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WORKMEN'S INSURANCE AND COMPENSATION SERIES

PROCEEDINGS OF THE FIFTH ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS

HELD AT MADISON, WIS.
SEPTEMBER 24-27, 1918

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PROCEEDINGS OF THE FIFTH ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS, MADISON, WIS., SEPTEMBER 24-27, 1918.

[The present bulletin contains only those papers which were prepared for the conference and submitted to the Bureau. No stenographic report of the proceedings has been received by the Bureau of Labor Statistics for publication. The following introduction gives a summary account of the papers, discussions, and activities of the conference.]

INTRODUCTION.

The International Association of Industrial Accident Boards and Commissions held its fifth annual meeting September 24–27, 1918, at Madison, Wis. Seventeen States, two Provinces of Canada, and five Federal departments were represented. The last named included the United States Bureau of Labor Statistics, United States Employees' Compensation Commission, Federal Board for Vocational Education, Bureau of Standards, and the Surgeon General's Office of the War Department. An address of welcome was delivered by the Hon. Emanuel L. Philipp, Governor of Wisconsin.

The discussion centered about five main subjects: Accident prevention; methods of compensating for partial disabilities; statistics and statistical methods as an aid in efficient administration; medical problems, including the method of selecting physicians; and the problem of rehabilitation and retraining.

In his presidential address, Mr. Fred M. Wilcox, of the Wisconsin Industrial Commission, emphasized the necessity of greater uniformity in compensation practices, especially as regards partial disability schedules. He also advocated unlimited medical and hospital treatment, urged the adoption of State compensation insurance, and emphasized the importance of closer personal supervision of accident cases.

The opening session of the convention was devoted to brief State reports on important legislative and administrative developments during the year. An important instance of effective cooperation was given by Mr. J. L. Gernon, first deputy commissioner of the New York State Industrial Commission. A great many of the small employers subject to the compensation act in New York had not insured in accordance with the law, and it had been practically impossible for the commission to canvass the entire State for violations of this sort. Now one of the duties of the factory inspectors is to inquire whether employers are insured under the compensation act. Violations are reported to the compensation bureau and then prosecuted. Mr. F. W. Armstrong, of Nova Scotia, stated that 75 per cent of the troubles of compensation commissions would be eliminated if an exclusive State fund were substituted for private casualty companies. He also advised strongly against payment of compensation benefits in lump sums, stating that 90 per cent of such lump-sum payments are actually wasted.

ACCIDENT PREVENTION.

The entrance of large numbers of women into war industries has necessitated a change in the character of accident prevention methods. Machines and processes not particularly hazardous when men are employed become so when such machines are operated by woman. Even the mechanical safeguards themselves, installed primarily for the protection of male employees, are a source of danger to women workers. Another prolific source of accidents, as pointed out by Mr. Gernon, of New York, is the lack of proper instruction in the use or technique of tools. The greater liability to accident of the inexperienced or "green" employee is due not to his carelessness but to his ignorance of the proper methods of performing his work. This unfamiliarity has become a very potent factor in view of the present large labor turnover and the employment of thousands of new and inexperienced workers.

Some of the accident prevention methods found effective in the various States were discussed at the conference. The more salient features are shown in the following summaries of the papers read.

Mr. Emile E. Watson, actuary of the Industrial Commission of Ohio, presented the plan in effect in that State.

An account of the safety work in Wisconsin was given by Mr. G. H. Hambrecht, chairman of the Wisconsin Industrial Commission. One method of interesting employers in inaugurating intensive safety campaigns is to study the accident experience in their plants and furnish the deputies with this data. The compensation

law itself is an aid to the safety movement. When an injury is due to failure of an employer to comply with any safety order the compensation of the injured is increased 15 per cent, to be paid by the employer himself, and when an injury is due to violation of an order by the injured the employee's compensation is reduced 15 per cent. Accidents are carefully investigated on this basis, and the result has been to create a demand for copies of safety orders.

The safety department of the Industrial Accident Commission of California, as outlined by Mr. J. R. Brownell, superintendent of safety, was organized in 1914 with a nucleus of safety engineers and now consists of 22 members. The chief mine inspector is paid jointly by the Federal Government and the commission through an arrangement with the Federal Bureau of Mines, by which he is also employed. The following accident prevention methods have been found useful: Development of safety organizations among employers; preparation and distribution of safety rules and orders; mass meetings and shop talks to employees; issuance of bulletins dealing with special hazards in different industries; a safety museum; and the publication of a monthly safety news bulletin.

Particular emphasis upon the necessity of instructing inexperienced employees in the use of tools and methods was laid down by Mr. J. L. Gernon, of the New York State Industrial Commission. He further stated that the inspection bureau is empowered to tag as unsafe machines which are dangerous and unguarded, and this has proved a most effective means of securing compliance with the orders issued. Considerable success has been achieved by the bureau in the policy of requiring every inspector to report all installations of new machinery where the machinery itself is dangerous and the manufacturer has failed properly to safeguard it. When called to their attention the makers of the machinery have in every instance signified their intention to remedy the defects and have cooperated with the bureau in an effort to make their machinery safe for the operator.

Mr. Victor T. Noonan, director of safety of Ohio, emphasized the human element in accident prevention work. The war, he said, had given the safety movement a much needed stimulus. Employers and workmen alike must consider it their patriotic duty to do everything possible to prevent accidents.

Mr. S. J. Williams, manager of the accident prevention division of the National Safety Council, spoke of the need of uniform safety standards. He stated that a proper balance between safeguarding and education should be maintained in any safety campaign, since education reduces accident frequency and safeguarding prevents many of the more serious accidents.

PARTIAL DISABILITY SCHEDULE.

The formulation of an adequate and just compensation schedule for partial disabilities is a problem which is still confronting every State legislature and compensation commission. No two schedules are alike and none is adequate. This inadequacy is particularly noticeable as to foot and leg injuries. As was pointed out by Mr. Carl Hookstadt, of the United States Bureau of Labor Statistics, in every State compensation law the schedule provides smaller benefits for the loss of the lower limbs than for the loss of the upper limbs. Yet every investigation shows that from both the medical and economic standpoint the loss of the former are more severe than the loss of the latter.

On what basis permanent partial disability should be compensated was discussed in a paper prepared by Mr. John Mitchell, chairman of the Industrial Commission of New York. He stated that in the administration of the New York law consideration has been given to the vocational element to modify the rigidity of the statute, in no case, however, diminishing the award on this account, but it might be advisable to allow a definite increase of, say, 33⅓ per cent for vocational reasons alone. Under an amendment to the New York law compensation for permanent total disability is awarded in cases in which the claimant loses a hand, arm, foot, leg, or eye, having previously suffered the loss of one or more such members. The totality is no more chargeable to the last accident than to the first. The proper way to handle such a matter would seem to be to charge the present employer with the result of the last accident and to throw the combination result of the totality upon the industry as a whole. This may be done by adding a small additional rate upon each risk or by collecting, as New York has done, in each death case in which there are no dependents, a fixed sum of $100, which contribution has been sufficient to establish a fund to take care of the permanent total cases. This has done away with the objection of employers to employing or reemploying crippled or defective workmen.

The statutory method of providing for permanent partial disabilities not included in the schedule is to pay two-thirds of the difference between the old and the new wages, but the administration difficulties are numerous. The claimant may refuse to return to work; changed industrial conditions may cause the claimant to earn more or less than he earned at the time of the accident; the claimant may experience intermittent employment—sometimes employed and sometimes not. The method followed in New York in such cases is to allow the workman and the employer (or his insurance carrier) to present themselves before the commission with a proposition to adjudicate compensation by a single payment commuting all future payments. More than

5,000 such cases a year are thus adjusted. The chief defects of such a plan are (1) the danger of introducing the "settlement," so called, in which the obnoxious element of the old plan may be perpetuated and (2) the danger which always attends the giving of compensation in a lump sum against which is the general tendency of compensation laws. The first objection is entirely avoided by the commission's active interest in every case. The second defect is overcome largely by ordering partial payments of the lump sum to be made periodically where there is indication that it otherwise might be wasted.

STATISTICAL METHODS.

Mr. W. H. Burhop, of the Wisconsin Compensation Insurance Board, discussed the standard accident and compensation tables used by the industrial commission, and pointed out the importance of proper statistics as an aid in administration.

The paper of Mr. L. W. Chaney, of the United States Bureau of Labor Statistics, emphasized the need of information as to exposure in the determination of relative industrial hazards. Accident rates always have significance as disclosing prevalence; while in the matter of hazard the significance is slight in extended groups such as the entire State, but steadily increases as it narrows to industries, departments, and finally to occupations. Mr. Chaney also discussed the several methods which may be adopted to ascertain the amount of exposure in any industry, the most accurate method being the use of actual hours as recorded by time clocks.

Mr. L. W. Hatch, chief statistician of the New York State Industrial Commission, in his discussion of noncompensable accidents stated that while such accidents should be reported, very little could be gained by tabulating them. The results obtained would not be commensurate with the great labor and cost involved.

MEDICAL SERVICE.

The medical session proved to be one of the most spirited and interesting features of the convention. A description of the medical administration and practices in each State opened the session. Every speaker emphasized the importance of medical and surgical treatment which was unlimited both as regards time and amount. Nothing short of this was held to be adequate. Too great a tendency on the part of employers and insurance carriers to select cheap and incompetent physicians was also pointed out. The practices of many of the contract doctors were especially condemned by Maj. P. B. Magnuson, of the Surgeon General's Office, and by Dr. C. H. Lemon, of Milwaukee. On the other hand, as pointed out by Dr. J. W. Mowell, of the State Medical Aid Board of Washington, selection of physicians by employees results in selection of incompetents in a large propor-

tion of cases. Supervision by State industrial commissions over the selection of physicians was suggested as the best way out of the difficult problem.

The invaluable aid medical advisers render to compensation commissions was generally recognized and emphasized. Not only do they advise the commissioners on technical medical problems, but they are especially qualified to select the impartial examining physicians. A valuable paper on how to prevent and minimize permanent disabilities of the hand was read by Dr. F. D. Donoghue. The long period of disability resulting from hand injuries, Dr. Donoghue stated, was due largely to neglect or improper treatment. Valuable papers were also read by Mr. Meyer Lissner, of the California Industrial Accident Commission, on preexisting disease aggravated by accident, and by Mr. Geo. A. Kingston, of the Ontario Workmen's Compensation Board, on the interpretation of injuries "arising out of and in course of employment."

REHABILITATION.

A discussion of rehabilitation problems closed the convention. Mr. T. N. Dean, statistician of the Workmen's Compensation Board of Ontario, spoke of the importance of rehabilitating industrial cripples and stressed the desirability of prompt action. Mr. Carl Hookstadt, of the United States Bureau of Labor Statistics, outlined the actual industrial problem, as disclosed by several investigations, confronting workmen permanently injured in industry. He pointed out that the present industrial handicap of a workman who sustains a major limb injury is a serious one. The period of total disability resulting from the injury is unnecessarily long. Only about one-third of the seriously crippled workers return to the same employer and relatively few reenter the same occupation. The compensation benefits are inadequate and practically no retraining has been done.

Mr. R. M. Little, former chairman of the United States Employees' Compensation Commission, outlined the history and progress of Federal rehabilitation legislation as regards both military and industrial cripples. He urged specifically that the association support the pending Smith-Bankhead bill providing for the rehabilitation of industrial cripples under the supervision and administration of the Federal Board for Vocational Education. Resolutions were adopted by the association approving the principle of the Smith-Bankhead bills and authorizing the president to appoint a committee to further State and Federal legislation along lines outlined in the said bills.

BUSINESS SESSION.

The following officers for the ensuing year were elected: President, George A. Kingston, commissioner, Workmen's Compensation Board of Ontario, Canada; vice president, Will J. French, member of the

Industrial Accident Commission of California; secretary-treasurer, Royal Meeker, United States Commissioner of Labor Statistics, Washington, D. C. Reports were made by the secretary-treasurer, by the committee on jurisdictional conflicts, and by the committee on statistics and compensation insurance cost. Among the resolutions adopted was one authorizing the executive committee to confer with the executive committee of the Association of Government Labor Officials of the United States and Canada as to the advisability of the consolidation of the two organizations. The executive committee was authorized to cooperate with the Federal Bureau of Standards in formulating a uniform safety code, and to study the question of uniformity in State compensation laws.

TUESDAY, SEPTEMBER 24—AFTERNOON SESSION.

CHAIRMAN, FRED M. WILCOX, PRESIDENT, I. A. I. A. B. C.

I. ACCIDENT PREVENTION.

OHIO'S PLAN OF REACHING THE EMPLOYER THROUGH MONTHLY STATISTICAL REPORTS.

BY EMILE E. WATSON, ACTUARY, OHIO INDUSTRIAL COMMISSION.

Our monthly statistical report plan comprises but one phase of a broader plan, the great function of which is intended to create that condition which will bring about a maximum reduction in industrial accidents in Ohio. With this statement in mind the initial part of this paper will be strictly confined to the subject assigned.

Statistically speaking, an industrial accident for actuarial needs is inherently different from an industrial accident for accident prevention needs. To serve actuarial needs, an industrial accident must have a matured value. To possess a matured value, an important percentage of accidents require a considerable exposure of time beyond the date on which the accident occurred. In consequence, actuarial needs demand that statistical compilations for actuarial purposes be made considerably beyond the date of the year for which the compilation was made.

This delay, however, is violently destructive considered from the viewpoint of accident prevention needs. In the first place, it will permit of the prolonged continuance of a destructive physical or moral hazard constituting the direct source of a prolific number of accidents. In the second place, the tendency of a corrective practice ultimately to start operation independent of external action, means, in a large percentage of cases, that the delay forced by actuarial needs will find an entirely different set of conditions existing than were present at the time of the occurrence of the accident, in the event the attempt is made to use actuarial statistics for accident prevention purposes.

To-day, when industries are so rapidly changing the nature, character, and finished product of their operations, and on such a large scale, this delay is incomparably more destructive than ever before.

Stated concisely, the proper conservation of accident prevention and actuarial statistical needs demands that industrial accidents be reduced to two points of control—one instantaneous, the other ultimate; the former being concurrent with the date of the reporting of the occurrence of the accident, the other concurrent with the date

the accident has reached its matured value. The latter will be of great constructive value to the former, but the former will be of no constructive value whatsoever to the latter.

In the foregoing an effort has been made to explain the conditions which made the adopting of our monthly statistical reports a necessity in order to reduce our problem to effective control. We have tried diligently to make this work (our monthly statistical reports) a procedure as simple as possible. In its beginning we have taken only a selected number of risks. It is our plan to extend this selection gradually until ultimately it will be a service universal to every employer of the State.

I consider it premature at this time to attempt to place a valuation upon this plan, though I have the profoundest confidence in the serviceable and effective results it will obtain. The detailed procedure of carrying out the plan is as follows:

1. The industrial accidents of each selected employer are analyzed as of the day the same are reported to the department, as to cause, nature, and as far as possible, extent of disability. They are coded, thus being made ready for punching on the Hollerith cards.

2. These codes are then punched on the Hollerith cards.

3. At the termination of the month these accidents are sorted and tabulated by their respective risks.

4. The results of these tabulations are then carried to the monthly statistical report form.

5. Copies of these reports are placed in the hands of our safety engineers, workshop and factory inspectors, and the employer.

Then correlating with the foregoing our merit-rating plan, we feel that we have completed a cycle which is ultimately going to go far toward reducing the industrial accidents in Ohio to a minimum.

Suffice it to say that the employers' insurance is renewed every six months. The employer is rated within his classification upon the basis of the experience he has produced. On renewal, if the employer finds he is penalized over his neighboring or competing employer within the same classification, he is always disappointed by reason of two things: (1) The dollars and cents loss, represented not only by the penalization but also by the additional fact that this penalization in itself bars the employer receiving the same from any participation in the annual refund premium; (2) injuring of his pride, which is frequently the greatest cause of disappointment. The Ohio employers are now conversant with the merit-rating system of the Ohio State Insurance Plan, and, when they get together and talk over the rates, it is a source of pride to every employer to be able to say that he is getting the preferred rate and participation in the refund premium.

THE UNIQUE CORRELATION EXISTING BETWEEN OUR MONTHLY STATISTICAL REPORTS AND MERIT RATING SYSTEM.

In Ohio, there is just one carrier of workmen's compensation insurance, viz, the Ohio State Insurance Plan. There is no switching from one insurance carrier to another.

We have diligently developed the merit-rating system of the Ohio State Insurance Plan to the specific end of creating that condition which makes the prevention of every preventable accident the convenient and businesslike thing for every subscriber to the fund to accomplish, our aim being to make it just as economically necessary for the employers to safeguard against the occurrence of a preventable accident to just the same degree that he finds it economically necessary to safeguard his raw material, machinery, equipment, and finished product against injury or damage.

It is hardly fitting to enter upon an analysis of the foregoing merit-rating system in this paper. The writer made such an analysis in a paper read before the 1916 annual meeting of this association. Since then, this merit-rating system has undergone a considerable number of revisions, calculated to produce more effectively the results just recited.

WHAT WISCONSIN IS DOING TO PREVENT INDUSTRIAL ACCIDENTS.

BY G. H. HAMBRECHT, CHAIRMAN, WISCONSIN INDUSTRIAL COMMISSION.

The Wisconsin Industrial Commission was organized seven years ago. From the very first, in formulating and carrying out its safety program, it has worked in the closest possible cooperation with the representatives of labor and the manufacturers. In its effort to be thoroughly efficient and practical in all of its requirements and methods, it has sought to do nothing on its own responsibility, but always to consult the interests concerned and, in cooperation with them, to work out standards along the lines of experience and good practice.

