn in from all directions.

The next point is demonstrating air velocity away from the hood being increased by the addition of a flange.

Mr. GURNEY. By putting it at about this point we are getting about an equal amount of smoke going in and not going in. By simply putting on this flange here most of the smoke will be going into the hood.

Mr. BEYER. I might say that actual tests in the laboratory showed that the air velocity increased from 88 to 130—that is, nearly 50 percent—at 2 inches and at 4 inches there was no noticeable velocity; by putting on the flange it increased 120 feet per minute. So you see what that small change can do in the way of increasing efficiency.

The next experiment shows the rapid drop in air velocity as the distance from the hood opening increases.

Mr. GURNEY. I think you can see we are getting a very good air velocity at this end, and as we gradually pull that back we are getting no effect from the exhaust at all. I might show that with the anemometer. At that point you can see we are getting very good velocity. At about 2 inches we are getting a velocity of about 20 feet per minute. At this point we have not enough air velocity even to move the instrument, in spite of our good airflow.

Mr. BEYER. It is only about 4 inches away in that particular area. Now, with that push-and-pull system Mr. Gurney showed you a moment ago you can see how you push the air. Here and there we have been able to do that quite effectively by combining an air jet, for instance, blowing across a table where asbestos material is handled. The same principle is now being employed in foundries. There was an article in the last Foundry Journal on that, an interesting devel-

opment, and that principle is capable, I think, of a great deal more use. You can cut down power consumption and make the system more effective by utilizing an air jet as well as suction. These [pointing] are just a little series of paper streamers attached to the fan. You notice that only one of the streamers that are closest on the side at present is being deflected. If we bring the same amount of air at a much farther distance it drives with considerable power the particles, or in this case the streamers, into the exhaust.

Mr. GURNEY. In working a system of this sort, of course, where a really poisonous vapor or dust is involved, the air should be filtered.

Mr. BEYER. In the last of this particular series of demonstrations we will try to show the effect of interferences between two exhaust systems. Many plants have a general ventilating system, and then they put in a local exhaust system at a particular machine or point where dust is causing trouble. The two may absolutely offset each other at a certain neutral point around the operator, so he is getting no effect from either one. This left fan represents the general exhaust system going in one direction. There is a neutral point there where the dust is still diffused, some of it picked up by this fan, but a great deal is disseminated in the general atmosphere, bringing it over this way to a point where the general exhaust system will bring it all, but we have actually found a number of cases where the two different systems offset each other so that the operator got no benefit from either of them.

As we said, some of the State standards are based largely on U-tube action of measuring the static head to determine the effectiveness of the system.

Mr. GURNEY. I do not think there is enough head there actually to measure it, but at the same time we are getting a very good exhaust ventilation at our opening. By putting in a resistance in front there we get about 1 inch of water pressure there without any increase in the effectiveness of our ventilation out in front. In this case we are perhaps competing with some general system, as we were not in the first case, but we are not getting good ventilation. This perhaps represents the effect of dust accumulating in the duct before the fan. It still increases our static head more but does not improve our ventilation. The effect of the dust again nullifies this without a proportionate change in our actual ventilation effectiveness.

Mr. BEYER. That ends this particular part of the program, showing some of the present exhaust systems. There are one or two other instruments that I will mention, and then the discussion is over.

This instrument represents what is known as a Zeiss konimeter, with which I took the samples that were shown on the latter slides by simply depressing this plunger and then releasing it and drawing in a certain amount of air. We made our dust smears on the glass slides, and you can put them under a microscope and see the invisible dust. We have used this in several hundred plants, and it is a very effective means of interesting the employer, the superintendent, and the foreman, and all that hard-boiled crew who do not think there is any dust there. This shows it to them. This is a rather expensive instrument; it costs \$200 and comes from Germany.

Another instrument has recently been developed by Dr. Hatch and Mr. Thompson of the American Mutual, and I hope that arrangements can be worked out for putting that machine on the market before long. It is merely a little pump, like a bicycle pump, by which you draw in a sample of air and look at it on an ordinary microscopic slide. Another possible improvement would be to connect a small microscope to it so that you can immediately visualize the thing. Some such instrument as that is absolutely necessary to determine, in the first place, your problem so far as dust is concerned.

This device which I now hold in my hand is another one used by us. It is known as the Kata thermometer for measuring air velocities, and is an instrument used in England. It is based on the effect of air in cooling a bulb after it has been heated and gives quite accurate readings for airflows up to 400—would you say?

Mr. GURNEY. Five hundred.

Mr. BEYER. Well, airflows that cannot be measured on the anemometer.

Mr. GURNEY. This is very accurate for figuring down to 10 to 100 feet per minute, which is the average velocity that you find in plant ventilation; that is, at the hood.

Mr. BEYER. We have another instrument which will be illustrated. It is on the principle of a blowtorch which gives a blue flame.

Mr. GURNEY. As Dr. Shirley mentioned, there is coming into use in industry a large number of substances that are quite toxic. This is simply an adaptation of a plain blowtorch, the fuel being alcohol, and under normal conditions it gives the typical blue flame that alcohol gives. If we introduced in the atmosphere there a small amount of any one of the halides, the flame immediately turns green, and the depth of the green color is the measure of the amount present, not accurate quantitatively, but merely relatively.

Mr. BEYER. The last instrument that we will mention is this petrographic microscope, by means of which you can determine the actual silica content or other mineral content of very fine dust, 10 microns or under. I believe there is great use for that, because dust having a silica content is a very harmful substance, and if you are required to obtain a dust count based on the number of million particles per cubic foot you need to know what dust exists. The results from samples of dust under 10 microns may be vastly different from those shown by chemical analysis of the material, and even dust that you pick up around the plant contains large particles as well as small. We have some slides here showing sections of lungs with asbestos and other minerals imbedded, and you can actually see the dust particles in the lungs.

The whole thought that I want to leave with you is that an exhaust system is not just putting in a fan or a window or opening somewhere and then everything is going to be all right. It involves a number of very intricate problems in engineering, and possibly chemistry and metallurgy, and it necessitates standards which can be authoritatively accepted as giving the amount of tolerance of the human mechanism to these different things. There is a tremendous amount of work to be done, and the next speaker will tell you something about how long it has taken to develop such standards.

Chairman MEADE. We have with us Mr. Vogt of the industrial hygiene division of the New York Department of Labor, who will talk to us on Exhaust Systems and the Importance and Effectiveness of Removing Material at Its Point of Origin, and show us some slides in connection therewith.

Exhaust Systems and the Importance and Effectiveness of Removing Material at Its Point of Origin

By JOHN H. VOGT, *Mechanical Engineer, Division of Industrial Hygiene, Department of Labor of New York*

An exhaust system is a complete device constructed for the removal of dust, fumes, vapors, gases, and refuse which are generated within confined spaces where people are employed. Exhaust systems are now used in almost every industry in order to maintain healthful and safe conditions within places where material in either a solid or gaseous form are disengaged in industrial processes.

Ventilating problems may, for convenience, be classified into three groups: (a) Fresh-air supply systems; (b) local exhaust systems; (c) dust-collecting and conveying systems of waste material. It would be a difficult matter to decide which is the best. The exhaust system is the most important method of removing air impurities. Nearly all deleterious material disengaged in manufacturing operations can be successfully eliminated by this method and at less cost than either of the others.

The first considerations in designing are to know the physical properties of the substance to be handled, the natural movement of the gases, fumes, or dust, and the layout, in order that the device installed will in no way interfere with the operation of the machine or device or hinder production. It is therefore essential to observe the working of a machine or device in actual practice.

The next step consists in determining the type and position of hood, canopy, snout, or orifice to be used in connection with the installation. The dimensions or shape of these depends upon the nature of the operation and the character of the material to be handled.

Some standards have been created for various classes of work; for instance, in the operation of grinding, polishing, and buffing wheels, we have the requirement under the New York State Industrial Code rule 733 that "when the top of the wheel runs toward the operator, the main suction pipe must be back and below the wheel and as close to it as possible." Industrial code rule 735 provides that each hood must be so constructed as to expose the smallest portion of the wheel consistent with efficient operation, with free edges of the hood turned back to prevent injury to workmen.