Every one of the safety orders now in force has been drafted by committees whose members are experts in the respective fields to which the orders apply. The personnel of the committees is made up of representatives of the manufacturers and members appointed by the Federation of Labor, and it is by such practical men as these that the safety orders in every instance have been prepared and discussed before being adopted as administrative orders by the commission.

These special committees were continued after the orders were adopted and are looked upon by the commission as permanent advisory committees to which the commission may turn for expert advice and technical information, and to which also may be referred difficult questions involving interpretation of the orders and their application under unusual circumstances.

From the very first, also, the commission has endeavored to be of service to the manufacturers of the State and their workmen by placing before them the best information attainable regarding safeguards and methods of accident prevention. Throughout the entire course of development of its safety work the commission has sought to impress upon the employers and workmen the fact that safety is neither philanthropy nor "bunk," but that it is a necessary feature of industrial organization and that there can be no efficiency without safety.

The field inspectors have been practical men who have sought to do their work in a practical manner. In every case where a safeguard has been ordered they have been prepared to show that there was a real need for the guard. They have also been prepared to show the

employer how to install every guard they have ordered. Nothing has been ordered in the way of safety devices unless it could be shown that the device required was thoroughly practical.

This attitude on the part of the commission and the application of these methods by its field deputies, together with the great amount of personal work done by the commissioners and inspectors in spreading the gospel of safety, paved the way for the hearty cooperation which the employers of Wisconsin have given to the State in its accident-prevention campaign. Whatever success the safety movement in Wisconsin has attained is due to this cooperation more than to anything else.

I. GENERAL INSPECTION SERVICE.

The safety and sanitation department of the Industrial Commission conducts the general factory-inspection service and several specialized activities, such as building code administration, inspection of steam boilers and refrigerating machinery, improvement of industrial lighting and enforcement of the lighting orders, and general fire prevention and inspection service.

The orders which have been adopted by the commission form the basis upon which all inspections are made in places of employment and public buildings in the State. These orders are as follows:

1. General safety orders, applicable to machinery and conditions in all plants. This group also includes a few special orders on paper mills and woodworking plants.
2. General sanitation orders.
3. Laundry safety orders.
4. Elevator safety code.
5. Boiler safety code.
6. Orders on existing buildings.
7. Building code.
8. Building-construction safety orders.
9. Electrical safety code.
10. Lighting orders.
11. Fire-protection orders.
12. Refrigerating-machinery safety orders.
13. General orders on zinc miners.

The general factory-inspection service is conducted by a staff consisting of a chief safety engineer, an assistant, and eight field deputies, each of whom is assigned to a district. The duties of the field deputies are to inspect places of employment for the purpose of enforcing the orders of the commission. In addition to the enforcement of these orders, the deputies are also charged with the duty of enforcing the child-labor laws, enforcing laws regulating the hours of employment for women, investigating serious accidents, and making any special investigations within their districts which may be

necessary to facilitate the work of other departments of the commission.

The attention given to safety by the field deputies has always been primarily educational in character. The commission has never regarded that the work of the deputy was to enter a place for the purpose of finding points of danger and recording them upon a certificate of inspection. On the contrary, the commission has required that its representatives in the field may be men of considerable experience, well equipped for their work, and capable of giving practical suggestions not only in regard to safety of equipment, but more especially in regard to methods of organizing and conducting safety campaigns in individual plants. It has held that the deputies' chief function was to present safety work to the manufacturers and to the workmen in such a way that they will become interested and will appreciate its practical value from the standpoint of efficiency. The deputy has been required, so to speak, to "sell safety" to the employer, the superintendent, the foreman, and all down the line. The inspector who found only half of the danger points in a factory but who stirred up interest in safety among the men in the plant and left the manufacturer with the right attitude toward the problem was considered successful. The deputy who found every exposed set screw and every open gear and made a careful tabulation of every danger point in the place but who left the manufacturer indifferent about safety was considered a failure.

During the years 1915, 1916, and 1917, there were 40,980 accidents settled under compensation in this State. Of this number 7,789, or 19 per cent, were strictly machine accidents, such injuries as we may assume could have been prevented by mechanical safeguards. This, we believe, is just about as low a proportion of machine accidents as any State with an equal amount of manufacturing is able to show. The attention given to safeguarding in past years has borne fruit, and the factories throughout the State have been brought up to a high standard with respect to the safeguarding of physical equipment. Granted that the present improved conditions be maintained, it is not probable that increased attention to safeguarding will cause any notable effect in the reduction of the present accident frequency rate. If by such increased attention we should be able to cut down the machine accident rate 25 per cent, it would result in a decrease of less than 5 per cent of all accidents occurring annually. The deputies therefore, while not neglecting the importance of mechanical safeguards, have found it advantageous to devote considerable time to the work of assisting employers in reviving and developing safety organizations in their plants, and stimulating interest among the foremen and workmen by practical talks on safety whenever inspections are made. Occasionally, special meetings are arranged, at

which talks on unsafe practices are given in connection with slides or moving pictures. Many such meetings have been held with groups of factory employees and with labor unions. Also, the deputies in their contact with manufacturers endeavor to interest them in various phases of industrial betterment work which are now generally recognized as having an important relation to the accident rate; such, for example, are an adequate and up-to-date first-aid room, an employment department, improved sanitation, lunch rooms, factory-training classes, instruction in English, etc. As a means of reaching the foreman and helping the manufacturer interest him, the commission began in June of this year to issue a monthly safety magazine, which is sent to 5,000 foremen, at their residence addresses. Employers are also urged to become affiliated with the National Safety Council, and get the benefits which the splendid service of this organization is able to offer them. The safety educational service of the commission is being gradually extended. Needless to state, such cooperation is greatly appreciated by both employer and employee.

A method which has been found very helpful in interesting the manufacturer to inaugurate an intensive safety campaign in his shop is to make a study of the accident experience of the plant and place this in the hands of the deputy. Employers are required by law to report to the commission all accidents causing disabilities of more than seven days. When a deputy is planning to get things started in a particular factory he is given data taken from these reports showing the number of accidents in the plant within a given period, the department in which they occur, their causes, the character of the injuries, and the cost in compensation and medical expense. He is thus armed with facts which not only give him a clear cut outline of the problems which he will find in the plant, but also enable him to put up a strong argument to the employer on safety as an essential of business efficiency. Presenting an employer with a summary of this kind has frequently had the effect of surprise and sometimes a shock. It never fails to make an impression. In many instances it has been the means of convincing him that it would be well to give closer attention to safety problems. In several instances it has resulted in the employment of a safety engineer on full time.

The Wisconsin compensation act has a unique provision to the effect that when an injury is due to the failure of an employer to comply with any safety order of the commission the compensation of the injured is to be increased 15 per cent. The additional compensation must be paid by the employer and not by his insurance carrier. By the same provision the workman is under obligation to use the safety devices required by the orders, and if his injury

is due to willful refusal to use such safeguards, his compensation is then decreased 15 per cent. It is one of the duties of the assistant to the engineer to read all accident reports with a view toward selecting for investigation such accidents as appear to have been due to violation of the safety orders, following up the investigation and reporting to the compensation department whether the employer or the employee, as the case may be, should be held for the penalty. The enforcement of this provision has helped greatly to create a demand for copies of the State safety orders, and to bring forcibly to the attention of the employer and employee the necessity of complying with the orders.

The safety department has been endeavoring to work in close cooperation with the insurance companies and the Wisconsin Inspection and Rating Bureau, so that there will be as little confusion as possible in the matter of standards to be followed by the employer. The deputies are familiar with the standards followed by these organizations and recommend to employers who are about to install safeguards that they design guards which will conform to the standard of the rating bureau, in order that they may get the benefit of all possible rate reductions. An important step which has been taken recently by the safety department of the commission is directed toward uniformity of safety standards to be applied by the State inspectors, compensation insurance companies, and the rating bureau. Committees are now at work preparing uniform standards, which will no doubt be readily accepted and put into effect, with the result that confusion as to the requirements of these various agencies will be cleared away.

During the past year the first industrial service conference given under the auspices of the Wisconsin Industrial Commission and the Milwaukee Association of Commerce was held in the city of Milwaukee. The purpose of this conference was to bring home to the manufacturers, industrial service workers, and others present the most recent information and up-to-date thought on the subjects of safety, sanitation, employment, hours of labor in their relation to production, health conservation in industrial occupations, and other important topics bearing on the general problems of securing efficiency in production and improving the relationship between capital and labor. The good results obtained from this conference are being followed up by deputies of the safety and sanitation department, who are assisting employers to establish the essential elements of industrial service work in plants wherever such aid is requested.

II. SPECIALIZED ACTIVITIES.

Building code administration.—A State building code containing the broad general requirements of fire protection, sanitation, and

structural safety was made effective in Wisconsin in October, 1914. The code affects all new construction and additions or alterations of structures erected prior to that date, and applies to all buildings, except private residences, flat buildings for not more than two families, buildings for agricultural purposes located outside of the corporate limits of a city or town, and purely temporary buildings, such as sheds used in construction work.

The code is administered by two State building inspectors in cooperation with local officials, chiefly city building inspectors, and the chiefs of local fire departments. The State inspector's work consists of examination and approval of plans submitted in advance of building, field inspection during construction, and final inspection when a building is completed. The revised code, which is now being printed, requires that plans and specifications of the following buildings shall be submitted to the commission for approval before contracts are let, or work is commenced:

Theaters and assembly halls; schools, colleges, and academies; apartment houses, hotels, and places of detention; factories, offices, and mercantile buildings, as follows:

(a) All buildings having floor or roof spans greater than 30 feet;

(b) All buildings which are more than two stories high;

(c) All buildings which are two stories high and are more than 5,000 square feet in area at the second floor level.

This branch of the safety department also inspects and enforces the orders on existing buildings and the orders relating to the safety of workmen engaged on construction work. The building department from time to time has rendered service to a number of municipalities in this State in drafting local building regulations and ordinances relating to fire protection and fire prevention. Through the examination of plans the inspectors have frequently been able to offer suggestions for improvement, often for lower cost than originally contemplated. Public addresses, newspaper articles, bulletins, and educational leaflets have been utilized by the members of this department in giving publicity to the principles of "good building" and safety.

Boiler inspection.—Nearly all of the steam-boiler inspections in the State are made by inspectors in the employ of insurance companies and municipalities. Only about 2 per cent of the boiler inspections are made directly by the State boiler inspector. The aims in this work have been to eliminate duplicate inspections and to provide for thorough and efficient inspection service by the insurance companies and cities employing boiler inspectors. To accomplish these objects the industrial commission, through its boiler committee, has adopted as part of its boiler code provisions regulating the inspection service conducted by private and municipal inspectors.

The chief duties of the State boiler inspector are to prescribe examinations and to issue certificates of competency to inspectors in the employ of insurance companies and cities of the first, second, and third classes; to receive, examine, and file reports of their inspections; and to inspect all steam boilers which are not insured, which are not subject to municipal inspection, and which are not otherwise exempt from State regulation.

In May of this year a set of rules governing the installation and operation of refrigerating machinery, which had been prepared by a special committee and discussed at a public hearing, were adopted by the commission. The enforcement of these orders has been made a part of the duties of the State boiler inspector.

Industrial lighting.—The Industrial Commission of Wisconsin was perhaps the first State labor department to add an illuminating engineer to its staff of deputies. The commission has long recognized the importance of good lighting as an aid in reducing accidents and conserving eyesight, but it was not until the latter part of 1916 that it became possible to put an expert into the field to assist the manufacturers in improving the lighting conditions in their shops and factories. The results already accomplished have been beneficial, not only to a large number of workingmen, but employers also have gained thereby, because good lighting always makes for efficiency and increased production as well as safety.

The principal duties of the illuminating engineer are as follows:

1. Supervise lighting inspection in factories and all places of employment.
2. Furnish plant managers information regarding the best methods of obtaining good industrial lighting.
3. Prepare bulletins to assist plant managers, engineers, architects, electricians, and others in conforming with the State lighting orders.
4. Make lighting surveys and studies, to determine proper methods of lighting to be recommended by the industrial commission for different industrial processes.
5. Supervise inspection of electrical equipment for the purpose of enforcing the State electrical safety code.
6. Investigate accidents caused by electricity.

Fire prevention work.—This branch of the safety department is in charge of a superintendent of fire prevention. Its functions may be classified under the headings of fire prevention, fire protection, building improvement, and education, as follows:

A. Fire prevention:
   1. Supervise inspection work of all local fire departments, and receive and examine their records and quarterly reports.
   2. Receive complaints of dangerous conditions, and make inspections to enforce the State fire prevention orders.
   3. Make original inspection of conditions in 41 cities whose fire departments are not continuing an adequate inspection service.

A. Fire prevention—Concluded.
   4. Issue orders to correct fire hazards.
   5. To give special attention to the fire hazards existing in flour mills, grain elevators, wholesale houses, warehouses, and food repositories, and to take necessary action to improve conditions wherever this is found necessary. During the past year 1,730 reports of such hazards have been received and followed up, in cooperation with the State council of defense.

B. Fire protection:
   1. Assist local communities in organizing and reorganizing fire departments.
   2. Investigate the adequacy of local water and chemical protection, equipment, personnel, practice drills, proper housing, and care of equipment, etc.

C. Building improvement:
   1. Offer assistance in securing better and safer construction.
   2. Give advice regarding structural changes in order to make building safer.
   3. Regulate and isolate fire hazards in and around buildings.
   4. Assist municipalities in framing local building codes and fire prevention ordinances.

D. Education:
   1. Issue monthly bulletins for the press, fire chiefs, trades, schools, clubs, civic bodies, etc.
   2. Publish fire prevention day pamphlet.
   3. Give public addresses at schools, clubs, commercial organizations, etc.
   4. Issue fire prevention cards and posters.

CALIFORNIA'S ACCIDENT PREVENTION CAMPAIGN.

BY JOHN R. BROWNELL, SUPERINTENDENT OF SAFETY, CALIFORNIA INDUSTRIAL ACCIDENT COMMISSION.

The safety department of the Industrial Accident Commission of the State of California was organized early in the year 1914, with a nucleus of safety engineers, each of whom was a specialist in some particular branch of engineering, and included mechanical, civil (construction), and electrical engineers. The department has later been augmented by a force of inspectors and is now as follows:

Superintendent of safety.
Two mechanical engineers.
Two construction engineers (civil).
One electrical engineer.
Two electrical inspectors.
One chief boiler inspector.
Three boiler inspectors.
One chief elevator inspector.
Four elevator inspectors.
Chief mine inspector.
Three deputy mine inspectors.
One first-aid instructor.

It should be stated that by arrangement with the Federal Bureau of Mines, the chief mine inspector is also employed by the Bureau of Mines, his salary and traveling expenses being paid jointly by the Government and the Industrial Accident Commission.

The year 1914 was spent largely in "getting acquainted" with the employers and as far as possible with employees. Each safety engineer was especially charged to try to interest employers in the safety committee plan of accident prevention. Emphasis has therefore been laid upon the educational side of the work.

The result has been gratifying, in that there are an increasing number of employers who have developed their safety organizations on a firm basis, with corresponding reductions in their accident frequencies.

It is necessary that mechanical hazards be eliminated where possible, and hence the commission, exercising its power, has issued safety orders and rules which now cover the following list of subjects: General; Mines; Woodworking; Laundries; Engines; Elevators; Boilers; Air-pressure tanks; Trench construction; Window cleaning; Electrical utilization; Logging and sawmills; General construction.

These will soon be augmented by safety orders covering steam shovels and locomotive cranes, safety rules for quarries, and safety orders for electrical stations.

In the preparation of all safety rules and orders the plan was adopted of having an advisory committee meet with the commission's representatives and formulate a tentative draft, which was then printed and given wide distribution to those who would be affected, after which one or more public hearings were held, where opportunity was given for full discussion.

Upon request, any of the tentative orders or rules were referred back to the advisory committees, who passed finally upon such points and submitted their recommendations to the commission. In practically all cases the committee recommendations were adopted by the commission and put into effect on specified dates.

In the case of several of the safety orders and rules a fairly exhaustive investigation in the field was first made by one or more of the safety-department staff, and a preliminary draft drawn up as a basis for discussion by the advisory committee. This proved of exceptional value in the preparation of the logging and sawmill safety orders.

Mass meetings have been held by the commission in all the principal cities of California, where illustrated talks were given on accident prevention. Numerous talks have also been given to groups of employees, where special stress has been laid upon the individual's responsibility as regards his own safety as well as in connection with his part in preventing accidental injury to his fellow workmen.

From time to time various bulletins have been published dealing with special hazards. Such a series comprised bulletins on the hazards of building construction. Cuts of photographs were printed in these bulletins in order to indicate clearly just what conditions needed correcting. Other bulletins have dealt with boiler-room precautions and with standard signals for woods donkey boilers.

In 1916 a "Safety Bear Club" was organized among the miners of the State, and, in addition to wearing an appropriate celluloid button or badge indicating membership, each miner joining the club has received carefully prepared letters sent to him individually in a separate envelope. There are now over 8,000 members in the club, and nine letters have been sent out to each member.

One of the principal industries of California is the manufacture of lumber. The giant redwood is found nowhere else, and the hazards connected with the logging operations, as well as the handling of the huge logs at the sawmills, have been of a special nature. California also cuts millions of feet of white and sugar pine. A study of the principal causes of accidents in the lumber industry showed that there was a large class which could be overcome only through the personal caution of the employee.

As a result of the cooperation of the California Redwood Association and the California White and Sugar Pine Manufacturers' Association, which cooperation extended financial aid, a set of eight reels of motion-picture films were taken and successfully produced showing a series of experiences which were typical of the hazards to be overcome.

Mr. James C. Bennett, one of the safety engineers of the safety department of the commission, prepared the scenario, and the actors were all workmen at their actual tasks, or posed to show the results of observing the necessary precautions. The showing of the pictures has been handled much the same as a circulating library, each of the eight separate reels dealing with practically a complete phase in itself. The films were prepared during the latter part of 1917, and have been widely shown at various logging camps and sawmills of the State.

In January, 1917, the safety department issued its first number of "California Safety News," which has appeared as a monthly periodical of 16 pages. With a few exceptions the articles have been written by members of the department. Illustrations have been freely inserted and various phases of accident prevention have been treated.

Through its corps of safety engineers and inspectors the mechanical hazards are being eliminated as rapidly as possible. The safety orders and rules have become the recognized standards in all new construction and in existing installations wherever practicable.

The basic principle of the workmen's compensation, insurance, and safety act under which the Industrial Accident Commission operates stipulates that all safety requirements shall be reasonable, and hence a broad and flexible interpretation is given.

The "Star and club" method of handling inspections has been taboo from the inception of the safety department and a spirit, rather, of cooperation and service has been developed which has won the unqualified support of all concerned.

In the spring of 1914 a safety museum was started by the commission. It has grown to such proportions that approximately 3,000 square feet of floor space is occupied with several hundred separate exhibits of safety devices. These are augmented by collections of photographs showing safeguarded conditions in California's industrial plants. There are also several exhibits of photographs from other States. The museum is advantageously located on the ground floor of the Underwood Building at 529 Market Street, San Francisco, and has often had a daily attendance of over 700 visitors. A capable caretaker is in charge at all times to explain the operation of any device or to indicate by photograph how various hazards have been overcome.

Several hundred lantern slides have been prepared and are on file in the safety department for use in lectures by various members of the staff, besides being available to safety engineers and others who desire to show them at industrial-plant committee meetings and safety rallies.

With the vastly augmented shipbuilding program, the shipyards of California began to enlarge existing equipment, and a number of new companies came into the field. This has meant a corresponding increase in an employment which presents probably the two most prolific sources of accidents, namely, (1) falling, flying, and rolling materials, and (2) personal falls.

In April, 1918, the superintendent of safety of the commission called a meeting of safety engineers and inspectors of the various shipbuilding concerns of the San Francisco Bay region. The meeting proved successful in bringing together in a round-table discussion those who were in closest touch with the work. Mr. C. E. Ralston, Government safety engineer at Mare Island Navy Yard, attended, and by his enthusiasm and practical ideas gave valuable impetus to the spirit of the meeting. Subsequent meetings have been held at approximately monthly periods.

The shipyards at San Pedro, Long Beach, San Diego, and Eureka are so widely separated geographically as to make it impracticable for them to participate in the discussions, but through inspections by our safety engineers they are kept posted on the best practices.

A letter has been sent to the Emergency Fleet Corporation, asking for their cooperation with the commission in taking motion pictures of shipyard hazards. The matter has been referred to Washington for decision, and we are hopeful of receiving a favorable answer to the proposition.

The employment of labor in new fields, and especially the increasing tendency for women to discharge the duties commonly performed by men, has been a cause of more or less apprehension as to any substantial reduction in the accident frequency, but it is none the less to be conceded that where earnest accident-prevention propaganda is carried on there will result correspondingly fewer accidental injuries in our industries, and California is determined to do her part in conserving the man power of the Nation.

WHAT THE NEW YORK STATE INDUSTRIAL COMMISSION IS DOING TO PREVENT ACCIDENTS.

BY JAMES L. GERNON, FIRST DEPUTY COMMISSIONER, NEW YORK STATE INDUSTRIAL COMMISSION.

The Bureau of Factory Inspection of the New York Department of Labor has, since July 1, 1915 (at which date the present industrial commission was created), conducted a most vigorous campaign to prevent industrial injuries and has accomplished very satisfactory results in securing compliance with the large number of orders issued relating to sanitation, accident prevention, and fire protection.

New York State has within its borders 65,449 factories, employing 1,500,000 people. The industries are diversified—including practically every industry found in other States of the Union, many of them in greater number than in any other State and some in such large numbers that they present difficult problems peculiar to the industry.

Many of the larger industrial plants employ safety engineers, who carry on very creditable safety campaigns and some excellent welfare work. Nevertheless, there are many large establishments that do not employ safety men nor have they properly organized safety work in their plants. Many who endeavor to carry on safety campaigns fail in their effort, due to an inferior type of safety director. In some instances where the director is competent, failure is due to the management of the establishment in not permitting the director to spend sufficient money to install safeguards properly and organize safe practices in a practical and efficient manner. Thus, it very frequently happens that improper and impractical guarding has to be discarded and orders issued by the inspection bureau to provide adequate protection to the employees of the establishment.

While many plants in our State are doing very creditable work in their endeavors to prevent industrial injuries, it should be borne in mind that many thousands of factories do nothing to organize effective safety work—some because of lack of knowledge or indifference, others because of their reluctance to spend money for the installation of devices to protect the workers from injury. In many establishments this policy is pursued, regardless of the fact, which is now generally conceded, that the installation of safeguards, the adoption of safe practices for the industry, and the instruction of the employees regarding these practices are known to be a paying

investment, even in the smallest plant. There are many small manufacturers to whom the cost of safety devices is a serious problem, because of the financial condition of the business, and far too many of them believe that in paying a premium for compensation they have protected themselves from financial loss, the cost of injuries being shifted to the insurance carriers. They have no regard concerning the injury or physical suffering which their employees may experience.

In consideration of all these difficulties, the New York State Inspection Bureau has grappled with this important problem and has been fairly successful in mastering the same. It should be borne in mind that those responsible for the conduct of the large majority of the manufacturing establishments know far too little of the practical methods of installing safeguards or conducting safe practices in industry. They can not afford to hire a safety engineer and do not seem competent to meet the problem in a practical way; therefore, the State inspector must act as safety man in this large class of establishments. In this type of establishment, and in those where they readily install proper safeguards, the inspector must instruct both the employer and the workman in a practical, up-to-date method of safeguarding and in the inauguration of a proper plan of conducting a campaign of safe practices.

In the enforcement of orders relative to safeguarding employees from injury there are those who claim that all that is necessary to induce manufacturers to install safeguards is proper cooperation between the manufacturer and the State inspection bureau charged with the enforcement of the provisions of the law. Such cooperation is ideal; it is essential, but not always possible to secure. Experience shows that without a policy of insistence on compliance with the orders issued, and without the power to prosecute violators of the law or authority to tag machinery unsafe, not much would be accomplished. A very large percentage of the manufacturers in New York State are cooperating with the inspection bureau. These manufacturers deserve great credit for the results accomplished by them in making their plants as safe as possible. Their efforts will compare very favorably with employers of other States in their desire to make their establishments as safe as possible, in order to protect the employees from industrial injury.

A conservative estimate of the cost for installing safeguards in compliance with the orders issued in New York State for the past three years will total an aggregate of $5,000,000.

You will understand that the number of orders relative to accident prevention does not include the number of machines to be safeguarded. Our order may mean the guarding of one machine, or it may mean, as frequently happens, the guarding of hundreds of ma-

chines of the same type. Nevertheless, far too many of the establishments must be forced to do what is reasonable and fair for the protection of their employees will be shown in the tables of prosecutions, tagging, etc., accompanying this report.

In order to measure properly the results accomplished in New York State, there is presented here the figures relative to orders issued and compliances secured for the past five years:

ORDERS AND COMPLIANCES REPORTED BY THE DIVISION OF FACTORY INSPECTION IN THE STATE OF NEW YORK FROM OCTOBER 1, 1913, TO JUNE 30, 1918.

Fiscal year ending—	Orders and compliances relating to health and safety.								Whole number of orders and compliances.	
	Sanitation.		Accident prevention.		Fire protection.		Total.			
	Orders.	Compliances.	Orders.	Compliances.	Orders.	Compliances.	Orders.	Compliances.	Orders.	Compliances.
Sept. 30, 1914	74,359	44,094	70,768	40,286	100,305	58,947	245,432	143,327	287,893	179,826
Sept. 30, 1915	41,418	34,247	50,742	38,129	33,710	27,378	125,870	99,754	163,968	135,697
June 30, 1916 [1]	32,088	31,944	36,483	41,634	18,433	22,699	86,954	96,277	116,309	125,889
June 30, 1917	53,555	65,201	46,288	60,486	9,684	17,481	109,527	141,168	173,982	206,625
June 30, 1918	48,735	54,849	39,730	47,475	6,022	8,397	94,487	110,721	135,793	152,361
Total	250,105	228,335	244,011	228,010	168,154	134,902	662,270	[2]591,247	877,945	[3]800,398

[1] For 9 months.

[2] Exclusive of 16,132, 8,422, and 31,425 orders relating respectively to sanitation, accident prevention, and fire protection, in which cases jurisdiction was transferred by law to New York City departments, or the illegal conditions ceased to exist by reason of modifications in the Labor Law and Industrial Code, removals, fires, or accompanying circumstances such as to make the original orders no longer necessary to be enforced by the Department of Labor. These figures bring the aggregate number of orders disposed of in regard to sanitation, accident prevention, and fire protection up to, respectively, 244,567, 236,432, and 166,327, thus leaving 5,638, 7,579, and 1,827 orders outstanding on July 1, 1918, respectively, in relation to sanitation, accident prevention, and fire protection, making a total of 15,044 orders outstanding on July 1, 1918, for these three groups.

[3] Exclusive of 62,108 orders in which jurisdiction was transferred by law to New York City departments, or the illegal conditions ceased by reason of modifications in the Labor Law and Industrial Code, removals, fires, or accompanying circumstances such as to make the original orders no longer necessary to be enforced by the Department of Labor. These figures bring the aggregate number of orders disposed of up to 862,506, leaving a total of 15,439 orders outstanding on July 1, 1918. Included in these 15,439 uncomplied with orders are 4,440 orders that were issued in the month of June, 1918; and the impossibility of securing compliance with the major portion of these latter orders before July 1 is readily apparent.

There were 877,945 orders issued and 800,389 compliances secured. Of the remaining 77,547 orders, 62,108 constituted fire protection orders in New York City, which were transferred to the New York City fire department by reason of modification of the Labor Law placing the responsibility for compliance with these orders on the fire department of that city. This leaves 15,439 orders uncomplied with. In this number are included 4,440 orders issued in the month of June, 1918.

The table also shows the number of orders issued and compliances secured relative to health and safety, which include orders for sanitation, accident prevention, and fire protection. A total of 662,270 orders were issued; 591,247 compliances were secured. It is evident from these figures that there remain 15,044 orders of this class uncomplied with. In this number are included 3,514 orders issued in the month of June, 1918, compliance with which can not be expected before July 1, 1918. There being but 15,439 orders of all kinds out-

standing shows that our compliances are nearly up to date, or as near so as can be expected when the character of the orders and the time it will take to do the work are taken into consideration.

Under the provisions of section 81 of the Labor Law, we are empowered to tag as unsafe all machines which are dangerous and unguarded. With this provision of law we have the most effective means of securing compliance with the orders issued. If the orders are not complied with at the time set forth in the notice of orders, a letter known as a "Machinery tagging letter" is forwarded, fixing a definite date for compliance.

We are in receipt of a report from our inspector that you have failed to comply with the orders of the department, to wit:

1. *Properly guard belts and pulleys of job presses.*

This shows that you are maintaining a hazardous condition in violation of section 81 of the Labor Law:

When in the opinion of the commissioner of labor a machine or any part thereof is in a dangerous condition or is not properly guarded or is dangerously placed, the use thereof shall be prohibited by the commissioner of labor (State Industrial Commission), and a notice to that effect shall be attached thereto. Such notice shall not be removed except by an authorized representative of the Department of Labor, nor until the machinery is made safe and the required safeguards or safety appliances or devices are provided, and in the meantime such unsafe or dangerous machinery shall not be used.

Unless the above orders are satisfactorily complied with by *August 20, 1918*, the department will cause the machinery to be tagged in accordance with the provisions of the Labor Law, thereby prohibiting the use of such machinery until the orders are fully complied with and the hazard removed.

Yours, truly,

———— ————,
Supervising Inspector.

Should the order not be complied with at the time indicated in the "Machinery tagging letter," the unsafe tag is applied to the machine and its use prevented.

UNSAFE.

By virtue of the power conferred upon the Commissioner of Labor in section 81 of the labor law, the use of this *power press* is hereby prohibited until made safe.

This notice must not be removed except by representative of this department.

To Inspectors:

This tag must be applied in all cases where a machine or any part thereof—
(1) Is in a dangerous condition.
(2) Is dangerously placed.
(3) Is improperly guarded.
(4) Guard is removed.
(5) Terms of our notice not complied with within the time specified therein.
Return this tag with report to supervising inspector.
Removed by inspector on ————, 191–.
Name and address of concern ————.
Remarks ————.

This has proved the most effective method of securing compliance with the orders to safeguard machinery. We issue many of these letters and are compelled to apply the "unsafe" tag in very few instances, when compared with the number of letters issued. In only 933 cases were the tags used in the fiscal year ended June 30, 1918, which is small in number when compared with the 47,475 compliances for accident-prevention orders secured in the same period.

Following is a list of machines to which tags were attached:

Shafting and couplings, buffing, polishing and grinding wheels, drill presses, saws of all kinds, planer, jointers, and molding machines, corner staying machines, extractors, laundry machines, winder, calenders, and rolling machines, belts and pulleys, printing presses, punch presses, stamping and rivetting machines, gears, lathes, milling machines, mixers and kneaders, ruling machines, lapping machines, reamer, and slotters.

The effectiveness of this system is proved by the small number of prosecutions begun relative to accident prevention orders in comparison to the number of prosecutions for other classes of orders issued.

The following statement shows the number of prosecutions begun during the year ending June 30, 1918:

Administration	7
Sanitation	562
Accident prevention	52
Fire protection	230
Children	433
Women and male minors	191
Day of rest	257
Miscellaneous	137
Total	1,869

The 52 prosecutions for accident prevention, as shown in this table, were in instances where the application of the "unsafe" tag would not prevent the use of a machine. Their character is indicated in the following table:

Prosecutions instituted in current year relative to accident prevention.

1. Elevators and hoistways	13
2. Machinery (including vats, pans, etc.)	13
3. Stairs, platforms, pits, floors, etc. (including repairs)	13
4. Lighting to prevent accidents	13

The New York Department of Labor realizes that the hazard in industry is very great. In the fiscal year ended June 30, 1918, there were 300,000 industrial accidents reported to the commission, resulting in 55,000 claims for compensation. The injuries cost approximately $35,000,000 to $40,000,000, and the compensation awarded will total approximately $14,500,000. This is an enormous economic loss, regardless of the suffering these injuries entail. They should

be reduced to a minimum. When we measure the claims for compensation with the number of factories in the State, we find that there are less than one for each factory. It should not be forgotten that the injuries reported and those for which claims for compensation are made are not all sustained in factories. At least half the injuries occur in those industrial groups over which the inspection bureau has no power to regulate or improve the hazardous condition.

The inspection bureau has been very successful in its policy of requiring every inspector to report all installations of new machinery installed since previous inspection, where the machine itself is dangerous and the manufacturer of the machine has failed to guard same properly. In each instance a communication, giving in detail the defects, is sent to the manufacturer of the machine asking that they be corrected. It is very gratifying to say that in every instance the makers of the machines have signified their intention to remedy the defects and have heartily cooperated with the bureau of inspection in an effort to make their machines safe for the operator.

We have completed special surveys of the dyeing and cleaning, textile, and chemical industries, the report of the last two not being published to date. We are conducting special surveys relative to ventilation, which is a very essential but difficult problem in many industries, especially those using poisonous or injurious gases, fumes, or substances. When these surveys, investigations, and lists are completed, the industrial commission can establish standards on a scientific and practical basis, and thus forge a few more links in the already strong chain of safe practices being enforced for the protection of the industrial workers.

Never in the country's history has so much depended on our industries, and most important are the workers in such industries. The present world conflict will be decided in favor of the nations having the greatest man power. Never has a worker been valued so highly. So in this campaign for safe practices in industry we only do our share when we furnish our full measure of protection to the workers in industry, so that they may contribute all their efficiency and skill to the country's cause.

THE VITAL IMPORTANCE OF INDUSTRIAL-ACCIDENT PREVENTION IN WAR TIME.

BY VICTOR C. NOONAN, DIRECTOR OF SAFETY, OHIO INDUSTRIAL COMMISSION.

All the industrial commissions and compensation boards of the United States and Canada should at this meeting consider and devise some plan to bring home to the employers and workingmen of the United States and Canada the very vital importance in these war days of conserving man power—in other words, of more thoroughly protecting human life and limb and reducing industrial accidents to a minimum. It is now as clear as daylight to all who have given any thought to accident prevention that at least 25 to 75 per cent of the accidents occurring in workshops and factories can be eliminated. The splendid accident reduction experience of the United States Steel Corporation and of thousands of individual plants throughout the country has proved beyond the shadow of a doubt the great possibility of preventing both fatal and nonfatal accidents.