All abrasive wheels must be provided with either protection flanges or protection hoods, according to industrial code rule 992. Pipe sizes are required for various wheel diameters and thicknesses, with an air movement requirement as set forth in industrial code rule 735. (A minimum of 2-inch static suction must be maintained in the branch pipes attached to the hoods.) Hence, there is provided a standard of construction and air movement through the pipe con-

nected to a hood which can be relied upon as being effective and safe in controlling material disengaged from all grinding, polishing, and buffing operations.

Hood design.—The main feature of hood design is to provide for the strongest air movement at the point where dust is created and to arrange for the dust to be projected into the air current in the pipe attached to the hood. Where heavy abraded particles are produced in the operation of grinding, a dust trap may be conveniently provided to catch these particles which readily fall by gravity.

The grinding or buffing of various sizes and shapes of work naturally require different designs of hoods. For example, lengths of bar iron require a hood through which, at one end, the bar may project. Swing-frame grinders may be used on a table or bench with a downward air movement through a grating as well as a lateral pipe connection. The grinding of springs for wagons or trucks, where the angle formed with wheel and work varies from 60 to 80 degrees from a horizontal position, requires large hoods with several pipe connections to make the hood under such operating conditions effective to control the dust.

The removal of dust from any machine or device through a hood is done by the creation of a counterforce in the form of air in motion through the hood to overcome the energy possessed by the material torn off by the action of the wheel, and requires the air movement to be of sufficient force to draw it through the hood, piping, and separator to a refuse bin or box.

The air velocity required depends on the nature of the material, size of particle, and its specific gravity, although for ordinary purposes the maintenance of an air velocity of 4,000 feet per minute through pipes, which is the minimum standard in New York State, gives good results and creates little hardship on manufacturers to maintain.

The division of industrial hygiene possesses photographs of many styles of special hoods, copies of which may be secured by interested firms or individuals.

Under the industrial code rule 1750 it is required that flatwork ironers in laundries be provided with a hood or canopy, in which the spread of the rolls or chests must be covered and constructed so as to collect all steam, vapor, and heat which is generated. Rule 1751 provides that the air velocity through the base of the hood must be not less than 35 feet per minute, and the test for such velocity must be made in the branch pipe near the hood connection by the use of a standardized anemometer.

For example, if the base of the hood measures 10 feet wide by 12 feet in length, the volume of air required to be moved is 4,200 cubic feet. If the pipe or pipes attached to the hood have a cross-sectional area of 6 square feet, the velocity required is 700 feet per minute. The requirements of the rules insure good control of steam and heated air from such machines.

New York State has a standard in its industrial code rule that, in stone-surfacing machines, the area of the intake orifice attached to the flexible hose leading to a fan and separator must be not less than 24 square inches. The type of orifice for such machines can be improved. The usual distance the snouts are placed from the

cutting tool is 6 inches. By constructing the orifices or snouts in the form of a sector of a circle, with a rubber pendant between the lower section of the snout and the surface of the rock, and providing a flange $1\frac{1}{4}$ inches high at the top and side of this hood and placing it within 2 inches of the cutting tool, the coefficient of air flow in front of the hood can be greatly increased. With such an installation the air movement, as required by law, of 5,600 feet per minute, can be maintained through the orifice of the snouts. Anemometer tests show an air velocity of 2,000 feet per minute 3 inches from the orifice; at 6 inches, 850 feet, and at 12 inches, 300 feet per minute, or 20 percent greater than by the use of a straight rectangular hood of similar area without a flange or pendant. The increased efficiency of the hood or snout was due to the added flange, the rubber pendant, and its curved form.

Dust can be controlled in most cases when the enclosures are placed near the points where the dust is created; for example, vertical or horizontal abrasive belts may be enclosed except for the portion where the belt operates. Such an enclosure must be provided with pipe connections, having intake orifices placed as near as possible to the moving abrasive belt where it enters and again leaves the metal enclosure. Air velocities created by the exhaust fan should be as high at the orifices as possible. The moving belt greatly aids in pulling the dust to the orifice.

Metal-melting pots, properly hooded and provided with a metal enclosure between the base of the hood and lip of the pot, in which there is an opening for operation, through which the air velocity of 100 feet per minute is maintained by the action of the exhaust fan, will effectively control any fumes created within the so-called "hood", provided the operating opening is not too high. A visor of metal placed above the opening assists in preventing the escape of heated air and fumes from such an opening. A simple test may be made by anyone to determine the efficiency of such a device as described, while the pot is being operated, by casting a small amount of dry ammonium chloride on the surface of the molten metal in the pot. Dense white fumes are disengaged which, if the air movement through the operating opening is sufficient, will not escape from the hood.

Another method of determining the effectiveness of a hood and the air movement maintained through it is by the use of a dust count. The method is scientifically correct, but reliance must be placed upon existing laws relating to the subject until such standards are set forth by law.

New York State, according to rule 701, requires every employer to file plans with the department of labor of all proposed or amended exhaust-system installations.

By this requirement, manufacturers are compelled to construct the systems according to law and code rules, according to approved plans, rather than depend upon persons who may furnish a device incapable of controlling and removing the deleterious material from the factory, which may be a serious menace to the health of employees who are obliged to labor where such material is created and allowed to remain.

The New York State Department of Labor has the duty of supervising these plans, not only for the purpose of seeing that they conform with State laws, but also for the purpose of determining their advantage from a hygienic point of view.

[Mr. Vogt here presented a series of slides illustrating his subject.]

I believe, very much as the Chinese believe, that every picture is worth 7,000 words, and since seeing is believing I have brought with me about 30 slides.

[Slide.] This is a system in connection with an abrasive belt which, as you can see, is entirely enclosed except for that portion which is on the operating table. This [indicating] is the table, which may be moved back and forth at will, and on the surface of the belt the man may run his tool by pressing down the belt upon the object which is to be abraded. In most cases sandpaper and other abrasives are used. There is a requirement in our code that for a 6-inch belt there must be two connections, one of at least 5 inches and another one of not less than 4 inches. We are guided by laws; these rules have been made after very careful work for years by subcommittees and committees, and finally have been enacted as a part of the industrial code.

[Slide.] This shows the same arrangement with all of the doors open. Naturally, it shows the two upper idlers here where you notice a small opening in the metal construction, which has to be done because these idlers are raised or lowered in order to make the belt tight.

[Slide.] The bandsaw is a machine which likewise creates a lot of very fine dust. This is the Tannwitz type. It is equipped with a tilting table. A requirement of our law is that all bandsaws which are less than 2 inches in width must be provided with two 4-inch pipes, one on the under side of the table and one on the upper. The next picture will show everything opened up and the table in a horizontal position in order to allow the bandsaw to pass through the hood and down around the wheel. You can see at this particular point the orifice and the other side on the up travel of the saw. That entire saw, as required by the dangerous-machinery-code rules, must be enclosed except between the guide and the table; so in this particular case we are not only complying with the requirements of the code to remove the dust but also the requirements to protect the operator from being cut in any way.

[Slide.] This is a sand barrel 48 inches in width and 24 inches in diameter. The law requires, of course, that the dust be removed from time to time, and as this has more than 2,400 square inches of surface, the law requires that a pipe or pipes, properly placed, must be not less than 7 inches in diameter.

[Slide.] The next picture will show an inside view of the same. The reason that this was constructed in this way was that the material which was being sandpapered was made of long teeth and had to be cast into the hood where it formed various angles with the wheel and the work.

[Slide.] This is a horizontal fan belt in which every part is enclosed except that part where the operation is performed. In this particular case a belt 12 inches in width or less must be provided with 2 exhaust pipes, 1 at the bottom and 1 at the other end.

The code refers to one at the top and one at the bottom. That is faulty, however, because the proper place of removal is at the bottom.

[Slide.] Bandsaws are, some of them, 6 or 8 inches in width, and some of them are called twin bandsaws. In tests which were conducted by my associate, after running a double-header which was entirely enclosed and operated for an entire morning from 8 o'clock until 12, all the sawdust which came from the boards, which were 12 inches in thickness, was about half a bushel. You can understand that with the cut about an eighth of an inch wide, 12 inches in depth, operating just as fast as the boards could be put in, and cutting 2 boards at a time—that is, making 3 boards of 1 in sawing them through—this whole thing must have been very effective. This, however, is only a single band resaw, and this shows the feeder side. These [pointing] are rollers which are thrown into it by the operation of placing a board against it, and the next picture will show the take-off side of that same band resaw.

[Slide.] This one is in the Western Electric Co. on Metropolitan Avenue in the Borough of Queens. The machine is entirely enclosed and is bled at 3 points, 1 directly underneath here, 1 in the pit, and 1, if you remember correctly, on the up-side of the travel where the blade passes through a hood which would take off any dust that was not efficiently removed from the other 2 points.

[Slide.] This is the same band resaw with all the doors open. You see the doors here [pointing]. This is a door on one side and the door on the other, and a section coming up here was entirely removed. It is not shown in the photograph.

[Slide.] This is a 48-inch disk sander or disk wheel, of which, you can see, there are 3 sections; that is, our law requires that not less than a 2-inch static suction be provided for removing dust, and if in the opinion of the commissioner it is necessary to maintain a still higher air movement we insist upon it. The periphery of this wheel is properly guarded, and the entire part beneath the table on the reverse side is entirely enclosed. Of course, if the operator works here, the tendency to throw off the material tangentially in the course of operation will be taken care of by the three guides which are attached to it.

[Slide.] This is what we call the "double-header shaper." It is fast coming into the market at the present time. Those are the old type and simply show a hood on the top of the table, but now they are made so that in sandpapering grillwork there is also an air movement through the table as well as where the material would be cast off tangent to the operation, and so it is necessary to have two sets of pipe connections. That, I believe, is not taken care of in our code.

[Slide.] One of the objectionable things in the making of mattresses is caused by the garnetting of old or new material, cotton linters, but the matter has been solved by entirely enclosing, as nearly as possible, the working rolls right up to the doffer of the machine. This is ordinarily the feed box in which the cotton linters or whatever is to be garnetted is placed, either by hand or mechanically fed from a condenser. This is entirely enclosed, as the operation creates a large amount of dust, and from this part here the entire part, begin-

ning with the working rolls until you come to the fancy roll, is entirely enclosed, and likewise this [pointing], right over this set of working rolls over to the doffer and the comb. We also insist, and a great deal of good is accomplished in requiring it, that the frames be entirely enclosed but capable of being removed; that is, that the sections can be removed, because at times fires occur in these machines and it is necessary to get at the stock in order to put out the fire and not ruin the machine.

[Slide.] This metal-melting pot is one that is in great demand. It is about 3 feet high, and the one shown has a visor here, and is capable of maintaining an airflow of 100 feet. That was actually the estimate of what is necessary when the metal is frozen, and to obtain an air movement of 100 feet was considered ample. You can see the pipe which is attached to the combustion chamber and leads into the hood. We do not want any higher suction there, for the reason that if there were, too much air would be drawn from the combustion chamber, and it would take many times the amount of gas to provide the heat to keep the metal in molten condition.

[Slide.] One of the difficulties experienced in former years in cement plants, of which we have quite a number in New York State, occurred in the bagging process, and this shows a large hood which the operator uses as the empty bags are passed to him. The bags are filled and automatically weighed, and as he fills them they fall down onto an endless belt, which carries them out at right angles to the place where they are reloaded into cars. This pipe leads from the pit, having an orifice or snout at the point where these bags fall into the endless conveyor. The conditions here are such that, with a blue suit on, you could go into that place and stay there for an hour and on coming out you would find very little dust on you. The problem, we feel, has been solved.

[Slide.] These are fumes given off from a coating machine. The machine gave off these dense fumes, and naturally the whole machine had to be hooded. The next photograph will show the same machine in operation.

[Slide.] Here it is properly hooded. Simply placing a hood directly above this would not, in my opinion, have controlled the fumes and smoke disengaged by that machine, although theoretically we knew the velocity around the perimeter of the tank. In mathematics it is well known that 1.4 times the velocity at the perimeter, times the height, gives the velocity at the point desired here.

[Slide.] The removal of dust from grinding wheels is a very important subject, and there are so many different kinds of operations that, of course, no set hood can be provided for all. This shows a man grinding the blades of a brass propeller. At times the man would work on the hub and the material disengaged would be projected downward, and then he would work upon the blades when another angle would be formed. In our code it is provided that wheels of a given diameter and a given thickness require pipe connections of definite sizes, and that the air movement be not less than 4,000 feet per minute. In this particular case I made fan tests just to determine what the air velocity would be through a cross-section of this hood, on which there were two pipes. I took some 8 or 10 measurements at different points, and the average over this

entire cross section was over 400 feet per minute. I was very much interested in what the previous speaker said when speaking of the tests he made. I have known for years of the tests the chemical engineers made as far back as 1912, 1913, 1914, and 1915 for the New York State Factory Investigation Commission, directly after the terrible catastrophe of the Triangle Waist Co. fire. Some of those tests which were made for determining the air current make up a part of the industrial code rules which we have today.

[Slide.] This is the same type of hood, showing all material being placed on the same type of wheel with the same hood. I brought this along because it was a little bit clearer. It shows the two pipe connections here; that is, the piping which is required by the code is shown here. Section 299 of our law, you remember, provides that the dust must be removed, and therefore as a matter of safety we put on this additional pipe, which not only would drag along the heavy particles but would also create an air movement through the entire cross-section area of the hood.

[Slide.] This is another kind of hood in connection with grinding wheels. You see the wheels here, and here [pointing] are springs on endless belts, and as they are ground they are simply placed on here and taken off. The new grinders have these springs, which in position vary perhaps 60 to 70 degrees from the horizontal position. They are working directly in and against the hood, and at other times they are working almost vertically. The next picture will show the number of pipe connections to that particular kind of hood.

[Slide.] Of course these elbows are not properly made. Our law, rule 720, provides that the center-line radius must be twice that of the pipe, in order to get the least amount of resistance that is created in air flowing in a right-angle elbow constructed with a radius of two times the pipe's diameter.

[Slide.] This shows still another type of hood along the same principle as the previous one. This is for the large bumper spring of automobiles, and no standard hood could be used except one of this type, and in order to remove all of the dust it was necessary to put on the second pipe connection. By the way, the previous speaker made mention of the fact that the main pipe must be equal to the sum of the areas of the branches; that is, the pipe must become larger and larger as your branches enter it, and they must enter at 45 degrees or less in order to get a uniform airflow without the use of any kind of equalizing dampers or blast gates. When tests are made in reference to the acceptance of exhaust systems in our State, all of the blast gates must be open just the same as if all the machines were being used at one time.

[Slide.] This is the front view of that same wheel and hood, showing of course the 2-pipe connection.

[Slide.] Going back again to the previous speaker, and making mention also of the vast amounts of dust which are disengaged in garnetting operations, this shows such a machine where the exhaust is not in operation. It shows the vast cloud of dust. Tests which have been made by our mechanical engineer showed as high as 100,000,000 particles per cubic foot of air at 1 foot distance from the working tool.

[Slide.] The next one shows the standard snout of which I spoke in my paper, measuring, in accordance with the requirements of our code, 24 inches at the opening, and this flexible hose attached to this snout, as it is called in the trade, likewise complies with the code. We also require an air movement through that equivalent to 5,600 linear feet of air per minute.

[Slide.] Experiments have shown that by adding that small visor, or at least a little piece put in the back here, as was shown by the previous speaker, and by taking an anemometer and moving it 3 inches away, 6 inches away, and 12 inches away from the orifice, this arrangement, in the form of a sector of a circle rather than a square orifice, increased the velocity 20 percent. We require, at the present time, this snout to be placed within 2 inches of the tool.

[Slide.] I spoke in my address of a requirement of our code that on flatwork ironers the air movement must be 35 linear feet of air per square-foot section area of the hood. Assume that this hood is 10 by 10 feet, 35 times that would be 3,500 cubic feet of air which must be moved through that hood. If that pipe is $5\frac{1}{2}$ square feet in area, then the velocity must be 1,000 feet in this pipe, according to our code rules. These code rules have not been based upon ordinary hearsay; they have been made after actual tests conducted over a period of several years. Our code, however, does not require these hoods to have any heat-retarding material upon them.