During the past year the department of safety of the Industrial Commission of Ohio has conducted a survey in about 500 of the larger industries of the State with a view to finding out definitely what results were being obtained by organized businesslike safety work. The survey shows that where accident prevention was a businesslike department, thoroughly organized, with workmen's safety committees, and where the number, causes, frequency, and cost of accidents were carefully kept and accidents investigated, there was a reduction of anywhere from 25 to 75 per cent in the number of accidents reported since these companies had commenced accident-prevention work.

In spite of the good work that has been accomplished along safety lines, much more can be done. I am glad to say that the war has given the safety movement throughout the country a much-needed stimulus. It has become apparent that for every soldier we send to the trenches we must protect and safeguard at least 10 workers in the factories. When one of these workers is killed or disabled by industrial accidents the loss of that worker to the country, to my way of thinking, is ten times greater than if one of the boys in the trenches had been killed or disabled. Accident prevention, therefore, should be a very important war activity; in fact, it should be one of our most important war activities. Employers and workmen alike

must consider it their highest patriotic duty to do everything possible to prevent accidents. Every fatal accident, every eye lost, every hand or foot crushed or amputated—in a word, every accident that occurs to a worker—is just as much of a victory for Germany as if those workers had been disabled by German guns. On the other hand, every accident prevented is a glorious victory for the Stars and Stripes. It is a victory also for better living, better citizenship, and happier homes.

Industrial-accident prevention, therefore, gives us a great opportunity to make the industrial life of our country a safer place to work in. Industrial-accident prevention will not only teach men and women to be more careful, but it will teach all the workers, as well as employers, how to think. It will teach the workers to be more industrious, more thrifty, more sober, and more upright. Industrial-accident prevention will also give all of our people a higher appreciation of the value of human life and limb, and surely in these days, when life and limb are held so cheaply, that higher appreciation is sadly needed.

No organization or organizations can do more to promote industrial-accident prevention than the industrial accident boards and commissions of the United States and Canada working as a body, and also each State working individually.

In Ohio during the past four years considerable educational accident-prevention work has been accomplished: First, through meetings of employers, superintendents, and foremen; second, through meetings of employees; third, by safety exhibits; fourth, by safety motion pictures illustrating the cause and prevention of accidents reported to the commission; fifth, by safety bulletins and other literature; and, sixth, by a study of the accident experience of individual plants or groups of industries.

WHAT PENNSYLVANIA IS DOING TO PREVENT ACCIDENTS.

BY ROBERT D. YOUNG, PENNSYLVANIA SAFETY MAN.

It has been well said, "Cooperation is to-day an accepted element in any program of industrial or social improvement," and the one great question at present confronting those agencies having as their purpose the conservation of life and limb in industry is the extension of this cooperative element, and we feel that the Pennsylvania Department of Labor and Industry has in the past few years put forth splendid efforts along these lines, and, although accidents have continued to occur with alarming frequency, especially in 1916, 1917, and 1918, due in part to the abnormal war conditions prevailing, we are going on, confident that the pendulum will soon swing forward and that this preliminary or ground work will be reflected in the coming years in a material reduction of the injuries and deaths caused by preventable accidents.

To date, for 1918, both fatal and serious accidents in the industries of Pennsylvania show a decrease over the same period for 1917, this notwithstanding the increase in the number of men employed this year over last year. There is still, however, much to be done to bring accidents down to a minimum, and to this end the Department of Labor and Industry is endeavoring to secure a more continuous cooperation of the employer and employee.

The laws as enacted in Pennsylvania make mandatory the providing of safeguards for machinery and for the protection of all hazards, yet it is necessary, through educational endeavor, to impress the employees that such safeguards shall be used, and that every device or instrument which may be approved as desirable or effective in the prevention of industrial accidents shall be likewise constantly and conscientiously used.

As we are all aware, regardless of how well machinery may be safeguarded or how processes may be changed to eliminate the danger of injury, there still remains, as the most important and the most difficult factor in the whole situation, the personal equation, mostly the employees themselves, and our energy and attention as a department has been directed to them—however, with the cooperation and help of the employer.

As a solution to this aspect of the problem we have been applying our best thought to the development of a system of industrial-accident-prevention education, realizing that if prompt or immediate returns are to be had the industrial worker must be educated and trained in safe practices—to understand thoroughly the hazard of his job and to perceive and avoid danger, not only to himself but also to his fellow employee.

We shall indeed be remiss if we do not lay plans for the education of the industrial worker of to-morrow, and it is to be hoped that before long a comprehensive system of personal safety education will, through the cooperation of the school authorities and the Department of Labor and Industry, be devised which will be productive of the best possible results in that direction.

In our educational work the first point of attack is the employers and the plant managements. Through personal interviews we endeavor to point out to them, both from the humane and the financial side of the proposition, the importance of conserving their man power. We are pleased to observe that, when attention is called to the daily appalling waste through industrial accidents, to the physical suffering of the injured, and to the privations which follow an injury to the wage earner, the sympathy of the employers and their generous impulses have been stirred, resulting in their taking up the work in an earnest, sincere manner. We are also pleased to state that the majority of those establishments which have had the matter called to their attention have organized for safety, which augurs well for the success of accident prevention in Pennsylvania.

After we have interested the plant managements in the safety work we assist them, if they desire, in the formation of their accident-prevention campaign, and furnish gratis a series of motion-picture exhibits and hold safety rallies, which help to keep the employees interested in the work. Already the department's motion-picture films have been exhibited to thousands of our industrial workers and their families throughout the State, and those pictures have, no doubt, been productive of much good.

In addition to the safety films the department sends, without charge, safety posters and bulletins.

The success or failure of an accident-prevention campaign in a plant depends in a large measure upon the attitude of the foremen toward the movement, and consequently we consider it necessary to impress them with their great responsibility in the protection of the workers under their supervision. To accomplish this purpose, special meetings for superintendents and foremen are held in the various localities, at which forceful speakers drive home the safety lesson.

Within recent weeks more than 40 such meetings were held by the Western Pennsylvania Division of the National Safety Council, in cooperation with the Department of Labor and Industry, in Allegheny and adjacent counties, attended by at least 4,000 superintendents and foremen.

Meetings are frequently held during the lunch hour for the workmen and are addressed by our inspectors. All this tends to keep the matter of self-preservation constantly on the worker's mind.

In addition to our factory inspectors, we have special accident investigators who devote all their time to the investigation of fatal and serious accidents. These operate under the direction of the bureau of safety.

Assuming that all accidents are preventable, a case is not considered closed or filed until there has been received by the department positive evidence that something definite has been done to prevent the recurrence of a similar accident, either from the employer or from the accident investigator. Immediately upon the receipt of a fatal-accident report, which by law must be forwarded to the department within 24 hours after the accident occurs, the report is forwarded to the investigator in whose district the accident happened. The investigator proceeds to the scene of the accident with the least possible delay, thus enabling him to ascertain the cause of the accident before the conditions are changed, and to issue instructions or recommendations for the prevention of another similar accident. Upon the receipt of the investigator's report of his investigation by the bureau of safety, the matter is taken up direct by the bureau with the company, and the importance of prompt compliance with the investigator's recommendations is pointed out to them. If the company has a safety organization, a general outline of how it is conducted, with a report of the number of accidents for the previous two years, with the average number of employees, is requested. If the company has no safety organization, it is urged to take up accident prevention work through this system, which our experience has proved to be efficient. Through this method we are enabled to ascertain just what the companies are doing to prevent accidents.

To still further the cause of safety, the department is cooperating with the organized labor bodies of Pennsylvania in putting into effect the resolution presented and adopted by the American Federation of Labor in convention at Buffalo, N. Y., Saturday, November 17, 1917.

Already a State labor safety committee has been appointed, and safety committees are being appointed in all the local unions of the

State, and, as we see it, through this means safety is but the entering wedge whereby a better understanding can be developed between the employer and the employee. With it must come a frank discussion of one vital problem, the solution of which works for their mutual benefit.

Having found that the cooperative plan really works for the good of all in this one instance, does it not stand to reason that the circle of application will grow, become larger and larger, until through faith in each other the contending forces will be led out of the wilderness of strife and misunderstanding into the promised land of industrial peace—made a fact through a square deal for all?

WHAT MASSACHUSETTS IS DOING TO PREVENT ACCIDENTS.

BY WILLIAM W. KENNARD, CHAIRMAN, MASSACHUSETTS INDUSTRIAL ACCIDENT BOARD.

At the present time the work of accident prevention per se in Massachusetts is delegated, by an act of the legislature passed in 1916, Acts of 1916, chapter 308, to a State commission known as the Board of Labor and Industries.

When the Massachusetts Industrial Accident Board was created this work was placed with our board, and our earlier reports indicate the scope and character of the work done. It was found, however, that there was a duplication of work at many points with the work of the commission on labor and industries, and particularly was the complaint made from the shop and factory owners that the constant and repeated visits and investigations of inspectors from various boards and commissions and the varying orders received were confusing and disorganizing and that the situations created had become highly burdensome. It should be understood that it was not these two boards alone, but various other governmental agencies, National, State, and local, which were contributors to the conditions complained of. It was commonly stated by manufacturers, and with some basis of justification, that hardly a day went by that they were not inspected and directed by an agent from some board or other.

To help out this situation and to relieve the manufacturers so far as accident prevention work was concerned, in 1913, by chapter 813 of the acts of the legislature of that year, it was provided that the Industrial Accident Board and the Board of Labor and Industries should work in conjunction and cooperation in accident prevention work. This was found to be so unsatisfactory that in 1916 the present law, giving sole jurisdiction to the Board of Labor and Industries, was enacted; since which time the work of our board has been confined to the broad consideration of the problems involved in accident prevention, rather than the actual detail.

Our statistical department still furnishes an excellent compilation of causes of accidents gleaned from our reports, which makes a valuable basis for investigation. The Board of Labor and Industries has in our department one of its employees to whom is available our reports of injuries, which are made the basis of actual field investigation by the Board of Labor and Industries.

You may wonder that this work was permitted to be taken from the control of the board which would appear to be its proper administration. Our Board of Labor and Industries is, however, charged with functions which make this work closely allied to its other functions, viz, preservation of health conditions, observance of hours of labor, etc.

Moreover, the administration of the compensation law in Massachusetts has been so established that our board finds itself with its time fully occupied. Every case in which any dispute arises which cannot be amicably settled between the parties comes ultimately before a member of our commission personally, first at a conference, and, if not adjusted there, later at a formal hearing, always with an attorney on one side, and ordinarily on both, and later, in case of appeal, before the full board, which sits one day each week to hear such cases.

When I call to your attention that last month there was reported to our board 18,000 injuries to employees, you will perhaps better appreciate why, speaking for my board, I do not report greater activities in our department along the lines of accident prevention.

ACCIDENT PREVENTION IN INDUSTRIES IN ONTARIO.

BY GEORGE A. KINGSTON, COMMISSIONER, WORKMEN'S COMPENSATION BOARD OF ONTARIO.

The Workmen's Compensation Act of Ontario differs from most other acts in respect to the provision made for the prevention of accidents, and offers at the same time an inducement to the employers to cooperate.

Under the Ontario act the employers in any particular class covered by the act may form an association for the purpose of establishing rules and regulations for safety or accident prevention among their employees. Such association must, of course, represent a substantial majority of the industries in the class concerned. When such rules and regulations are adopted by the association and approved by the workmen's compensation board and the lieutenant governor in council they become binding on all the manufacturers in the class represented. The associations so formed appoint inspectors to visit the different plants of the employers for the purpose of recommending such mechanical improvements or safety devices as may be considered important or necessary, encouraging and assisting in the development of safety work, and the formation of safety committees in the shops, and generally in promoting the work of applying the "ounce of prevention."

The Industrial Accident Prevention Association of Ontario, which embraces the several associations formed under the act, with their staff of seven inspectors, made approximately 10,000 safety recommendations last year. Each recommendation is followed up until a report is received from the employer that the recommendation has been satisfactorily disposed of. It is perhaps remarkable to note that the association has been able to obtain cooperation from the employers to such an extent that recommendations made are carried out as stated below:

Ninety per cent are carried out, as first made, without question.

Five per cent require some suggestion as to how the recommendation may be carried out.

Five per cent require some further explanation or reason given, or a second visit of the inspector.

A report of each inspection, showing the recommendations made and the disposition of each, is filed with the workmen's compensa-

tion board, which enables the board at any time to check up in case of accident, first, to see if the accident is one that could have been prevented, and, second, to find out the attitude of the employer toward accident prevention generally as applied to his plant.

Merit rating is a further inducement for the employer to cooperate with the work of the safety inspector.

The policy of the Accident Prevention Association is to act as advisers on safety work and assist in every way in devising means to apply mechanical devices or guards, where possible, and to assist in the organization of shop safety committees, solicit subscriptions for the bulletin service, and promote the use of safety warnings in shops.

In selecting inspectors for the work mentioned men of practical experience have been chosen, those who have had experience in the particular classes represented by the association. These inspectors meet frequently for the purpose of exchanging information and to establish certain standards to enable them to work on a plan that is uniform.

It is impossible, of course, to form any accurate judgment as to the extent to which accidents may have been prevented. It is interesting, however, to note the improved physical condition of the plants that have been under the supervision of these inspectors for the last few years. Frequent requests are received from employers for information and advice as to some plan they have under consideration for accident prevention.

WHAT INDUSTRIAL COMMISSIONS CAN DO TO PREVENT ACCIDENTS.

BY SIDNEY J. WILLIAMS, MANAGER, ACCIDENT PREVENTION DIVISION, NATIONAL SAFETY COUNCIL.

An essential to success in any safety campaign, whether State-wide or in an individual plant, is a proper balance between safeguarding and education. Education will prevent a greater number of accidents; safeguarding will prevent more serious accidents. Education brings the greatest results for the least money, and is therefore favored by the employer; safeguarding suggests laws, inspections, the "big stick," and has naturally been emphasized by most governmental departments. Education without safeguarding is not sincere; safeguarding without education is narrow. Either one without the other can achieve only limited success.

The pendulum swings back and forth, but each oscillation brings us closer to the golden mean. The employer who said a few years ago that all accidents were due to carelessness, and that legislative requirements were absurd and oppressive, was not entirely wrong; many legislative requirements were absurd and oppressive. Now, when State codes are framed by expert administrative bodies, guided by the best advice obtainable, such objection is not heard so often from the employer. Yet I know State departments in which the chief executive is beyond reproach in his sincere desire to give his people the best possible service, but where the arbitrary and unintelligent behavior of some of the field inspectors still gives employers just ground for complaint and prevents complete harmony of feeling and action. There is only one thing to do with such inspectors if the department is to be made really efficient.

On the other hand, State officers often have good reason for feeling that a certain employer has introduced a safety organization in his plant principally to cover up glaring defects in his mechanical equipment. Such camouflage, which does not deserve the name of safety education, is looked upon with disgust by every employer who is doing honest safety work, and I believe that the number of employers in the first-mentioned class is growing smaller, or at least the number who are doing honest work is rapidly increasing. This tendency in the right direction is hastened by the growing realization that in a plant of any considerable size the safety work can not be left to a committee or a system of committees, but should be in charge of an experienced full-time safety engineer. No safety engineer with the most rudimentary idea of honesty will attempt to conduct an educational campaign until he has at least made a start in correcting physical hazards. Reflecting this attitude, the National

Safety Council, which is essentially a cooperative organization of employers, is giving increasing attention to mechanical safeguarding and engineering revision. Of course, the council can not require the observance of standards on the part of its members; but it can cooperate with other national and State organizations, both public and private, in working out correct and reasonable standards, and can encourage the important work of underwriters' laboratories, in testing and labeling safety devices.

The progressive States here represented have broken away from the old idea of factory inspection based on legal authority alone, and have carried on extensive educational campaigns. But even aside from the occasional ignorant and unteachable inspector of the old school, to whom I have already paid my respects, few State departments, if any, have as yet made the fullest possible use of educational methods. The employer requires education, as well as the employee, and more can be accomplished in this way than by legal prosecutions. One excellent way of educating the employer, which several States are now using, is to confront him occasionally with a record of his own accidents. There is no time when the average employer is quite so ready to listen to suggestions from the department, as when he has just had a serious accident—provided the subject is not approached from the standpoint of "I told you so." In the case of small establishments, the accident experience of the entire industry must be used. If the employer's record shows a large preponderance of accidents due to overcrowding, disorder, and carelessness, the State should recommend not only a safety organization, but a safety engineer, as the only remedy for such accidents. I question whether any State has yet made the fullest possible use of such individual statistics.

It is generally agreed that the foreman can do more to help or harm the safety movement in a shop than any one else in the organization. The State department can do much to educate the foreman. I believe that foremen's meetings should, as a rule, be conducted by the factory inspector himself, in connection with his regular inspections. To supplement this personal contact, some departments are also publishing a monthly magazine designed principally for the foreman. This should preferably be sent to each foreman individually at his home.

For educating the workman himself, the up-to-date department will encourage the holding of safety meetings or safety rallies and will furnish speakers. Some States also distribute posters for the factory bulletin board. My opinion on this point was formed about a year ago, when I was engineer for the Wisconsin commission. The State department can not compete—at least it can not compete economically—with the weekly bulletin service of the National Safety

Council, either in quality or quantity. It is true that free distribution by the State will reach many employers who are not members of the National Council. A bulletin which costs nothing, however, is apt to be considered by the recipient as worth just about what it costs. A safety bulletin put up carelessly, or in the wrong location, or left for months until it becomes torn and dirty, is worse than no safety bulletin at all. Most of the Wisconsin inspectors agreed with me in this, and thought that instead of spending our money in getting out second-class bulletins of which a majority would go into the waste basket, we might better encourage employers to join the National Safety Council.