I mentioned before that I would give you a definition of what excessive heat in the laundry is. Excessive temperature in the laundry is construed to mean that when the outdoor temperature is below 70, the indoor temperature must be above 80 when there is less than 8 degrees between the temperature inside and the wet-bulb reading; that is to say, if the outdoor temperature, let us say, is 40 or 50, the indoor temperature must be above 80, let us say 81, when the wet-bulb reading is, let us say, 79. That is excessive temperature, and we find, when this is taken down at the point of origin, so much heat is removed that it is unnecessary to cover this over with heat-retarding material.

[Slide.] This is simply a barrel filling where the grinders discharge directly into the barrel—a simple method of raising up this cover, so there are canvas curtains, which makes an easy method of filling the barrel with the dust disengaged in the work. We have to have simple methods; we cannot have engineers or other experts going around the system and make tests, as we handle about 1,200 plants a year.

[Slide.] This is a metal-melting pot from which the fumes are drawn away laterally. The previous speaker illustrated that at a given point there was no air movement when lateral suction is used. In this particular case, having an overhead monorail, shown here, there is no other method of having a hood placed over here, so the fumes had to be drawn away laterally. There is a formula given by the code for 1934, prepared by the American Society of Heat and Ventilating Engineers, that works out very well—it has its limitations—that one-tenth the fixed factor multiplied by the area of the orifice in feet, divided by the square of the distance where you want to take away from the hood—where you want to take your air move-

ment—multiplied by the factor of the efficiency of the hood, multiplied by the velocity through here [pointing], will give the axial velocity at the point you want. We have tested that out and found it to be fairly good. The next picture, I believe, will show it.

[Slide.] This is the system that was put in by one company; it is entirely constructed of Monel metal—55 cents a pound. It shows the orifice here at the 4-inch wheel over the 36-inch vat and 6 feet long, in which there is an air velocity of 1,700 feet per minute. At this point, the remotest point, there should have been theoretically 30 feet velocity, and there were 25 or 26 feet velocity. We fell down just a little, but that is really nothing but theory against practice. Theory is all right, but it must be backed up by practice.

Chairman MEADE. For some few years the American Standards Association has given careful consideration and study to the question of exhaust systems, their type of construction, what they should accomplish, and the ultimate adoption by the various States of the tentative rules and regulations which the American Standards Association has adopted. Sitting on that committee, which worked long and faithfully on that subject, was Mr. Roach, Deputy Commissioner of Labor of New Jersey. We expected him to be here, but unfortunately he could not come. However, he has sent us a very good substitute, Mr. Weeks, Deputy Labor Commissioner of New Jersey, who is always ready to give us valuable, expert, and experienced judgment on matters that come before that organization for attention.

Codes for Exhaust Systems—Why States Should Help Prepare Them

By JOHN ROACH, *Deputy Commissioner, Department of Labor of New Jersey.*

[Read by Charles H. Weeks]

The Problem

The vital human problem that is involved in protecting the health of workers in our industries is receiving more attention at the present time than ever in the history of industrial medicine. A few years ago it was quite unusual to attend a convention and hear discussions on the care of workers that would seem to imply that employers had more than an academic and casual interest in the subject. It may be that the policy of "let well enough alone" had not entirely died out, and employers were willing to deny any responsibility to their workers beyond that involved in bargaining with them for a wage and paying that wage at the end of a stipulated period.

While it is true that governmental authorities, health departments, labor departments, research workers, and Federal divisions of Government were, to a limited extent, interested in the question of health protection, it must be conceded that until the last few years that interest was only a mild one, and only recently have we been thoroughly aroused to the need for wide-spread education, as well as the intelligent application of approved engineering principles to the mechanical features involved in protecting men and women from the substances handled by them during the period of their employment.

Dust Causes Disease

In several of our industrial States, workmen's compensation commissioners have accepted the theory that certain forms of consumption may be accepted as of industrial origin, and that devitalized or poisoned air, darkness, dampness, undue fatigue, and similar conditions that break down the normal resisting power of the individual, may cause physical complications that entitle the victim to compensation payments for injuries arising in and growing out of his employment. The point has been ably set forth that improper working conditions and impure breathing atmosphere may prepare the worker for tubercular infection by setting up a progressive inflammation of the mucous membrane of the nose, throat, and lung tissues.

When we turn to the records of the extrahazardous "lung trades" (listed in F. L. Hoffman's *Dusty Trades*, published by the Federal Bureau of Labor Statistics), a full realization of the sufferings of the workers in these industries is possible. The question of how much dust or the kind of dust that by irritating the lungs may cause tubercular infection to develop is one for the deeply learned in the medical profession to discuss, but I am willing to stand on the general theory that every worker is entitled to safe, hygienic working conditions; none should be exposed to the discomforts, much less the dangers of industrial dust, noxious fumes, or excessive heat during the period of his employment. Engineering science has made such strides in the field of mechanical ventilation that there is no longer any deep-seated or intricate problem involved in the arrangement of processing methods that will prevent the installation of practical mechanical devices to confine or remove dust, vapors, and gases at their points of origin.

Some years ago a paper was read before the Chicago Medical Society that treated the subject of clean air by dividing occupational diseases into five classes: (1) Those due to gases, vapors, and high temperatures; (2) those due to increased or decreased atmospheric pressure; (3) those due to metallic poison, dust, or fume; (4) those due to organic dust and heated atmosphere; (5) those due to fatigue.

Clean Air a Preventive

This classification shows the part played by fresh air in the prevention of occupational disease, and an earlier general knowledge of the subject would not only have saved the workers an immense amount of needless suffering and ill health, but would also have conserved the enormous financial waste due to unsanitary conditions throughout a wide range of industry.

It has been estimated that an adult man when sitting at rest takes 16 respirations per minute of 30 cubic inches each, or 480 cubic inches per minute; a worker in a 8-hour day breathes from 250 to 350 cubic feet, according to the vigor of his muscular exertion. The basic relation between vitality and normal lung function has been well established in the scientific calculation that respiration during the average workday represents an expenditure of energy expressed by the lifting of 7 tons 1 foot.

Whether the functions of the body during the normal working period shall be permitted to replace the broken-down tissue caused

by the liberation of this energy or steadily to drain the system of its reserve vital forces, depends upon the quantity and quality of the pure air that prevents the poisons of fatigue from accumulating.

So if we look at this question of desirability from a common-sense standpoint, I am sure we shall all agree that definite and intelligent standards should be adopted that would provide the very greatest measure of protection to workers that the nature and type of occupation will permit. I feel confident that the general attitude of employers toward the introduction of expensive plant improvements has broadened during the past 25 years to such an extent that they are willing to go to the root in providing for the ultimate safety of the worker.

The only thing we have to consider is the question: How can intelligent standards be prepared in the most capable manner? Is it possible for individual State governments to give this question the technical consideration that it deserves? Is it possible for the Federal Government to make research studies that will be helpful in this matter? Is it possible for certain trade groups, where poisonous gases or harmful dusts are created in an industry, to investigate and apply corrective principles that will insure a satisfactory measure of protection for workmen?

I am confident that none of these agencies mentioned can do this work in a thoroughly capable manner by going alone. I think the whole question of protecting workers from the evil consequences that may arise when they breathe or absorb poisons or dusts is so intricate and involved with such technical difficulties that its solution will require the service of the best minds in this country. For that reason I am definitely committed to the principle of working with the American Standards Association in the development of industrial standards in attempting to get all the States to adopt the same kind of standards, so that there is unity and harmony in State procedure in this respect. Where States go it alone in attempting to develop industrial standards or leave the question to the action of a State legislature, the best results are not achieved, and often rules are adopted that either fail to protect the worker properly or in their enforcement may impose a hardship on the employer in a trade group.

I know Mr. John Vogt, who has devoted a great deal of thought to this subject, will agree with me when I say that the several States that adopted blower regulations, i. e., rules governing the installation of exhaust systems for removing dust caused by buffing, polishing, and grinding operations, and that stipulated that in the suction pipes a movement of air should be created sufficient to raise 5 inches of water in a U-shaped tube committed a grave engineering blunder. If these rules had been prepared in conjunction with the engineering authorities in the trade groups involved I am confident that the error complained of here would not have occurred.

There is also another advantage that must not be lost sight of in a discussion of uniform standards in the several States and that should be given consideration. Frequently when State enforcing authorities insist on an industry putting in expensive equipment, the plea is made that this kind of equipment is not required in neighboring States—that is, competing States—and consequently, the employer who is required to spend this money is placed at a disadvantage in marketing

his product. While I have very little patience with the economics of this kind of plea, knowing as I do that sooner or later the consequences of improper working conditions will impose a serious burden on the industry of any State, still I feel that if we can induce States to adopt uniform procedure it will do much to sweeten the relations that should exist among employers, employees, and labor officials responsible for the enforcement of industrial rules.

Procedure That May Be Adopted

It may be that I am particularly enthusiastic about the work of the American Standards Association for the reason that for more than 20 years I have striven hard to encourage State officials to join in cooperative efforts for the development of standards of safety practice applicable in all States. Several years ago, the American Standards Association undertook the work of setting up a sectional committee to prepare a safety code for exhaust systems. It is not necessary to name the sponsor organization that previously undertook this work, beyond the fact that for a long time this committee endeavored to organize and then finally it dissolved and the work of setting up a sectional committee to prepare a safety code for exhaust systems was assumed by the International Association of Industrial Accident Boards and Commissions. I represent your organization on that committee and have been honored by being chosen chairman of it. It is important, therefore, that you should know just how active this committee has been and just what is being done to promote this important work. I am therefore going to give you the personnel of the sectional committee of the safety code for exhaust systems and such additional information as may be thought important to you.

Personnel of the Sectional Committee of the Safety Code for Exhaust Systems—29

Scope.—Safety standards for the construction and operation of apparatus for moving material by means of air currents. Applies particularly to those cases where dust, fumes, gases, or other deleterious or useless substances are formed or given off, at some point in a process, and from which they may be removed by blowing or suction, or by properly arranged hoods or ducts.

Sponsor.—International Association of Industrial Accident Boards and Commissions.

Chairman.—John Roach, deputy commissioner New Jersey Department of Labor, Trenton, N. J.

Secretary.—Cyril Alnsworth, assistant secretary American Standards Association, 29 West Thirty-ninth Street, New York City.

Organization represented	Name and business affiliation
American Foundrymen's Association.	T. W. Pangborn, president Pangborn Corporation, Hagerstown, Md.
Alternate.....	James Allen, assistant manager Industrial Engineering and construction department, International Harvester Co., 606 South Michigan Avenue, Chicago, Ill.
American Society of Heating & Ventilating Engineers.	Wm. M. Wallace II, 8908 One Hundred and Ninety-sixth Street, Hollis, Long Island.
American Society of Mechanical Engineers.	J. C. Hardigg, 39 Commerce Street, New York City.
Alternate.....	E. H. deConingh, Meuller Electric Co., 1583 East Thirty-fifth Street, Cleveland Ohio.

Organization represented	Name and business affiliation
Association of Manufacturers of Woodworking Machinery.	F. G. Walker, Jones Superior Machine Co., 1258 West North Avenue, Chicago, Ill.
Foundry Equipment Manufacturers Association.	S. C. Vessy, president W. W. Sly Manufacturing Co., 4700 Train Avenue, Cleveland, Ohio.
Alternate.....	V. E. Minich, president American Foundry Equipment Co., Mishawaka, Ind.
International Association of Governmental Labor Officials.	John Roach, New Jersey Department of Labor Trenton, N. J.
National Association of Mutual Casualty Companies.	S. E. Whiting, Liberty Mutual Insurance Co., 1100 Park Square Building, Boston, Mass.
National Bureau of Casualty and Surety Underwriters.	R. C. Stratton, Travelers Insurance Co., Hartford, Conn.
Alternate.....	W. M. Graff, director Safety Engineering Division, National Bureau of Casualty and Surety Underwriters, 1 Park Avenue, New York City.
National Electrical Manufacturers Association.	R. C. Allen, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.
Alternate.....	G. E. Sanford, General Electric Co., Schenectady, N. Y.
National Founders Association....	T. W. Pangborn, president Pangborn Corporation, Hagerstown, Md.
National Safety Council.....	J. C. Wilson, vice president Lumbermen's Mutual Insurance Co., 4750 Sheridan Road, Chicago, Ill.
Alternate.....	J. E. Culliney, manager of safety, Bethlehem Steel Co., Bethlehem, Pa.
United States Department of Agriculture, Bureau of Chemistry and Soils.	Hylton Brown, Chemical Engineering Division, Bureau of Chemistry and Soils, United States Department of Agriculture, Washington, D. C.
Alternate.....	Roy L. Hunt, United States Department of Agriculture, Washington, D. C.
United States Department of Commerce, Bureau of Mines.	W. P. Yant, superintendent Experiment Stations Division, United States Bureau of Mines, 4800 Forbes Street, Pittsburgh, Pa.
Alternate.....	Dan Harrington, chief Health and Safety Branch, United States Bureau of Mines, Washington, D. C.
United States Department of Labor	Roy Kelsey, 1308 Olney Street, Indianapolis, Ind.
United States Department of Labor, Bureau of Labor Statistics.	Swen Kjaer, United States Bureau of Labor Statistics, Washington, D. C.
United States Treasury Department, Bureau of the Public Health Service.	J. J. Bloomfield, sanitary engineer United States Public Health Service, Washington, D. C.
Alternate.....	J. M. DalleValle, sanitary engineer United States Public Health Service, Washington, D. C.
Members at large.....	L. A. DeBlois, Consulting engineer, 15 West Eleventh Street, New York City.
	Prof. Philip Drinker, School of Public Health, Harvard University, 55 Shattuck Street, Boston, Mass.
	Dr. Leonard Greensburg, John B. Pierce Laboratory of Hygiene, Yale University, New Haven, Conn.
	Dr. William J. McConnell, assistant medical director Metropolitan Life Insurance Co., 1 Madison Avenue, New York City.

Progress of Work

While I realize that much of this report may have a prosy tinge, still in order for you to understand the progress of the work you have undertaken by your sponsorship, it has been necessary to set it forth in detail. At a meeting of the committee, June 11, 1934, active steps were taken to develop the machinery that would accomplish our purpose. At a previous meeting a subcommittee on plan and scope had been appointed. This committee gave very careful attention to the matter under consideration and presented eight general recommendations:

1. *The general nature of the project.*—Its relationship to the general question of occupational disease.

2. *Committee on toxicology.*—It was recommended that a committee of eminent toxicologists be appointed for consulting purposes.

3. *Scope.*—The scope should be limited to standards for the design, operation, and maintenance of equipment to provide a safe atmosphere by removing harmful substances from their point of production or issuance and by safely disposing of such substances.

4. *Method of developing health standards.*—It was agreed that a series of standards covering specific health hazards relating to particular industries or processes be developed.

5. *Standards to be recommended to sectional committee on which work can be commenced immediately*—(a) Abrasive cleaning; (b) Chromium plating; (c) Granite cutting; (d) Rock drilling; (e) Spray coating.

6. *Fundamental principles.*—It was agreed that a subcommittee of experience be appointed on fundamental principles on design, operation, and maintenance of exhaust systems.

7. *Research problems.*—It was agreed that a special committee be created to study questions relating to financial support for research of an engineering nature. It was thought this committee was necessary, owing to certain discussions that were had that seemed to show a lack of engineering data that would be necessary to enable the sectional committee to prepare standards that would be technically sound.

8. *National advisory committee on toxicology.*—In view of the fact that the work on hand involves the development of certain industrial health standards, it was thought absolutely essential to the success of this undertaking that a special advisory committee of toxicologists be created to assist the exhaust code committee. It was felt that sound toxicological data is essential to the work of other sectional committees now operating under American Standards Association procedure. It was thought that this kind of committee could establish threshold limits on dust exposure, for manifestly in designing an exhaust system it would be necessary to determine not only how much dust should be taken away, but how little dust should be left in a breathing atmosphere.