As I have already indicated, the formulation of standards or codes for safeguarding is peculiarly a governmental function, except in war time, when it is peculiarly a State function. During the past five years State industrial commissions have greatly advanced the science and art of formulating safety standards. How unfortunate it is, that while new safety codes are continually being adopted, and old ones revised, no serious effort has been made for uniformity! We are fond of saying that an administrative commission can formulate such a code much better than a legislature; yet the industrial codes thus adopted in different States are as little uniform as the statutes on marriage and divorce. The advantages of uniform safety standards in the different States will surely be admitted without argument; and I can not believe that the practical difficulties are insurmountable. A serious effort for uniformity should be made without further delay. In addition to all the various State standards, there are already several different standards of a national character, such as the standards of the schedule-rating committees of the Federal Safety Engineers, the United States Compensation Board, and (on certain subjects) the American Society of Mechanical Engineers. A movement for uniformity might well be started by this association, with the backing of the Federal Bureau of Labor Statistics and the Federal Bureau of Standards, and I urge most seriously that you take some action thereon at this meeting. This does not mean that every State must pledge itself to throw away its own standards and adopt others. It simply means that the State and national departments interested and other organizations such as the engineering societies, the insurance companies, and the National Safety Council would agree to get together and form a joint committee, the result of whose work might properly be termed a national standard; this national standard would then serve as a guide for States adopting new codes, and would naturally be given some weight when existing codes are being revised. Complete uniformity is doubtless impossible, and perhaps undesirable—but a measurable approach thereto can surely be made.

TUESDAY, SEPTEMBER 24—EVENING SESSION.

Chairman, Charles S. Andrus, Chairman, Industrial Commission of Illinois.

II. ADMINISTRATIVE PROBLEMS.

STATISTICS AS AN AID IN ADMINISTRATION.

BY W. H. BURHOP, SECRETARY, WISCONSIN COMPENSATION INSURANCE BOARD.

Five years ago the statement could have properly been made that administrative bodies of our States, dealing with compensation and labor laws, have woefully failed in the field of accident and workmen's compensation statistics; that they have failed to realize the value of statistics as an aid to the proper discharge of their public function. Unfortunately not all of our States even at this time fully appreciate the value of an adequate statistical department; too many still regard statistics as either unnecessary or simply as a record of what has been done, and not as a guide for future work or future legislation. True, it is possible to pay an injured man 200 weeks' compensation for the loss of an arm, if such is specifically provided in the compensation act without reference to statistics. Nor do we need statistics to establish a rule that a man engaged in the manufacture of gunpowder shall not smoke a pipe. It is unnecessary to know how many men have been killed or injured in order to determine that such occupations as blasting, window cleaning, or deep diving are dangerous. We know, without referring to figures, that 120 weeks of compensation, with a $10 weekly maximum, is utterly inadequate to compensate for the loss of an eye. To present these facts of common reason and knowledge is not the function of a statistical department.

There are at least four fields in which adequate statistics should be of material assistance if not indispensable to administrative bodies. They are accident prevention, administration of compensation, regulation of insurance rates, and proposals for further legislation.

In the first of these functions, accident prevention, the value of statistical records has been more universally appreciated than in other fields. Much could be said on this subject alone, but since this feature will be discussed on various occasions during this convention I will treat it very briefly.

Many of our States have done safety work for several decades or more. Without question, the requirements of safeguarding dangerous machinery has prevented some accidents which would have oc-

curred without the guards. Nevertheless, most of our safety work has not been based upon a statistical analysis of accidents, and with the possible exception of the State of New York, I know of no State which can show from accident figures what the fruit of safety work has been. Many Commonwealths have a record of the number of accidents from year to year, but this figure is absolutely meaningless if not correlated with the number of full-time workers exposed to injury in the various industries. An increase of 20 per cent in the number of accidents may actually mean a decrease in the accident rate based upon the number of men employed, and, conversely, a reduction of 20 per cent may really be an increase if the number of workers exposed to injury has been decreased in a larger proportion. Taking all industries of the State, we have at present no information to compare properly even the number of accidents from year to year.

To make an intelligent campaign for the prevention of accidents, we must, first of all, know how accidents occur. What means a detail analysis of the causes of accidents? The use and benefit which a table of causes of accidents presents to a safety department is in direct proportion to the detail of the table with proper summaries of similar causes. A statistician gives little information to the safety inquirer when he tells him that 5,000 workmen were injured in falling from elevations, or even that 500 injuries resulted from circular saws. He adds value to his figures when he says that 200 men were injured by fall from ladders or from scaffolds. But even such information is wholly inadequate for the safety man. He must know in greater detail the circumstances which produced the fall. He must have such information as will enable him to determine how similar accidents can be prevented. Falls from ladders may occur because of a defective rung; the ladder may slip; it may tip over; or the workman may fall because of carrying too heavy a burden. The mode of prevention varies in each one of these various causes. Similarly with the falls from scaffolds. The scaffold itself may fall because of defective construction or faulty braces; absence of a rail may cause a fall; or overloading may cause a collapse. All these separate significant circumstances must be known to prescribe rules and emphasize their importance.

This detail applies to machine accidents as well as nonmachine accidents. If we told the man on the street that in one year circular saws in Wisconsin were responsible for 405 injuries, causing more than seven-day disability, he at once would picture a man pushing a board through a saw and striking his hand against the fast moving tool. As a matter of fact this conclusion could apply to only 243, or a little over one-half of the total injuries. Of the others, 29 men were injured because they attempted to clean the machine while

it was in motion, 67 were struck by so-called "throw backs," 9 were injured because their loose clothing was caught, 6 accidents occurred because of oiling the machine, etc. This is the information which is vital for accident prevention. We must know why and how the injury occurred before we can intelligently suggest means of prevention.

To measure the results of safety work we must have records of exposure. We should know not only the total number of men employed in the State, but these numbers should be analyzed by the various industries. Only with this information, correlated with the number of accidents, can we determine the rise or face of our accident curve.

To a somewhat less degree, but of great importance, are records an aid to the man who must approve claim statements or award compensation. This is especially true if permanent partial disabilities are not compensated on the basis of a fixed schedule, but on the basis of loss of earning power. In such cases the records of past judgments must serve as a future guide or no uniformity can result.

In order to picture the operations of compensation laws and determine the administrative efficiency, records should show the number of compensable accidents reported and compensated, classified as to the nature of injury, the claims which are settled automatically, and those brought before the administration body, or carried through the courts. The time required to dispose of a disputed claim is a test of efficiency. Claims which are rejected should be classified by grounds of rejection. Approval or denial of lump-sum statements should be correlated with the reason for such action. The amount of indemnity and medical aid paid should be tabulated according to the various classes of injuries. The cost of administration, together with legal and all other costs of adjusting claims, is an important item. Here, again, detail must be emphasized. The total number of permanent injuries to the index finger is insufficient; such injuries should be classified by joints at which amputations were made or upon the basis of which the degree of permanent disability was established. The importance of this detail will be apparent when the cost of future legislation is considered.

While most of these suggestions contemplate in a measure a picturization of the application of the compensation act, and an accounting of the work of the administrative body, statistics are often the basis of individual claim settlement. In Wisconsin a minor who is permanently injured is compensated upon the basis of what he could have earned in his occupation, when he attained his majority. Under these conditions, it is important to know what adults in his line of work are earning. In other words, we must have wage statistics

showing the amount of wages paid to men over 21 years of age in the various industries.

As a further illustration of the use of statistics in the adjustment of claims, presume that a man who has sustained a hernia refuses to submit to an operation. Without such an operation his disability may be indefinite, while an operation would effect a rapid recovery of earning capacity. It would obviously be unfair to compel an employer or his insurance companies to pay compensation indefinitely under such circumstances. There could be no fairer way to adjust such a claim than to allow compensation for the average period of disability for similar cases. In Wisconsin we know that the average disability of 491 hernia cases is 41 days, and this offers a basis of settlement.

The extent or degree of aid which statistics may offer in the administration of compensation must obviously depend upon the manner in which compensation laws provide for claim adjustment. This is a problem of the individual States, and their statistics should be adjusted in accordance to their specific needs.

A discussion of statistics for the regulation of insurance rates may be somewhat out of order because not all of the organizations here represented have supervision over this feature. Unfortunately, some States have no rate regulation laws whatever, or have no means of enforcing them.

In no field of insurance is rate regulation so necessary and so essential as in workmen's compensation. The State is compelling its employers to purchase insurance and compels employees to accept whatever coverage their employers may legally secure. In other words, the employer is forced by the State to carry insurance for the benefit of his employees, but those dependent for their compensation upon the insurance carrier have no voice in the insurance contract. Having made insurance compulsory, the State should in justice protect the employer against excessive or unfair rate charges, and the employees as well as the employer against companies on an inadequate rate basis, which can lead only to insolvency and failure to pay compensation claims.

Further than this, employers should pay into the loss fund a premium charge in proportion to their respective hazard. There should be no discrimination between employers whose work presents a similar degree of hazard.

Some of our States now have on their statute books antidiscriminatory laws, but, because of lack of statistics, administrative bodies themselves have no method of knowing if rates are right or wrong, fair or unfair, as to classes and employers. Supervision of insurance means nothing whatever unless supervising officials secure the neces-

sary information upon which rates must be based. The proper source for this information is the insurance carrier. All that is required is a statement from each company showing the pay roll and clasified losses for each industry class. The reports of the various companies can then be combined into the total class experience for the State.

Much time could be given to the discussion of this subject, but it is here presented only for the thought of those States having no rate regulatory laws or no means for enforcing such.

Compensation laws of our States have been passed without adequate information regarding existing conditions or sufficient understanding of the problems which such laws were intended to solve. No more convincing proof of this is needed than the fact that the laws of practically all the States are amended during every legislative session. The application of the acts are extended and the scale of benefit is constantly revised upward. In order that such future legislation may be based upon sound experience, it is imperative that detailed records of compensation and medical payments, classified by nature of disability, be maintained; also other statistics regarding the scope or adequacy of the acts.

We should be able to determine the extent to which our acts indemnify the actual wage loss. Only from such a tabulation can we determine the adequacy of the scale of compensation. The actual wage loss and medical cost compared with the actual benefit received for the various classes of injuries will picture the adequacy of our payments. In the wage loss obviously should be included the waiting period.

Such a tabulation, while of great importance, does not tell the entire story. If possible, we should follow our injured men through their lives and learn how large a loss of earning power has resulted on account of a permanent injury. Most of the States compensate permanent injuries on the basis of a fixed scale of benefits. These scales are not based upon scientific information and are not designed to compensate fully for the loss of a member of the body. Even if a scale giving full compensation were attempted, we would not know how to construct it because we have not been farsighted enough to study the actual results of the various permanent disabilities. Not only are we ignorant of the wage impairment of specific injuries, but we do not even know, except as common sense may dictate, the relative significance of the various kinds of injuries. In Wisconsin the loss of an arm at the shoulder is compensated by 20 weeks more than the loss of a leg at the knee. No information is available to establish the relative loss of earning power which these two disabilities produce. It is to place a scale of compensation upon an adequate and balanced basis that statistics of future wage loss are essential.

Changes in the benefits of a compensation law are largely compromises between labor and capital. A proposal to reduce the waiting period or increase the maximum is always met with much objection; that the increased cost would be a crippling burden to industry. Unless an analysis of the various kinds of injuries with the respective benefits is available it is impossible to determine in advance the increased cost of any amendment revising the scale upward. If we have a list of permanent partial disabilities with the cost for each class and changes in the specific number of weeks are proposed, it is an easy matter to determine the result in cost of proposals. If we have a correlation of the number and cost of cases with wages earned, we can readily determine the effect of a change in the maximum or minimum provisions.

An amendment introduced during the 1917 session of the Wisconsin Legislature provided that the fixed benefits of the scale should be intended to cover only the permanent disability and that the healing period should be compensated for in addition. That is to say, the proposal would have added the healing period to the schedule. To determine the additional cost, all permanent injuries were tabulated according to kind of inquiry and duration of the healing period. From the tabulation the Wisconsin commission was able to advise the legislative committee of the increased cost. So with all the other legislative proposals. We need detailed experience of the past to give intelligent advice on further legislation.

An abundance of illustrations could be given to show the real need of statistics for administrative use. American labor boards must realize more and more the value of tabulated experience. Much thought and time has been given to this subject by your committee on uniform statistics and insurance cost. It is gratifying to note that many of the States are already endeavoring to meet the committee's recommendations, partly for their own administrative needs and partly to place American statistics on the so-much-needed uniform basis. The time will soon be at hand when an adequate statistical department will be considered an absolute necessity by every organization dealing with compensation and safety laws. Until such time we can not hope to proceed upon a thoroughly scientific basis, using our experience to indicate our errors and guiding us for future improvements.

HOW SHOULD PERMANENT PARTIAL DISABILITY BE COMPENSATED?

BY JOHN MITCHELL, CHAIRMAN, NEW YORK STATE INDUSTRIAL COMMISSION.

Inasmuch as this is a convention in which various States are represented, the provisions of the compensation law of New York with reference to the subject of this paper will be taken as the basis of my remarks. This is done also for the further reason that the present New York statute contains certain amendments which are the outgrowth of a considerable experience in compensation matters and which have tended to perfect the requirements of the law so that as it now stands it is one of the best laws in the country in respect to the subdivision under discussion and approximates that which I believe will have more or less permanence in compensation laws.

What remarks I shall have to make will be independent of the consideration of certain general phases of compensation laws, such as the waiting period, percentage of compensation allowance, the medical question, and, independent also, of any suggestions as to the number of weeks in the specific schedule, etc., but will be confined strictly to the subject itself.

The New York statute is as follows:

3. Permanent partial disability. In case of disability, partial in character but permanent in quality, the compensation shall be 66⅔ per cent of the average weekly wages and shall be paid to the employee for the period named in the schedule, as follows:

Thumb.—For the loss of a thumb, 60 weeks.

First finger.—For the loss of a first finger, commonly called index finger, 46 weeks.

Second finger.—For the loss of a second finger, 30 weeks.

Third finger.—For the loss of a third finger, 25 weeks.

Fourth finger.—For the loss of a fourth finger, commonly called the little finger, 15 weeks.

Phalange of thumb or finger.—The loss of the first phalange of the thumb or finger shall be considered to be equal to the loss of one-half of such thumb or finger, and compensation shall be one-half of the amount above specified. The loss of more than one phalange shall be considered as the loss of the entire thumb or finger. Where the injury results in the loss of more than one finger, compensation therefor may be awarded for the proportionate loss of the use of the hand thereby occasioned: *Provided, however*, That in no case shall the compensation awarded for more than one finger exceed the amount provided in this schedule for the loss of a hand.

Great toe.—For the loss of a great toe, 38 weeks.

Other toes.—For the loss of one of the toes other than the great toe, 16 weeks.

Phalange of toe.—The loss of the first phalange of any toe shall be considered to be equal to the loss of one-half of said toe, and the compensation shall be one-half of the amount specified. The loss of more than one phalange shall be considered as the loss of the entire toe. Where the injury results in the loss of more than one toe compensation therefor may be awarded for the proportionate loss of the use of the foot thereby occasioned: *Provided, however,* That in no case shall the compensation awarded for more than one toe exceed the amount provided in this schedule for the loss of the foot.

Hand.—The loss of a hand, 244 weeks.

Arm.—For the loss of an arm, 312 weeks.

Foot.—For the loss of a foot, 205 weeks.

Leg.—For the loss of a leg, 288 weeks.

Eye.—For the loss of an eye, 128 weeks.

Loss of use.—Permanent loss of the use of a hand, arm, foot, leg, eye, thumb, finger, toe, or phalange shall be considered as the equivalent of the loss of such hand, arm, foot, leg, eye, thumb, finger, toe, or phalange.

Partial loss and partial loss of use.—For the partial loss or the partial loss of the use of a hand, arm, foot, leg, or eye compensation therefor may be awarded for the proportionate loss or proportionate loss of the use of such hand, arm, foot, leg, or eye.

Amputations.—Amputation between the elbow and the wrist shall be considered as the equivalent of the loss of a hand. Amputation between the knee and the ankle shall be considered as the equivalent of the loss of a foot. Amputation at or above the elbow shall be considered as the loss of an arm. Amputation at or above the knee shall be considered as the loss of the leg.

The compensation for the foregoing specific injuries shall be in lieu of all other compensation, except the benefits provided in section 13 of this chapter.

In case of an injury resulting in serious facial or head disfigurement the commission may, in its discretion, make such award or compensation as it may deem proper and equitable in view of the nature of the disfigurement, but not to exceed $3,500.

Other cases.—In all other cases in this class of disability the compensation shall be 66⅔ per cent of the difference between his average weekly wages and his wage-earning capacity thereafter in the same employment or otherwise, payable during the continuance of such partial disability, but subject to reconsideration of the degree of such impairment by the commission on its own motion or upon application of any party in interest.

4. Temporary partial disability.—In case of temporary partial disability, except the particular cases mentioned in subdivision 3 of this section, an injured employee shall receive 66⅔ per cent of the difference between his average weekly wages and his wage-earning capacity thereafter in the same employment or otherwise during the continuance of such partial disability, but not to exceed when combined with his decreased earnings the amount of wages he was receiving prior to the injury, and not to exceed in total the sum of $3,500, except as otherwise provided in this chapter.