Your committee will continue this work until it has been completed, although I feel that, after looking over the field, the problems that will be met by the exhaust code committee will not be solved readily, but that this committee probably is facing several years of active work. If any member of the association desires a complete record of procedure adopted, it can be had by addressing a letter to Mr. Cyril Ainsworth, assistant secretary American Standards Association, 25 West Thirty-ninth Street, New York City.

DISCUSSION

Chairman MEADE. I am sure that Mr. Vogt will be glad to answer any questions about the rules, or the principles, or the general work of that committee which worked for the American Standards Association.

Mr. GERNON. Regarding the purport of Mr. Roach's paper, I just want to mention this: I have no objection to this committee doing this work, but I happened to be on those standards committees myself, and they do not work so fast. It seems to me that it would be far better to ask the States to have legislation passed that would accomplish something. One of the difficulties we have is indicated in the pictures of ventilating laundries that Mr. Vogt showed. The standards have been set up, and the Lord knows why we have to test them two different periods in the year in order to prove whether or not they are complete. We are required to give a license, but we cannot do that because we have to wait 6 months to make the second test. The law is good enough in one respect. It says that the dust-removing machinery shall remove the dust, and it says all dust from machinery shall be removed. That is as good as we want. When it comes to dust and fumes created outside of machinery, they must be removed if they tend to injure the employees, and that is where our trouble comes.

Chairman MEADE. We have to make proof.

Mr. GERNON. When we try to make proof we get into a position where we seldom prove anything. It is all right for this committee to set up standards. We know pretty well what our industrial diseases are. We know what substances in industry are injurious. We know that dust is not doing people any good, and so our law, so far as machinery is concerned, of course is ideal. It says dust shall be removed.

The greatest difficulty we have in exhaust work is the contractor who thinks he knows his business, and does not want to submit his work to the department of labor because he thinks he knows more than we do. This man may be an excellent fellow but his experience is confined to certain kinds of work. We have a lot of experience in this work because we have been doing it for a long time and we have run onto a lot of different conditions. Then we have a great range of people who take the work away from this good fellow and yet know nothing about it and could not design an exhaust system for the other fellow's plant. If this committee can work out those difficulties as to the particular changes we need, or the best method of carrying them out, we will be very glad. The law should say that it must be carried out; that is what we need in the law.

What do we find in the development of codes? We find that in some States they try to weaken the code. The code does weaken the law. It is the easiest thing in the world to make rules, but it is another proposition to enforce them. It is the easiest thing in the world to put something in print, but when you come to making an employer spend his money for it you are up against a real test. In New York we pride ourselves on taking this stand, that we want the dust removed, and we will show the employer the easiest way to remove it. We will not argue about the cost—he will argue that; but no matter what it costs, if the employer creates a dust condition he ought to be compelled to remove it.

Chairman MEADE. Mr. Gernon has put his finger on many of the difficulties that confront us in the administration of the law as it affects this problem.

[Meeting adjourned.]

Appendixes

Appendix A.—Officers and Members of Committees for 1934-35

President, J. Dewey Dorsett, Industrial Commission, Raleigh, N. C.
Secretary-Treasurer, Verne A. Zimmer, Division of Labor Standards, Department of Labor, Washington, D. C.

EXECUTIVE COMMITTEE

J. Dewey Dorsett	G. Clay Baker, Kansas
Verne A. Zimmer	Stephen B. Sweeney, Pennsylvania
Joseph A. Parks, Massachusetts	F. W. Armstrong, Nova Scotia
Parke P. Deans, Virginia	T. M. Gregory, Ohio

COMMITTEE ON STATISTICS

Sidney W. Wilcox, District of Columbia, <i>Chairman</i>	O. A. Fried, Wisconsin
Albert E. Brown, Maryland	James A. T. Gribbin, New Jersey
Neils M. Debel, Minnesota	L. W. Hatch, New York
E. I. Evans, Ohio	E. B. Patton, New York
	Mrs. Espa Stanford, Texas

MEDICAL COMMITTEE

Dr. W. C. Horton, North Carolina, <i>Chairman</i>	Dr. I. K. Ferguson, Pennsylvania
Dr. D. E. Bell, Ontario	Dr. LeRoy U. Gardner, New York
Dr. Francis D. Donoghue, Massachusetts	Dr. Phillip H. Kreuzscher, Illinois
Dr. James J. Donohue, Connecticut	W. J. McConnell, New York
Dr. H. H. Dorr, Ohio	Dr. George Mehler, New York
	Dr. R. R. Sayers, District of Columbia

LEGISLATIVE COMMITTEE

Abel Klaw, Delaware, <i>Chairman</i>	Edgar C. Nelson, Missouri
Peter J. Angsten, Illinois	Stephen B. Sweeney, Pennsylvania
Donald D. Garcelon, Maine	G. W. Suppliger, Idaho
Howard Keener, Arizona	R. H. Walker, North Dakota
O. F. McShane, Utah	

ELECTRICAL SAFETY CODE COMMITTEE

Charles H. Weeks, New Jersey, <i>Chairman</i>	C. P. Keogh, New York
J. Fred Cherry, Virginia	A. H. Meier, Indiana
L. L. Elden, Massachusetts	J. E. Wise, Wisconsin

FORMS COMMITTEE

Hal M. Stanley, Georgia, <i>Chairman</i>	M. J. Murphy, New York
Miss R. O. Harrison, Maryland	H. A. Nelson, Wisconsin
Swen Kjaer, District of Columbia	W. H. Nickels, Jr., Virginia
Albert G. Mathews, West Virginia	Emina S. Tousant, Massachusetts
Charles B. Morgan, Wyoming	

SAFETY AND SAFETY CODES COMMITTEE

Thomas P. Kearns, Ohio, <i>Chairman</i>	R. B. Morley, Ontario
C. H. Fry, California	John Roach, New Jersey
A. B. Funk, Iowa	Ira M. Stouffer, Indiana
O. R. Hartwig, Oregon	Paul F. Stricker, District of Columbia
E. Pat Kelly, Washington	

REHABILITATION COMMITTEE

Mark M. Walter, Pennsylvania, <i>Chairman</i>	Dan J. Sullivan, Nevada
Dr. Henry H. Kessler, New Jersey	Mrs. Jewell W. Swofford, District of Columbia
H. L. Stanton, North Carolina	Voyta Wrabetz, Wisconsin

HONORARY LIFE MEMBERS

(Former Presidents)

- 1914-15 John E. Kinnane, Detroit, Mich.
 1915-16 { Floyd L. Daggett, Spokane, Wash. (deceased)
 { Wallace D. Yapple, Columbus, Ohio
 1916-17 Dudley M. Holman, Massachusetts
 1917-18 F. M. Wilcox, Madison, Wis.
 1918-19 Geo. A. Kingston, Toronto, Canada
 1919-20 Will J. French, San Francisco, Calif.
 1920-21 Charles S. Andrus, Springfield, Ill.
 1921-22 Robert E. Lee, Maryland (deceased)
 1922-23 F. A. Duxbury, St. Paul, Minn. (deceased)
 1923-24 Fred W. Armstrong, Halifax, Nova Scotia
 1924-25 O. F. McShane, Salt Lake City, Utah
 1925-26 Frederic M. Williams, Waterbury, Conn. (deceased)
 1926-27 H. M. Stanley, Atlanta, Ga.
 1927-28 Andrew F. McBride, M. D., Paterson, N. J.
 1928-29 { James A. Hamilton, New York, N. Y.
 { Frances Perkins, New York, N. Y.
 1929-30 Dr. Walter O. Stack, Wilmington, Del.
 1930-31 Parke P. Deans, Richmond, Va.
 1931-32 Wellington T. Leonard, Columbus, Ohio
 1932-33 R. E. Wenzel, Bismarck, N. Dak.
 1933-34 Joseph A. Parks, Boston, Mass.

(Former Secretaries)

- 1914-15 Richard L. Drake, Highland Park, Mich.
 1915-16 L. A. Tarrell, Milwaukee, Wis.
 1916-20 Royal Meeker, New Haven, Conn.
 1920 Charles H. Verrill, Washington, D. C. (deceased)
 1921-32 Ethelbert Stewart, Washington, D. C., Secretary-Treasurer Emeritus
 1932-34 Chas. E. Baldwin, Washington, D. C.