(This paragraph is also incorporated as reference to it will be made below.)

5. Limitation.—The compensation payment under subdivisions 1, 2, and 4 and under subdivision 3, except in case of the loss of a hand, arm, foot, leg, or eye, shall not exceed $15 per week nor be less than $5 per week; the compensation payment under subdivision 3 in case of the loss of a hand, arm, foot, leg,

or eye shall not exceed $20 per week nor be less than $5 a week: *Provided, however,* That if the employee's wages at the time of injury are less than $5 per week he shall receive his full weekly wages.

6. Previous disability.—The fact that an employee has suffered previous disability or received compensation therefor shall not preclude him from compensation for a later injury nor preclude compensation for death resulting therefrom; but in determining compensation for the later injury or death his average weekly wages shall be such sum as will reasonably represent his earning capacity at the time of the later injury: *Provided, however,* That an employee who is suffering from a previous disability shall not receive compensation for a later injury in excess of the compensation allowed for such injury when considered by itself and not in conjunction with the previous disability.

7. Permanent total disability after permanent partial disability.—If an employee who has previously incurred permanent partial disability through the loss of one hand, one arm, one foot, one leg, or one eye incurs permanent total disability through the loss of another member or organ, he shall be paid, in addition to the compensation for permanent partial disability provided in this section and after the cessation of the payments for the prescribed period of weeks, special additional compensation for the remainder of his life to the amount of 66⅔ per cent of the average weekly wage earned by him at the time the total permanent disability was incurred. Such additional compensation shall be paid out of a special fund created for such purpose in the following manner: The insurance carrier shall pay to the State treasurer for every case of injury causing death in which there are no persons entitled to compensation the sum of $100. The State treasurer shall be the custodian of this special fund, and the commission shall direct the distribution thereof.

First, let me call your attention to the fact that the schedule herein is a well-balanced schedule, and that relatively the economic value of the various members seems to be properly stated. However, in the administration of the law, we always have given consideration to the vocational element to modify the rigidity of the schedule. This is recognizing the spirit of the law as well as the letter. If I were drafting a new statute I should introduce an element of discretion on the part of the hearing tribunal, allowing an increase, say, up to 33⅓ per cent for vocational reasons alone.

In the consideration of the vocational element the New York commission has not diminished any award on such account, but has been more liberal in its interpretation of the schedule in numerous instances, of course, being bound at all times by the statutory limitations. There was a time when our statute compelled us to consider any injury short of loss of or loss of use of a member as a simple disability case in which payments should be made covering the period of disability only; but, by the very necessary amendment the commission now has power to make an award on proportionate loss of use of member. Indeed, even before such amendment, the commission followed this practice, which was not objected to in minor cases, but which finally came to be seriously objected to in the more expensive cases until a court decision prevented a continuance of the

practice. To illustrate what hardship might result in the absence of such provision, I will cite a case in the New York jurisdiction. It was one in which there had been an eye injury followed by an operation for cataract with a result of loss of binocular vision, coordination of vision of the two eyes being lacking. It was even true that the claimant could see better at his work with his injured eye covered with a patch; but inasmuch as, in the event of the subsequent loss of the uninjured eye, the injured eye would be useful if for no other reason than to give a field of vision and enable the injured person to get around, the court held that there was no loss of use of eye. The case, therefore, was reduced to one of simple disability, in which a few weeks' compensation was paid while the injured eye was healing; so that we have the situation of one who for vocational purposes had lost one eye receiving less compensation for it than if he had lost his little finger. Such an adjudication must rest in its last analysis upon the assumption that the injured eye will subsequently be lost; whereas such instances are exceptionally rare. Such a statute is not satisfactory either in its particular or in its general application and, plainly, laws should be so drafted or amended as to allow justice to be done in the circumstances.

It is manifestly a wise provision to give discretionary powers to the hearing tribunal to make an award for the proportionate loss of use of hand or foot or arm when certain portions of them are lost, for not only is the part lost but likewise does its loss impair the general utility of the member when considered as a whole.

There is justification also for granting compensation for certain disfigurements, for they result in impaired earning capacity quite as certainly as does the loss of a member or part of a member.

It is a wise provision of any law that gives to the claimant who is willing to return to work, but who is compelled to accept a lower wage because of his disability and during his disability, two-thirds of the difference between his old and new wage with certain maximum limitations. It tends to do away with malingering and encourages recovery; more than that, it is simple justice.

It is also proper to increase the maximum compensation in cases of the loss of a hand, arm, foot, leg, or eye, for the obvious reason that these are such serious injuries, attended with such great loss and inconvenience through life that they should be more amply compensated. In this connection, I may say that we are not apt to err in this respect, because the whole scheme of compensation is still well within the limitation of justice.

New York did wisely in amending her law to give compensation for permanent total disability in cases in which a claimant loses a hand, arm, foot, leg, or eye, having previously suffered the loss of one or more members. The totality is no more chargeable to the last acci-

dent than to the first, for it is the combination of injuries which produces the totality. It is therefore unjust to charge the last employer with totality, whereas it would be unjust to deprive the workman of the benefit of his award for total disability. The proper rule, therefore, would seem to be to charge the present employer with the results of the last accident and to throw the combination result of totality upon industry as a whole. This may be done by adding a small additional rate upon every risk or, as New York has done it, by collecting in each death case in which there are no dependents a fixed sum of $100, which contribution seems sufficient to establish a fund to take care of the permanent total cases. One splendid effect of this amendment was to do away with the objection of employers to employing or reemploying crippled or defective workmen. The latter have a natural right to earn a livelihood. At the same time, employers were somewhat justified in their precautions. Now, cripples will be employed for what they are worth, and any objection to employing them has its answering advantage. So, it turns out that after the first fear is over, that cripples are being employed or, at least, are not rejected because of any provisions of the compensation law of New York State.

Dismissing the specific schedule, let us turn to the other permanent partial disabilities which are very numerous. I have in mind those cases of stiff elbows, arms that can not be fully elevated, wrists that have lost their suppleness, ankylosed fingers, inverted or everted feet, knees that have lost their flexion, etc. The statutory method of paying compensation in such cases is to provide two-thirds of the difference between the old wage and the new. The administrative difficulties are numerous:

Suppose the claimant refuses to return to work; here we have the discussion thrown upon the theoretical plane, one party contending that he is able to work, another that he is unable to work, and all the time perhaps no job in sight. Manifestly, compensation problems are practical problems and methods of adjudication should always be at hand and susceptible among other things of finality; but who has the ability properly to determine the question?

Suppose industrial conditions change and the injured workman is able to earn more money than he was earning at the time of the accident; shall we say in justice that he should go through life with a stiff arm without any compensation for it?

Or suppose the industrial conditions change so that because of the change alone he earns $8, whereas he might have earned $12 if conditions had remained as they were at the time of his accident. Shall the employer or the insurance carrier be compelled to increase compensation for reasons quite apart from the employment or the injury or its effect?

Or suppose conditions of intermittent employment in which the injured workman is sometimes employed and sometimes not; is the administrative bureau to be burdened with a rehearing of the case upon all such occasions? And, yet, if this be the method there is no escape from the endless rehearings of cases which as the years go by will aggregate a vast number.

The method followed in New York in such cases is to allow the workman and the employer (or his insurance carrier) to present themselves before the commission with a proposition to adjudicate compensation by a single payment commuting all future payments. More than 5,000 cases a year are thus adjusted. Such a method veritably forced itself upon the commission and there seems to be no other satisfactory method of adjudicating these cases. What are the defects of such a plan? Manifestly they are two: First, the danger of introducing the "settlement," so called, in which the obnoxious element of the old plan may be perpetuated. Second, the danger which always attends the giving of compensation in a lump sum against which is the general tendency of all compensation laws. With respect to the settlement feature this is entirely avoided by the commission's active interest in every such case. To guarantee adequate compensation the practice in New York is for the commission to pass an independent judgment on the matter regardless of the amount agreed upon and if the latter be not as much or more than the amount the commission thinks should be paid and received, the proposal is not accepted and approved and the parties are urged to raise the amount; otherwise, the case goes back upon the impaired earning capacity basis.

With respect to allowing the payment in one lump sum this is found to be a not undesirable element in this particular class of cases, but the commission should order its payment periodically where there is indication that it otherwise might be wasted. From this a general approval of lump-sum payments should not be inferred, for as a rule the periodical payments effect the greater good and it is wisdom to continue them; but in the particular class of cases it is very often the only practical way of meeting the situation.

"ARISING OUT OF AND IN COURSE OF EMPLOYMENT."

BY GEORGE A. KINGSTON, COMMISSIONER, WORKMEN'S COMPENSATION BOARD OF ONTARIO.

Perhaps no expression made use of in compensation laws has been the subject of more consideration and discussion by administering boards and law courts than that which constitutes the subject of this paper.

People sometimes say that the modern compensation law provides for compensation in case of all work accidents regardless of the question of negligence, and that probably is the general conception of the law, but in 39 out of the 48 jurisdictions on this continent (i. e., 40[1] in the United States and 8 in Canada) where a workman's compensation law is in force there is ingrafted upon the more general expression of the law the provision that an accident to entitle a workman to compensation must have happened in course of and must also have arisen out of his employment.

The eight jurisdictions whose laws do not include this expression are Ohio, Pennsylvania, Texas, Washington, West Virginia, Wisconsin, Wyoming, and the United States.

I will briefly state the expressions used in the laws of these States in lieu of the uniform wording of the other laws in this respect:

Ohio.—"All injuries not self-inflicted received in course of employment."

Pennsylvania.—"Injury by accident in course of employment."

Texas.—"Personal injury sustained in course of employment."

Washington.—"Personal injury whether received upon the premises or at the plant or in the course of employment while away from the establishment."

West Virginia.—"All personal injuries not the result of willful misconduct or intoxication of employee or self-inflicted."

Wisconsin.—"Personal injury while performing service growing out of and incidental to the employment, not intentionally self-inflicted."

Wyoming.—"Personal injuries as a result of employment and not due to culpable negligence of injured employee or to the willful act of a third person due to reasons personal to such employee or because of his employment."

[1] Including Alaska and the Federal Government.

United States.—"Personal injury sustained while in the performance of duty."

It will be readily seen that in a number of cases this expression "Arising out of and in course of employment" substantially modifies the general principle that all work accidents are compensable, regardless of negligence or fault on the part of the workman.

These may be conveniently enumerated under the following headings:

1. Street accidents.
2. Accidents while going to or from work.
3. Injuries due to scuffling, larking, or horseplay.
4. Accidents, as sometimes stated in legal textbooks, caused by the act of God or the country's enemies.
5. Injuries arising out of attempted robbery, fighting, assault, murder, or suicide.
6. Disabilities due to frostbite or heat stroke.
7. Accidents occurring during moments of leisure or while doing something of a personal nature or out of curiosity.
8. Camp accidents.
9.[1] Accidents resulting in the aggravation of a preexisting diseased condition, or extraordinary conditions amounting almost to accident, resulting in disease, as e. g., pneumonia resulting from exposure.
10.[1] Accidents due to disobedience of rules.
11.[1] Hernia, lumbago, and strain cases.

One could go on almost indefinitely classifying occurrences which seem to fall outside the commonly accepted idea of "work accident," but the above list comprises the great bulk of cases presenting problems which administering boards and commissions are constantly confronted with, and it is the purpose of this paper to discuss some of the principles underlying the decisions in cases coming under these headings.

STREET ACCIDENTS.

Prior to the decision of the House of Lords in the case of Dennis *v.* White, June 14, 1917, there was a fairly well-settled line of decisions in England in regard to street accidents, to the effect, briefly stated, that if a workman is on the public highway on his master's business and becomes injured by accident due to ordinary street hazard, such an injury is not compensable, because it could not be said that the accident arose out of his employment, or, in other words, as some of the judges expressed it, it was due to a risk no greater than is run by all members of the public.

One of the leading cases in which this principle of law was expounded was the famous banana skin case, Sheldon *v.* Needham,

[1] Consideration of decisions under this head is not included in this paper.

7 B. W. C. C. 471, where an employer sent his servant to post a letter at a box a few yards along the street. While performing this duty, she slipped on a banana skin carelessly thrown on the sidewalk and broke her leg. For the reasons stated above it was ultimately held by the court of appeals that the employer was not liable.

The New York Supreme Court, in the case of Newman *v.* Newman, took the same view, and the idea seems to have been accepted in quite a number of the other States.

It was held in another English case, Pierce *v.* Provident (1911), 4 B. W. C. C. 242, that in order to make the employer liable in the case of street accidents employment in the streets must be practically continuous, as in the case of a canvasser or collector, the reason for drawing the distinction being thus expressed by the master of the rolls:

> As the work requires him to spend the greater part of the day on the streets he would be, in the course of his duties, beyond all doubt more exposed to the risks of the street than ordinary members of the public.

The Scottish courts, however, held a different view. As one of the judges put it:

> The risk of the road at the particular time was a risk incidental to the employment, and it was none the less a risk of the employment because every pedestrian on the road at that time ran the same risk, or because the workman was facing this risk for the first or perhaps the only time.

Very early in the administration of the law in Ontario, i. e., in 1915, the board was called upon to decide this identical question. A man employed by one of the cartage agents in Toronto was sent to a harness maker's shop some few blocks away to get a horse collar which had been left there for repairs, and on the way back slipped on the sidewalk and broke his arm.

Our board, while entertaining the most profound respect for the decision of the English courts, is not bound to follow them, and the reasons as stated in the Sheldon case in regard to these street cases did not appear to us to be sound. We finally decided to adopt the view expressed by the Scottish courts and allowed the claim.

It was, you may be sure, quite interesting to note that the House of Lords a couple of years later in the case first above referred to, Dennis *v.* White, 10 B. W. C. C. 280, discarded the theory or rule previously laid down by the English court of appeal as applying to this type of case and adopted the view expressed by the Scottish courts.

The written judgment of Lord Chancellor Finlay in this case deals very fully with all the prior decisions of importance on this subject and refers to the reasoning of these earlier decisions as unsound and antagonistic to the terms of the statute.

I have had the opportunity of reading the written opinion of the chairman of the Nova Scotia board, Mr. V. J. Patton, in the matter of the claims arising out of the Halifax disaster of December last. The reasoning in the case of Dennis *v.* White was adopted, and it was held that claims in respect to killed or injured workmen in Halifax on that occasion should be taken as coming under the provisions of the act, it being considered that the injury arose out of the employment because, by reason of the nearness of the city to the shipping in the harbor where high explosives were handled, all workmen in the city, whether engaged on the street, in the factory, or on the piers, were specially exposed to that particular danger.

ACCIDENTS WHILE GOING TO OR FROM WORK.

Somewhat closely related to the problem of compensation for injuries in street accidents is that as to accidents happening while going to or from work. It is, I think, fairly generally held that after a workman leaves the employer's premises on quitting work or before he reaches the premises on going to work, he is not in the course of his employment, and an accident happening to him on the street during these periods could not be said to arise out of his employment.

The New York commission in one case went a step farther and rejected the claim of an office employee, who on finishing her day's work took some of her employer's letters to deposit in the post office and on the way was struck by a train. The reason stated for this decision is "that she was following the same route that she would have followed if she had been going home without undertaking to mail the letters and that she was exposed to no unusual hazard due to the employment." This sounds rather like the argument formerly given effect to in England prior to the decision of the House of Lords in Dennis *v.* White above referred to. It seems to me such a case should turn on whether or not she was in the performance of her duties. If it was her duty to go to the post office on this message, then for the time being the hazard of the street was a hazard of her employment and her duties for her employer were not ended till she deposited the letters in the post office.

A number of cases have arisen where a workman is injured going to or from work by means of a conveyance provided by the employer. The question to be determined in all such cases is, Was it an express or implied term of the contract of service that the workman was to be so carried to or from his work? It seems to be well-settled law in England that if a workman is entitled either by express or implied contract to travel in a conveyance provided by the employer he is in the course of his employment, and an accident while so traveling would be held to have arisen out of the employment even though he

is not on the employer's time till the place of actual work is reached. Both California and Massachusetts have held to this effect also in cases reported from those States.

We had one case in which we allowed the claim of a workman who was injured on the steps at the entrance to the building, part of which was occupied by the employer. We held that in renting a room or suite of rooms in a building the common entrance to the building should be considered in this connection as part of the employer's premises, and the hazard of the steps was a hazard peculiar to the employer's premises.

The Supreme Court of Massachusetts held to the same effect in a case which recently came before them, In re Sundine, 105 N. E. 433.

The following are a few additional cases of this class which have come before the Ontario board:

Allowed—

Where the foreman of a teaming company, when quitting work in evening at sand pit, got on one of his employer's wagons to ride into town, jumped off wagon at his street intersection, and was hurt by passing auto.

Where a workman employed by a railway at terminal yards about 4 miles outside the city was killed by train which he was about to board in the city to take him to his work. Usual custom for railway to carry men to their work at this point. Board considered case arose out of employment though workman's time did not actually start until arrival at work.

Where a man going to work in a lumber yard which adjoins railway tracks was killed by passing train as he was crossing the tracks to work. Considered he had reached the ambit of his employment.

Where a man on engineer's staff going into a lumber camp from town—pay started when he left town—broke through ice and drowned.

Where a car inspector who had evidently finished his day's work three-quarters of an hour before usual quitting time came into town as per usual custom by company's train. Evidently jumped off or jerked off near station, though no one saw accident. Body found alongside track.