ACTIVE MEMBERS

United States Bureau of Labor Statistics
 United States Employees' Compensation Commission
 Arizona Industrial Commission
 California Department of Industrial Relations
 Connecticut Board of Compensation Commissioners
 Georgia Department of Industrial Relations
 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

ACTIVE MEMBERS—continued

Missouri Workmen's Compensation Commission
 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
 Oregon State Industrial Accident Commission
 Pennsylvania Department of Labor and Industry
 Utah Industrial Commission and State Insurance Fund
 Virginia Department of Workmen's Compensation, 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

ASSOCIATE MEMBERS

American Mutual Liability Insurance Company, Boston, Mass.
 W. F. Ames, Bethlehem Steel Company, Bethlehem, Pa.
 R. M. Crater, American Telephone and Telegraph Co., New York, N. Y.
 Walter F. Dodd, 33 N. LaSalle Street, Chicago, Ill.
 E. I. du Pont de Nemours Co., Inc., Wilmington, Del.
 Arthur Gaboury, General Manager, Quebec Association for Prevention of
 Industrial Accidents, Montreal
 Industrial Accident Prevention Associations, Toronto, Ontario
 Leifur Magnusson, American Representative, International Labor Office,
 Washington, D. C.
 National Council on Compensation Insurance, New York, N. Y.
 Pennsylvania Self-Insurers' Association, P. O. Box 849, Harrisburg, Pa.
 Puerto Rico Industrial Commission
 William Schobinger, London Guarantee and Accident Co., New York, N. Y.

Appendix B.—Constitution of the International Association of Industrial Accident Boards and Commissions

Revision of September 27, 1934

ARTICLE I

This organization shall be known as the International Association of Industrial Accident Boards and Commissions.

ARTICLE II—*Objects*

The object of the association is to bring representatives of the various jurisdictions together at least once a year to discuss the problems and experiences arising out of the administration of workmen's compensation laws.

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, self-insurer or association of self-insurers or individuals actively interested in any phase of workmen's compensation 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 all 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 within the definition of membership.

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.

SEC. 2. Associate member organizations, self-insurers, or associations of self-insurers shall pay \$50 per annum, except as hereinafter provided. Individual associate members shall pay \$10 per annum, except as hereinafter provided.

SEC. 3. Annual dues are payable on or before July 1, of each year, 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.

SEC. 4. It shall be within the power of the officers and executive committee to change the dues payable by any class of members, provided the maximum shall not exceed the amount stated in this article and that such changes shall be for but 1 year.

ARTICLE VI—Officers

SECTION 1. The officers of this association shall be a president, vice president, and secretary-treasurer. Only officials having to do with the administration of a State workmen's compensation law or bureau of labor may hold the office of president or vice president in this association, except as hereinafter provided.

SEC. 2. If for any reason the president or vice president of this association, during the term for which he was chosen, should cease to be an official of any agency entitled to active membership, he may serve out his term of office in this association. But if for any reason a vacancy occurs, the executive committee shall appoint a successor for the remainder of the term.

SEC. 3. The president, vice president, secretary-treasurer, and members of the executive committee shall be elected at the annual meeting of the association and shall assume office at the last session of the annual meeting.

ARTICLE VII—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; 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. A quorum of the executive committee shall consist of at least four persons, the president or the vice president, or the representative of one of these, the secretary-treasurer or his representative, and two other members of the executive committee.

ARTICLE VIII—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, referred to a special committee, and cannot be voted upon during the same day in which it was introduced. A two-thirds vote of the members present and voting is required to change the constitution.

Appendix C.—List of Persons Who Attended the Twenty-first Annual Meeting of the International Association of Industrial Accident Boards and Commissions, Held at Boston, Mass., September 24–27, 1934

CANADA

New Brunswick

John A. Sinclair, Workmen's Compensation Board, St. John.
John A. Sullivan, St. John.

Nova Scotia

Fred W. Armstrong, Workmen's Compensation Board, Halifax.

Ontario

Mrs. Walter Evans, Toronto.
George A. Kingston, workmen's compensation board, Toronto.
George A. Kingston, Workmen's Compensation Board, Toronto.
Miss Helen Kingston, Toronto.
R. B. Morley, Industrial Accident Prevention Association, Toronto.

UNITED STATES

Arizona

Howard Keener, Industrial Commission, Phoenix.

Connecticut

James J. Donohue, M. D., Board of Compensation Commissioners, Norwich.
Mrs. James J. Donohue, Norwich.
Frank M. Dunn, M. D., New London.
Mrs. Frank M. Dunn, New London.
George G. Hubbard, Scovill Mfg. Co., Waterbury.
John H. Leonard, Norwich.
Frederick B. Merrels, Travelers Insurance Co., Hartford.
John R. Quinley, supervisor vocational rehabilitation, Hartford.

Delaware

C. W. Dickey, E. I. Du Pont de Nemours & Co., Inc., Wilmington.
Abel Klaw, E. I. Du Pont de Nemours & Co., Inc., Wilmington.
Walter O. Stack, ex-president I. A. I. A. B. C., Wilmington.

District of Columbia

William M. Aicher, Federal Emergency Relief Administration
Charles E. Baldwin, secretary-treasurer, I. A. I. A. B. C.
Marshall Dawson, United States Bureau of Labor Statistics.
Edward C. Ernst, M. D., United States Employees' Compensation Commission.
Swen Kjaer, United States Bureau of Labor Statistics.
William H. McOwen, M. D., United States Employees' Compensation Commission.
Mrs. Margaret T. Mettert, United States Women's Bureau.
Charles F. Sharkey, United States Bureau of Labor Statistics.

Ethelbert Stewart, secretary-treasurer emeritus I. A. I. A. B. C.
Mrs. Jewell W. Swofford, United States Employees' Compensation Commission.

Mrs. Glenn L. Tibbott, United States Bureau of Labor Statistics.
Sidney W. Wilcox, United States Bureau of Labor Statistics.

Idaho

G. W. Suppiger, Industrial Accident Board, Boise.

Illinois

Peter J. Angsten, Industrial Commission, Chicago.
Anton B. Johannsen, industrial commission, Chicago.
Miriam Noll.

Indiana

Edgar A. Perkins, Sr., Industrial Board, Indianapolis.

Iowa

A. B. Funk, Industrial Commissioner, Des Moines.
Frank E. Wenig, bureau of labor statistics, Des Moines.

Kansas

G. Clay Baker, Commission of Labor and Industry, Topeka.
Mrs. Loraine Edmonds, Commission of Labor and Industry, Topeka.
Mrs. Daisy L. Gullick, Commission of Labor and Industry, Topeka.

Maine

Donald D. Garcelon, Industrial Accident Commission, Augusta.
Mrs. Donald D. Garcelon, Augusta.
Miss Helen N. Hanson, Industrial Accident Commission, Augusta.
Earle L. Russell, Industrial Accident Commission, Augusta.
Mrs. Earle L. Russell, Augusta.

Maryland

Miss Rowena A. Harrison, State Industrial Accident Commission, Baltimore.

Massachusetts

Albert G. Aggott, American Mutual Liability Insurance Co., Boston.
Roger H. Ames, American Mutual Liability Insurance Co., Boston.
Earle E. Andrews, Lumbermen's Mutual Casualty Co., Boston.
Bernard Appel, M. D., Boston.
Robert E. Barry, Brookline.
C. W. Bergstrom Arcade Malleable Iron Co., Worcester.
G. A. Buckley, M. D., Brockton.
James J. Buckley, Electric Mutual Liability Insurance Co., Lynn.
Edwin W. Bullock, M. D., Chas. H. Tenny Co., Boston.
B. T. Burley, M. D., Worcester.
Clarence E. Burt, M. D., New Bedford.
Alfred B. Cenedella, Department of Industrial Accidents, Boston.
Mrs. Alfred B. Cenedella, Boston.
Edward E. Clark, Department of Industrial Accidents, Boston.
Mrs. Edward E. Clark, Boston.
Abbott S. Coan, American Mutual Liability Insurance Co., Boston.
Donald W. Coan, American Mutual Liability Insurance Co., Boston.
G. W. Colburn, Graton & Knight Co., Worcester.
M. M. Connell, American Mutual Liability Insurance Co., Boston.
Robert H. Cooney, American Mutual Liability Insurance Co., Boston.
Robert W. S. Cox, American Mutual Liability Insurance Co., Boston.

William Doyle, Liberty Mutual Insurance Co., Boston.
 Frank M. Dunn, New London.
 James Farrell, Department of Industrial Accidents, Boston.
 Mrs. Nellie Finigan, Boston.
 Thomas N. Foynes, Electric Mutual Liability Insurance Co., Lynn.
 Chester E. Gleason, Department of Industrial Accidents, Boston.
 Mrs. Chester E. Gleason, Boston.
 Mrs. Robert E. Grandfield, Boston.
 James C. Graves, Jr., Travelers Insurance Co., Boston.
 Fred L. Green, American Mutual Liability Insurance Co., Boston.
 Cora B. Gross, M. D., Boston.
 Roy E. Hatfield, Massachusetts Rating & Inspection Bureau, Boston.
 John W. Henderson, Department of Industrial Accidents, Boston.
 Mrs. John W. Henderson, Boston.
 Dudley M. Holman, ex-president I. A. I. A. B. C., Quincy.
 J. Hopkins, industrial engineer, Boston.
 Samuel B. Horowitz, Boston.
 Robert E. Hunt, Hartford Accident & Indemnity Co., Boston.
 L. S. Jenks, American Mutual Liability Insurance Co., Boston.
 Myron B. Jonsberg, J. C. Paige & Co., Boston.
 John F. Keating, Hartford Accident & Indemnity Co., Boston.
 Joseph E. Kehoe, Massachusetts Bonding & Insurance Co., Boston.
 W. F. Kennedy, General Electric Co., Pittsfield.
 Howard S. Knowlton, N. E. editor Electrical World, Boston.
 F. H. Lally, M. D., Milford.
 George E. Leeper, American Mutual Liability Insurance Co.
 Harper G. Lewis, Jr., Maryland Casualty Co., Boston.
 R. D. MacLean, American Mutual Liability Insurance Co., Boston.
 Thomas J. McElaney, Lumbermen's Mutual Casualty Co., Boston.
 Thomas A. McGehearty, Liberty Mutual Insurance Co.
 Eugene H. McLaughlin, American Mutual Liability Insurance Co., Boston.
 J. A. McQueen, American Mutual Liability Insurance Co., Boston.
 G. Lester Marston, American Mutual Liability Insurance Co., Boston.
 Stephen Merrick, American Mutual Liability Insurance Co., Boston.
 P. J. Monahan, U. S. Employees' Compensation Commission, Boston.
 Mrs. P. J. Monahan, Boston.
 John J. Mulcahy, Hartford Accident & Indemnity Co., Boston.
 Mrs. William Mulcahy, Boston.
 Joseph A. Murphy, Travelers Insurance Co., Boston.
 J. Frank Murray, United Electric Light Co., Springfield.
 James E. O'Brien, Lumbermen's Mutual Casualty Co., Boston.
 E. A. Osborn, Travelers Insurance Co., Boston.
 Joseph A. Parks, Department of Industrial Accidents, Boston.
 Mrs. Joseph A. Parks, Boston.
 Mrs. S. H. Parshley, Royal Indemnity Co., Boston.
 Ralph W. Pendleton, Massachusetts Safety Council, Boston.
 M. S. Porter, Maryland Casualty Co., Boston.
 Mrs. Louise Powers, Fall River.
 J. Frank Scannell, Lumbermen's Mutual Casualty Co., Boston.
 Arthur E. Sheerin, Employees' Liability Assurance Corporation, Ltd., Boston.
 John J. Shruhan, Royal Indemnity Co., Boston.
 John F. Smith, Transit Mutual Insurance Co., Boston.
 Carl W. Sternfelt, J. C. Paige Co., Boston.
 M. A. Stammer, M. D., Boston.
 Daniel J. Sullivan, Department of Industrial Accidents, Boston.
 Mrs. Daniel J. Sullivan, Lawrence.
 Mrs. Emma S. Tousant, Department of Industrial Accidents, Boston.
 D. E. Whelton, Maryland Casualty Co., Boston.
 Stuart A. Wickerson, American Mutual Liability Insurance Co., Boston.
 Herbert E. Williams, American Mutual Liability Insurance Co., Boston.
 Harry Woodard, Merchants Mutual Casualty Co., Boston.

Michigan

Daniel J. O'Connor, Department of Labor and Industry, Lansing.

Minnesota

N. H. Debel, Industrial Commission, St. Paul.
 J. D. Williams, Industrial Commission, St. Paul.
 Mrs. J. D. Williams, St. Paul.

New Hampshire

John S. B. Davie, Bureau of Labor.
 Miss Jessie Doe, Bureau of Labor.
 Miss Ethel Johnson, Minimum Wage Office.

New Jersey

Charles H. Weeks, Department of Labor, Trenton.

New York

Cyril Ainsworth, American Standards Association, New York.
 John B. Andrews, American Association for Labor Legislation, New York.
 Mrs. John B. Andrews, New York.
 Robert M. Crater, New York.
 Richard Fondiller, New York.
 James L. Gernon, Department of Labor, New York.
 W. H. Quirk, Western Electric Co., New York.
 H. F. Richardson, National Council on Compensation Insurance, New York.
 William Schobinger, London Guaranty & Accident Co., New York.
 John H. Vogt, Department of Labor, New York.

North Carolina

J. Dewey Dorsett, Industrial Commission, Raleigh.
 J. Harrington Rich, press, Winston-Salem.
 John C. Root, Industrial Commission, Raleigh.

North Dakota

R. H. Walker, Workmen's Compensation Bureau, Bismarck.

Ohio

Herbert D. Bangert, Columbus.
 Carl C. Beasor, Industrial Commission, Columbus.
 E. I. Evans, Industrial Commission, Columbus.
 Miss Loretta Fitzsimmons, Jarvis & Fisher, Inc., Columbus.
 Thomas M. Gregory, Industrial Commission, Columbus.
 Thomas P. Kearns, Industrial Commission, Columbus.
 Wellington T. Leonard, ex-president I. A. I. A. B. C.
 W. E. Obetz, M. D., Industrial Commission, Columbus.
 Miss Helen C. Simons, Columbus.
 Emile B. Watson, Columbus.

Oregon

O. R. Hartwig, Industrial Accident Commission, Salem.

Pennsylvania

W. F. Ames, Bethlehem Steel Co., Bethlehem.
 William H. Horner, Pennsylvania Self Insurers' Association, Harrisburg.
 Mrs. William H. Horner, Harrisburg.
 Walter Linn, Pennsylvania Self Insurers' Association, Philadelphia.
 Stephen B. Sweeney, Bureau of Workmen's Compensation, Harrisburg.
 A. L. Watson, Koppers Co., Pittsburgh.

Texas

Mrs. Espa Stanford, Industrial Accident Board, Austin.

Virginia

Mrs. F. H. Ashlin, Richmond.
Parke P. Deans, Department of Workmen's Compensation, Richmond.
Mrs. Parke P. Deans, Richmond.
Mrs. M. L. Fendley, Richmond.
Miss Selina J. Greene, Richmond.
O. V. Hanger, clerk, State senate, Richmond.
Mrs. O. V. Hanger, Richmond.
B. D. White, judge of circuit court, Norfolk.
Mrs. B. D. White, Norfolk.

West Virginia

J. B. Banks, M. D., Workmen's Compensation Department, Charleston.
R. H. Giles, Workmen's Compensation Department, Charleston.
George T. Watson, Workmen's Compensation Department, Charleston.

Wisconsin

Taylor Frye, Industrial Commission, Madison.
R. G. Knutson, ex-member Industrial Commission, Stevens Point.
Voyta Wrabetz, Industrial Commission, Madison.

Wyoming

Mabel C. Knapp, Workmen's Compensation Department, Cheyenne.
Charles B. Morgan, Workmen's Compensation Department, Cheyenne.
Kathryn G. Moran, Cheyenne.

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