Where a man employed by one of the tenants of a building entered the elevator in common use by all tenants of the building, and, instead of waiting for the operator, pulled the rope himself and was killed. Considered that the elevator was part of the premises rented and constituted one of the hazards of the business.

Where a man employed by a cartage agent was out plowing on a farm near town for a customer. On way home from work horses ran away.

Not allowed—

Where a man had been told the night before to go down to get work at an elevator in the morning. While on the way to work along railway track near the place where he was to be employed, about 9.30 or 10 a. m., he was hurt by train.

Where a man going from work in the woods instead of taking the company's bush road came out on railway track and was killed by train.

Where a railway workman on bridge work had been given a ticket home for Christmas holidays and return. On returning he jumped off the train at about the place where his work would be and was injured. This would have saved him a walk back from the station of about a mile.

Where a man working for a railway as section man, after quitting work in evening, jumped on passing freight to go down the yard to where he had hung his coat when starting work and was injured.

Where a man having met with a certain injury the day before asked leave at 11 a. m. to go two or three blocks along street to an emergency hospital to get injury dressed. This took him across railway tracks. On returning, finding a train blocking the crossing, he attempted to climb through and got foot cut off.

INJURIES DUE TO SCUFFLING, LARKING, OR HORSEPLAY.

There have been a variety of opinions expressed on this type of case both in England and on this continent.

It was held in the recent case (1916) of Parsons *v.* Somerset, 9 B. W. C. C. 532, that where a railway porter in the course of his employment met with an accident due to his getting on the footboard of a car after the train started, not for any object of his employment but purely for his own pleasure (larking with two young ladies on the train), he was not entitled to compensation.

In another case, Wrigley *v.* Nasmythe, where a workman who went for some purpose to a fellow workman in the shop, on parting tapped his friend on the back with a rule, and received a push in return from which he was injured, it was held by the court of appeal that the accident did not arise out of the employment.

Our board in Ontario has adopted the rule in these cases that if the injured workman is an active participant in the scuffling or horseplay he is not entitled to compensation, but if while going about his duties he is the victim of another's prank, to which he is not in the least a party, we do not deny him compensation.

I note the following cases from my records coming under this heading:

Allowed—

Where a Chinaman employed in a factory was the innocent victim of horseplay—blown up by hose.

Where a man who had been teased by another workman suddenly turned in revenge and hit an innocent party.

Where a man about to punch the time clock was hit from behind by another workman. Injured man innocent of any horseplay.

Where a man in line up for the time clock was pushed out of line by another workman, and to prevent himself from falling, as well as to save his place in the line, he grabbed the workman and his hand came in contact with a sharp knife in the latter's hand.

Not allowed—

Where, when a man splashed a little water over another workman, the latter in trying to avoid the water turned suddenly and, having hose in his hand, turned it on the man who first started the horseplay.

INJURIES ARISING OUT OF AN ACT OF GOD OR THE COUNTRY'S ENEMIES.

Under this heading about the only type of case in which the question has arisen is that due to lightning, but there have been a few cases reported during the last two or three years in England arising out of bombardments by enemy ships or airplanes.

In regard to lightning, the State boards or courts are not by any means uniform in their decisions and it can scarcely be said that there is in this country anything like a well-settled opinion.

The Supreme Court of Michigan recently held that a railway section man, who sought shelter from a storm in an adjacent barn which was struck by lightning and who was injured, was not entitled to compensation, basing this decision on the argument that the risk was not different from the risk run by other members of the community.

The Supreme Court of Wisconsin also held that where a man working on a dam was killed by lightning, it was not a case for compensation.

The Supreme Court of Minnesota, however, took an opposite view and allowed compensation to a workman who was injured by lightning while seeking shelter under a tree at the time of a storm.

In those jurisdictions where only the first of the two conditions are required—that is, injury by accident during the course of employment, omitting "arising out of, etc."—there can, of course, be no question, as an injury by lightning is certainly an accident and if this injury takes place during the period of work the condition is complete. I should scarcely have thought that it could be argued where a man goes into a building or under a tree to seek temporary shelter from a storm, that he has therefore left the employment, yet this point did arise in the supreme courts of both New York and Minnesota, and it was held that thus temporarily seeking shelter was not leaving the employment but rather was incidental to it.

The decisions in England in lightning cases turn on the question of special risk. Thus, for example, a steeple jack repairing a flag pole is considered to be specially exposed to the danger of lightning; likewise a man working on the top of a high scaffold was considered exposed to special danger and compensation was allowed. But where a roadman engaged in his ordinary occupation on the highway was struck by lightning, it was held that there was no special exposure to the danger of lightning and compensation was refused.

It amounts to practically this in England, that in all lightning cases the claimant must prove by positive evidence that the circumstances of the employment exposed the employee to a greater risk than that run by persons not so employed or not so employed under the same conditions.

The bombardment cases in England turn on much the same point as the lightning cases, viz, the question of special risk or special exposure due to the employment.

In this connection dicta by Lord Chancellor Finlay in the Dennis *v.* White case above cited are of interest. He says:

> In the case of injury by bomb thrown from hostile aircraft, the fact that workman was engaged on work on a building brilliantly lighted so as to attract the notice of enemy crews might be most material as showing that the injury by the bomb was one which arises out of the employment.

It was actually held in one case (Allcock *v.* Rogers, W. N., December, 1917, p. 353) where a servant in a hotel, whose duties were, among other things, to polish the brass name or sign plate on the outside of the building, was injured by the explosion of a bomb dropped in the street a short distance away, that this did not arise out of the employment, or, in other words, that the workman was not exposed to any special risk incident to his employment.

In the famous Hartlepool case (Cooper *v.* N. E. Ry. Co.) the decision was similar. In that case an engineer, having left his engine to seek shelter while the bombardment was on, ventured back to open the injector in order to prevent damage to the fire box and upon returning again to shelter was injured by a bomb. It was held by the court of appeal that this injury did not arise out of his employment. As a master of the rolls expressed it:

> The claimant must prove that he was exposed by the nature of his employment to some special or peculiar risk beyond that of other inhabitants of Hartlepool. The whole town was within range of the guns and there was no evidence or suggestion that they were directed at any particular spot.

INJURIES DUE TO ATTEMPTED ROBBERY, FIGHTING, ASSAULT, MURDER, OR SUICIDE.

I suppose every administering board has occasion frequently to determine cases coming under this heading, and from all the reports I have been able to read it seems quite a generally accepted principle of law in every jurisdiction that where a workman in the discharge of his duty is assaulted either by another workman or by a stranger in attempted robbery of the employer's premises, compensation should be allowed.

A border-line case, however, arose in Massachusetts and compensation was denied. In this case a night watchman was shot by mistake by officers pursuing burglars who had committed robbery in the neighborhood and were being pursued. There was no suggestion that robbery of the premises claimant was guarding was feared, and he was not fired upon because of his employment, but clearly through mistake. The court held that the injury did not arise out of the employment.

The Supreme Court of New Jersey also refused compensation in the case of a delivery man and collector who was shot by an unknown person for an unknown cause while in the performance of his duties. There was no attempt at robbery, though claimant had money on his person, and it was held that the shooting was not in any way connected with the employment.

We had a rather unsual case in Ontario about a year ago which is also close to the border line, but our board allowed the claim. A night watchman was found dead in the morning, sitting in a chair in the office of his employer, shot through the head, apparently by his own gun. There was nothing which would warrant the conclusion that it was a case of suicide, but on the contrary it seemed probable that he had been engaged in cleaning the gun, though there was no positive evidence as to this. It was a case in which the board was obliged either to infer suicide or accidental discharge of the gun while cleaning it, and the latter inference seemed the proper one.

It is equally well settled, I think, that where the assault which results in the injury arises out of a dispute or quarrel purely personal to the workman and not associated with his employment, compensation should not be allowed.

The distinction may be thus illustrated: Where a foreman is assaulted and injured while trying to compel a discharged workman to leave the place of his former employment, I think that the claim should be allowed. This was an actual case in California. On the other hand, and this is a case from our own Province, a street-car conductor in resenting what he considered a personal insult directed at him by a soldier passenger abused the soldier rather badly. The latter, upon going to his camp nearby, reported the affair to his soldier companions, whereupon a number of them returned, boarded this conductor's car as it was returning and beat him up, causing severe personal injury. We held that this was a purely personal quarrel and that the injury thus sustained did not arise out of the employment.

In another case which came before us, two workmen got into a dispute over some material or tools required in connection with their work and, words finally leading to blows, one of them was quite seriously injured. This one appeared to be the least to blame of the two, yet he did actively participate in the scrap. We held that the dispute was a purely personal one between these two men, and as the interests of the employer were in no way involved or concerned the injuries could not be said to have arisen out of the employment.

We also rejected a claim in a case where a boy was found dead at his place of work with a loop of rope around his neck, as the circumstances pointed to suicide rather than accident.

INJURIES DUE TO FROSTBITE OR HEAT STROKE.

The cases coming under this heading turn upon the same consideration as the lightning and bombardment cases above noted, viz, the question of special exposure.

In the Warner *v.* Couchman case, decided by the House of Lords in England in 1911, a baker whose duty was to drive a bread-delivery cart was frost bitten in the hand. The county court judge held that there was nothing in the employment which exposed him to more than the ordinary risk of cold to which every person working in the open air was exposed on that day, and consequently the injury did not arise out of the employment. The House of Lords held that the decision of the county court judge on this question of fact was final.

Important dicta by one of the appeal court judges, however, are quoted in the House of Lords with favor as expressing the point of view with which he says judges should approach cases of this kind:

> Where we deal with natural causes affecting a considerable area, such as severe weather, we are bound to consider whether the accident arose out of the employment or was merely a consequence of the severity of the weather to which persons in the locality, whether so employed or not, were equally exposed. If it is the latter, it does not arise out of the employment because the man is not specially affected by the severity of the weather by reason of his employment.

In the case of Dennis *v.* White, above referred to, which reversed the old line of decisions in regard to street accidents, Lord Chancellor Finlay, in referring to frostbite and sunstroke cases as distinguished from ordinary street accidents, says:

> In such cases it is material to show that the work involves special exposure to the heat or cold. Where the risk is one shared by all men, whether in or out of the employment, in order to show that the accident arose out of the employment, it must be established that special exposure to it is involved.

In regard to heat stroke, there are two English authorities in which the principles governing these cases were fully considered—one in the House of Lords in 1908 (The Ismay *v.* Williamson case) and the other in the court of appeal in 1914 (Maskery *v.* Lancashire). These were both shipping cases. In the one a stoker was overcome with heat while trimming the fires and in the other a young man not in the best of health who had shipped as an engineer on a vessel bound for Singapore, while sailing in the southern part of the Red Sea, was overcome by heat and died.

In both cases the court held that death was due to accident arising out of the employment, and it did not affect the situation to say that the man was not robust enough to stand the tropical heat. It was sufficient to find that the work in the engine room or boiler room exposed the workman to excessive heat, which was far greater than that to which ordinary sailors whose duty does not take them into the engine room were subjected.

We had a case of frostbite in Ontario last winter which the board allowed. A railway workman was sent out with an auxiliary crew to clear a wreck—weather 30° below zero. He was put at the job of flagging and was so engaged three or four hours, with the result that his legs and feet were very badly frozen. Under these circumstances it was considered accidental injury arising out of the employment.

ACCIDENTS OCCURRING DURING MOMENTS OF LEISURE OR WHILE DOING SOMETHING OF A PERSONAL NATURE.

Cases coming under this heading are very numerous and their decision must necessarily turn on the particular circumstances in each case. In England, as well as in all the jurisdictions on this side whose reports I have had the opportunity of reading, there is quite a latitude allowed workmen in respect to moments of leisure during the course of employment. The crew of a train, for example, waiting at a switch to make a crossing; a sailor in a river boat waiting for the tide; a machine operator waiting for material which he is dependent on another workman to bring to him; a trainman having a few hours between arrival at terminal and departure on return journey—one can easily imagine a variety of cases of this type, where the workman is clearly in the course of his employment but for the time being has no duties to perform for the employer.

To quote Milton: "They also serve who only stand and wait."

The question to be asked in every such case is, Did the workman occupy those moments of leisure reasonably, having regard to all the circumstances?

If, during such an interval of waiting, he meets with an accident while engaged in some occupation or amusement which is unconnected with his employment, or which adds to the risk to which he would otherwise be subject, judges in the main agree that compensation should not be allowed; but what one may reasonably do, of a personal nature and which is not in conflict with specific instructions, should not be held as taking a man outside the scope of his employment for purposes of compensation in the event of accident while so occupied.

The following decisions are noted in this connection: The New Jersey Supreme Court allowed a claim where a workman was killed while crossing railway tracks near the place of his employment to the toilet in common use by workmen in the employer's service. The Supreme Court of Massachusetts held that a compositor who went out on the roof on a hot night for fresh air and was injured by making a misstep was entitled to compensation. The California commission went so far as to hold that a cook was entitled to compensation, where he left the kitchen to smoke for a time on the adjoining porch, and on attempting to return opened the wrong door and fell downstairs.

There is one decision, however, reported from Iowa, which I think is carrying this idea of personal liberty at the expense of the employer too far. In that case a workman was allowed compensation who undertook to light his pipe while his hands were moist with gasoline, with which he had been cleaning his clothing.

We have had a variety of these personal and leisure-moment cases before our board, quite a number of them arising out of accidents occurring to workmen while remaining on the employer's premises during the luncheon hour.

I note among them the following:

Allowed—

Where a woman worker boiled water for tea on a gas jet near her work and it boiled over or was knocked over causing injury.

Where a boy, 14, working in a planing mill, being desirous of fixing up a small block of wood for his own use, took it to a saw to cut it to the desired shape and got his thumb cut off.

Where a scavenger, working for city, found two electric bulbs in garbage and out of curiosity cracked them together and lost an eye.

Where a section man, who had gone into city on his speeder to get his pay check, was found dead on the track, evidently run down by train on way home.

Where a workman being dusted off by another workman, by means of air hose, gets an internal charge and dies of peritonitis.

Where a workman paid 50 cents a week extra to engage in fire drill for the employers' voluntary fire department was injured while so drilling.

Where a boy employed on a vessel having some leisure time, while the vessel is tied up at a certain wharf, in chasing a rat which appears on the wharf, trips into the water and is drowned.

Where a laborer engaged in certain building work went into the shop or tool house to take shelter from a storm, and while there undertook to sharpen a fellow workman's chisel. When done, went to turn off switch, and was electrocuted.

Where a man on quitting work went to boiler for a pail of water with which to wash, slipped, and scalded himself.

Where a man in a mill having a moment of leisure went to another part of the plant to pay a small board bill to a fellow workman [and was injured].

Not allowed—

Where a man, seeing an adjoining machine idle and being curious to know how it works, attempted to operate it and got his thumb cut off.

Where a workman sleeping at noon hour on employer's premises, took a fit and rolled against a hot steam pipe.

Where a boy went out of his way to grind his jack knife on a machine where he had no business to be and was injured.

Where a man working on repairs on a ship, whose living quarters were on the ship, left his boat in the evening to spend the evening visiting his brother on another vessel alongside, owned by the same company, and was injured while leaving this other vessel late at night.

Where a workman taking a bath on employer's premises (a cordite factory) fell against hot pipes. It was alleged that it was necessary to take a bath every day in this work to keep in condition. Considered personal business.

Where a workman brought a bottle of ginger ale as part of his lunch and in opening it the stopper flew up and hit him in the eye.

Where a young man, after eating his lunch on the premises, climbed out on the roof of the building and, finding himself slipping, grabbed a wire within his reach. This sagged with his weight, and then he grabbed another, thus creating a circuit, and he was electrocuted.

CAMP ACCIDENTS.

Owing to the extensive lumbering and mining operations carried on in our Province, we are frequently called upon to deal with claims coming under this heading.

I refer especially to such as may happen to a workman after working hours. It is well understood, of course, that in most of these operations the men spend the whole of the 24 hours on what may be termed the employer's premises.

Practically the same principle is involved in this type of case as in the noon-hour accident cases above noted.

We allowed the claim of one man in a river driving camp who after supper went to his tent; while lying on his blanket on the floor reading, another workman came in and accidentally stepped on claimant's hand, inflicting a wound which became septic, with quite serious results. We considered that the accident, properly speaking, arose out of the employment.

We allowed another claim where a workman in walking from the dining camp to the sleeping camp slipped on the ice and broke his leg; also another claim where a workman slipped on the steps of the cook house, where large building operations were going on for an aviation camp.

In a border-line case, the claim was allowed where a workman was hired to go to work on a boat next morning. He actually came on board that night and slept on the boat, but was badly hurt next morning before his duties actually began.

On the other hand, where a workman was injured by slipping on an icy path leading from the works to his own house, which was on employer's premises, claim was disallowed.

It follows, of course, that workmen injured on the employer's roads leading from the woods to the camp are considered in the course of their employment, and in a few cases claims have been allowed for accidental injuries under such circumstances.

The California commission allowed a claim where a workman was injured by falling from a log on the road while coming with others into camp from the woods, but the decision seems to have been put on the ground in that case that these men were allowed time to return to camp from their place of work.

WEDNESDAY, SEPTEMBER 25—MORNING SESSION.

CHAIRMAN, FRED M. WILCOX, WISCONSIN.

BUSINESS MEETING.

REPORT OF THE SECRETARY-TREASURER.

At the Columbus meeting of the International Association of Industrial Accident Boards and Commissions, held in April, 1916, I offered to bring out the proceedings of the conference as a bulletin of the United States Bureau of Labor Statistics, if the association so desired. The advantages of having the proceedings published and distributed free of charge by the Bureau of Labor Statistics were obvious and the offer was accepted by the association. At the same meeting, I, as United States Commissioner of Labor Statistics, was chosen secretary-treasurer of the International Association of Industrial Accident Boards and Commissions because of the great advantage of having the publishing and distribution of the proceedings in the hands of the secretary and because, by vesting this office in the United States Commissioner of Labor Statistics, the association secured the benefits not only of publication free of expense, but of a central national secretariat possessed of great resources for acquiring information useful to the accident boards and compensation commissions and of the right to disseminate such information under the United States Government frank. The reasons for placing the secretaryship in the Bureau of Labor Statistics seemed to me sound at that time and I think the changing of conditions has brought out more strongly the indispensableness of having the office of secretary of the International Association of Industrial Accident Boards and Commissions located in Washington and vested with all the rights, powers, and prestige of a Federal bureau.

I accepted the secretaryship of this association only because of the great importance of improving legislation and administration in this comparatively new field of labor legislation relating to the rights of workers to compensation for injuries due to industrial hazards. I feel that the association has been very greatly strengthened and benefited by this arrangement, in spite of the fact that my time has been more than occupied with duties more directly connected with administering my Bureau, which obliged me to give but scant attention to the affairs of the association. The International Association of Industrial Accident Boards and Commissions has,

however, secured the services of a trained, experienced editorial staff free of expense. It has secured the publication and distribution of its proceedings without cost. The Bureau of Labor Statistics, through its MONTHLY LABOR REVIEW, has put at the disposal of the accident boards and compensation commissions a vast deal of information which should be of the greatest practical utility to them. In addition, many hundreds of letters have been written in answer to specific inquiries or to keep the boards and commissions informed of interesting and important matters. All these services rendered to the assocation constitute such additional burdens upon me, my secretary, and the editorial staff in the Bureau of Labor Statistics that some new arrangement must be made for the future.

Some criticism was voiced at the Boston meeting because of the lateness in the appearance of the proceedings of the Columbus conference. As I explained at Boston, the papers and transcripts of the Columbus meeting were not received by me until five months after the meeting was held. When they did reach me they were in such inexcusably bad shape that it required endless correspondence and months of labor on the part of the Bureau's editors to put the proceedings in printable form. By contrast, the proceedings of the Social Insurance Conference, held in Washington, D. C., December 5 to 9, 1916, which were reported by stenographers of my own staff, were sent to the Government Printing Office January 9, 1917, one month after the close of the conference, while the proceedings of the Columbus conference, held in April preceding the Social Insurance Conference, were sent to the Government Printing Office October 30, 1916, six months after the meeting. The difference in the time between the dates of meeting and the dates of sending the bulletins to the printer represents the difference between good reporting and bad reporting. Only one speaker at the Social Insurance Conference failed to get his remarks to me in time to be included in the proceedings. This delinquent was a noted surgeon. It has been my experience that physicians and surgeons are the most notorious malingerers and procrastinators to be found anywhere. If they have no better sense of time value in the practice of their profession than they evidence in meeting their obligations in the matter of writing and correcting their addresses on medical and surgical subjects, their unfortunate patients have my profoundest sympathy.

No doubt the members of the association marvel that the proceedings of the Boston meeting have not yet appeared. The reasons for the delay in bringing out the proceedings of the Columbus meeting apply in the present case, but the circumstances are even more aggravating and are utterly inexcusable. Despite every effort on my part, no papers have ever been received from Dr. J. W. Brick-

ley, Dr. Timothy Leary, F. M. Wilcox, and F. J. Donahue. After using up an amount of time, stenographic skill, typewriter ribbon, paper, and ink all out of proportion to the value of the results achieved, I did get, on April 4, 1918, papers from Dr. F. D. Donoghue, Dr. J. W. Sever, Dr. E. E. Southard, and Dr. A. W. George. By that time the congestion at the Government Printing Office had become so great that it was utterly hopeless to get anything printed this year except the most urgent war emergency matter. Some of the speakers did not take enough interest even in their own remarks to give the courtesy of a reply to my urgent appeals for their papers. It is quite evident that the papers can't be published unless they are written and sent in.

I had almost as great trouble in getting most of the stenographic transcripts of discussions. After months of delay, during which time the stenographers apparently completely forgot the meaning of their notes, if they ever meant anything at all, I received jumbled masses of more or less meaningless words. The strain upon the patience and nerves of the editors, to say nothing of the time involved in dealing with such reportorial inefficiency, is awful. In the end, I was obliged to cut out most of the stenographic reports of the alleged sayings of speakers. In doing so I felt obliged to sacrifice some good material.

I can better picture to you the seriousness of this matter by an illustration. Those of you who were present at the luncheon served in the West Lynn plant of the General Electric Co. will remember with pleasure the spontaneous discussion which followed. You will recall that Dr. F. E. Schubmehl started things by condemning the free choice of physician by the injured workers. Dr. Rubinow attacked this position and there followed a most animated and highly profitable discussion. The stenographer who took this discussion for some reason credited Dr. Rubinow with only a brief paragraph and Dr. Schubmehl with even less. The remarks of another speaker who did not contribute anything noteworthy were for some reason reported in extenso. The stenographic report of this vitally important discussion was thus so misleading that I deemed it best to cut out practically all of it.

In many instances the remarks ascribed to speakers were confused or meaningless and had to be eliminated. I make extended reference to the unsatisfactory reporting of discussions not merely to explain difficulties and delays in publishing but chiefly to urge the need for adequate reporting if discussions are to be printed at all. I may add that a good deal of discussion is not worth publishing. Perhaps no further comment on this score is necessary. However, I can not refrain from again saying that the proceedings of the meet-

ings can not be brought out promptly and in useful form unless speakers and writers cooperate by sending in papers and corrected manuscripts and proofs promptly to the one charged with the task of editing and publishing the proceedings. If the meetings are worth while they are worth reporting correctly and publishing promptly and in usable form. If they are not worth while, let us discontinue them and dissolve the organization.

Regarding this Fifth Annual Meeting of the International Association of Industrial Accident Boards and Commissions, it was my intention to have all the papers printed and distributed in advance of the meeting. The overwhelming pressure of emergency war work, coupled with the setting forward of the date of the meeting by two weeks, has made it impossible to carry out my intentions fully. It is encouraging that up to September 9, 18 papers out of the 37 provided for on the program had been received by me. It is not so encouraging when we consider that I had asked that papers, together with summaries, be submitted not later than August 15. Only 6 of the writers had prepared summaries or synopses of their papers as requested. The 12 papers without summaries had to be gone through carefully and summarized by the editors of my Bureau. The summaries were mimeographed and sent out on the 9th and 10th of September. No doubt some of the authors whose papers have been summarized by the editors in the Bureau of Labor Statistics will feel dissatisfied with the summaries. Of course, it would have been much more satisfactory if the papers could have been printed in full before the meeting. A summary by the author is the next best thing when the complete paper is not available. One reason for asking the authors of papers to submit summaries was to enable us to take care of the papers by mimeographing the summaries in case it should prove impossible for any reason to get the complete papers printed in advance.

Coming now to a question of even more immediate moment, I do not see how the Bureau of Labor Statistics can publish the proceedings of this present meeting. The appropriation for printing and binding allotted to the Bureau has been cut from $76,000 to $35,000—a sum which is inadequate to pay for the printing of the MONTHLY LABOR REVIEW alone for a year. Even if my printing funds were made sufficient and the papers and stenographic reports came in promptly and in perfect shape for printing, it would still be very difficult to manage the publication because of the overwhelming pressure of work falling upon my Bureau and the congestion in the Government Printing Office. It has been proposed in Congress that all "nonessential" printing be eliminated. We are all heartily in favor of that plan, but our classification of nonessential printing

would probably not coincide with that of Congress. In view of these facts it seems necessary that the association consider seriously whether it is not possible to make some other arrangements for publication of the complete proceedings. A summarization of the proceedings will, of course, appear in the November number of the MONTHLY LABOR REVIEW. If it shall be found impossible to provide for the publication of the proceedings more surely and more speedily than appears possible through the Bureau of Labor Statistics, I shall of course use every effort to get them out. The situation is so uncertain, however, that I desire to call the attention of the delegates to the probable delay and even the possibility that the Bureau of Labor Statistics can get nothing published for the association. I wish it distinctly understood that the Bureau of Labor Statistics will continue to send out useful information to all accident boards and compensation commissions throughout the United States and Canada, both through the columns of the MONTHLY LABOR REVIEW and by letter. To make my Bureau as useful as possible to the members of this association and to labor officials generally, the boards and commissions must inform the Bureau of Labor Statistics promptly of any interesting and important developments in compensation legislation and administration.

The treasurer's report on the finances of the International Association of Industrial Accident Boards and Commissions shows that it is not yet a solvent organization, although the membership dues were doubled last year and the active paying memberships have increased from 24 to 28—more than 16 per cent.

The 28 active paying members are:

The Industrial Accident Commission of California.

The Workmen's Compensation Commission of Connecticut.

The Industrial Accident Boards of Hawaii (counties of Kauai, Maui, Hawaii, and Honolulu).

The Workmen's Compensation Service of Iowa.

The Industrial Commission of Illinois.

The Industrial Accident Commission of Maryland.

Industrial Accident Board of Massachusetts.

State Board of Labor and Industries of Massachusetts.

Industrial Accident Board of Michigan.

Department of Labor and Industries of Minnesota.

Industrial Accident Board of Montana.

Department of Labor of New Jersey.

New York State Industrial Commission.

Industrial Commission of Ohio.

Industrial Commission of Oklahoma.

Industrial Accident Commission of Oregon.

Department of Labor and Industry of Pennsylvania.
Industrial Accident Board of Texas.
Industrial Commission of Utah.
Industrial Insurance Department of Washington.
State Compensation Commissioner of West Virginia.
Industrial Commission of Wisconsin.
Workmen's Compensation Department of Wyoming.
Workmen's Compensation Board of British Columbia.
Workmen's Compensation Board of Manitoba.
Workmen's Compensation Board of Nova Scotia.
Workmen's Compensation Board of Ontario.
Department of Public Works and Labor of Quebec.

The dues of the 11 following active paying members, however, have not yet been received for the fiscal year ending June 30, 1919:

The Industrial Commission of Illinois.
State Board of Labor and Industries of Massachusetts.
Industrial Accident Board of Michigan.
Department of Labor and Industries of Minnesota.
Industrial Accident Board of Montana.
New York State Industrial Commission.
Industrial Commission of Oklahoma.
Industrial Accident Board of Texas.
State Compensation Commissioner of West Virginia.
Workmen's Compensation Board of British Columbia.
Workmen's Compensation Board of Ontario.

You will recall that the United States Employees' Compensation Commission, the United States Bureau of Labor Statistics, and the Department of Labor of Canada, while entitled to vote as active members, are exempt from the payment of dues.

It will be noted that two Massachusetts boards belong to the association, namely, the State Industrial Accident Board and the State Board of Labor and Industries. Both these agencies are, of course, interested in the purposes of our organization. This adds point to my suggestion for the amalgamation of the International Association of Industrial Accident Boards and Commissions and the Association of Governmental Labor Officials of the United States and Canada.

We also have four associate members paying $10 each. These members are:

Mr. William P. White, treasurer and general manager of the Lowell Paper Tube Corporation, Lowell, Mass.

National Workmen's Compensation Service Bureau, New York, N. Y.

Mr. John T. Clarkson, general counsel, law department, United Mine Workers, District No. 13, Albia, Iowa.

Workmen's Relief Commission of Porto Rico.

The last-named associate member has just joined the organization and the annual dues have not yet been received.

It is very difficult to obtain the appropriations from State legislatures to pay the dues. The difficulty is greatly increased by the fact that another organization exists, claiming jurisdiction over all matters pertaining to labor, including the administration of compensation laws. I refer, of course, to the Association of Governmental Labor Officials of the United States and Canada. A State legislature would be justified in thinking that there is no good reason for the separate existence of these two organizations. The election of the chairman of the Industrial Commission of Wisconsin as the president of the Association of Governmental Labor Officials of the United States and Canada marks a new epoch in the history of that association and gives promise that the association will become, as it should be, a most useful organization for the standardization and improvement of labor administration and labor legislation. Because the Association of Governmental Labor Officials gives evidence of better things and because the International Association of Industrial Accident Boards and Commissions has become pretty firmly established, it seems to me the time is ripe for an amalgamation of these two organizations. In Wisconsin, Ohio, and New York the industrial commissions are charged with the administration of all labor laws, including workmen's compensation laws. In all States it is vital to bring the administrators of the compensation laws and the people generally to see the connection between preventing injuries and paying compensation for them. The amalgamation should make it easier to get the State legislatures to make appropriations for the support of the amalgamated organization; it would cut down travel and other expenses and eliminate much loss of time and bother by substituting one meeting for two; it would unify more closely the labor-enforcing agencies in those States not having industrial commissions. The only possible disadvantage that I can see is that the more backward States might gain control of the organization. Presumably the compensation States are more progressive than the noncompensation States. Some may argue that amalgamation should not be considered until all States have compensation laws. There are 38 States, two Territories, and seven Provinces of Canada with compensation laws, as against 10 States, the District of Columbia, and four Provinces of Canada without compensation laws. The argument then has little weight.

It would be necessary, of course, to have separate sessions devoted to the discussion of special compensation problems, including statistics of accidents for compensation purposes, medical, surgical, and

hospital treatment, the retraining of injured workers and their reemployment in suitable occupations, as well as the problems concerned with the hearing of compensation cases and the granting and handling of compensation awards.

After the rather frank manner in which I have discussed the delinquencies of conference speakers, coupled with my statement regarding the printing fund of the Bureau of Labor Statistics, it is perhaps superfluous for me to announce that I am not a candidate for reelection as secretary-treasurer. I have been obliged to let many things go undone which should have been attended to in the interests of the association and its several members, because of many other duties which could not be neglected or postponed. If the International Association of Industrial Accident Boards and Commissions and the Association of Governmental Labor Officials of the United States and Canada are amalgamated, as I have suggested, a secretary-treasurer is needed who can give not less than half his time to the affairs of the amalgamated association. It does not seem possible that the association will be immediately able to maintain a paid secretary with the necessary office force and pay for the publication of its proceedings as well. The proceedings of the Columbus meeting (Bulletin 210), consisting of 252 pages, cost the Bureau of Labor Statistics a little over $1,700. This charge covered only the cost of composition and paper and did not pay for the large amount of editorial and clerical work required to bring out the bulletin. The same bulletin would now cost at least 20 per cent more, because of the increase in prices and wages. The association should face the situation and now decide whether steps should be taken to establish a central office, financed by funds to be collected from members, or whether it will continue to depend upon the rather inadequate services and dilatory and uncertain publication facilities offered by the Bureau of Labor Statistics.

I submit an estimated budget for your consideration in case you should decide that the former course is advisable.

Budget for Amalgamated Association.

For secretary to association, including stenographic and clerical work	$2,500
Stationery	75
For postage	250
For telegrams	50
Printing of programs for annual meeting	50
Miscellaneous expenses connected with annual meeting	100
For reporting proceedings	400
For printing proceedings	3,000
	6,425

FINANCIAL STATEMENT.

RECEIPTS.

1917.			
Aug.	21.	Balance on hand, including postage and telegraph fund of $3.48	$371.09
	21.	For membership dues, 1917–18, Compensation Board of Manitoba	50.00
	21.	From sales at Boston meeting of the report of discussion before the British Royal Society of Medicine on toxic jaundice observed in munition workers	11.00
	21.	From John T. Clarkson, legal department, United Mine Workers of America, District 13, Albia, Iowa, associate membership dues, 1917–18	10.00
Sept.	29.	From William P. White, of the Lowell Paper Tube Corporation, associate membership dues, 1917–18	10.00
Oct.	4.	From New York State Industrial Commission for five copies of the report of the discussion before the British Royal Society of Medicine on toxic jaundice observed in munition workers	5.00
	6.	From Mr. Albert W. Whitney, for associate membership dues, 1917–18, of the National Workmen's Compensation Service Bureau	10.00
	6.	Membership dues for the fiscal year ending June 30, 1919—Workmen's Compensation Board of Connecticut	50.00
Nov.	15.	From the Illinois Department of Labor for three copies of the report of the discussion before the British Royal Society of Medicine on toxic jaundice observed in munition workers	3.00
1918.			
Jan.	1.	Interest on bank deposit	3.60
		Membership dues for the fiscal year ending June 30, 1919:	
Apr.	16.	Massachusetts Industrial Accident Board	50.00
	17.	Maryland Industrial Accident Commission	50.00
	23.	Department of Public Works and Labor, Province of Quebec	50.00
May	15.	Washington Industrial Insurance Department	50.00
	25.	Workmen's Compensation Department of Wyoming	50.00
June	17.	Workmen's Compensation Service of Iowa	50.00
	24.	Workmen's Compensation Boards of Hawaii (counties of Kauai, Maui, Hawaii, and Honolulu)	50.00
July	1.	Interest on bank deposits	3.92
		Membership dues for the fiscal year ending June 30, 1919:	
	8.	Compensation Board of Manitoba	50.00
	26.	Workmen's Compensation Board of Nova Scotia	50.00
Aug.	3.	Industrial Commission of Utah	50.00
	17.	Wisconsin Industrial Commission	50.00
	21.	Industrial Commission of Ohio	50.00
	28.	California Industrial Accident Commission	50.00
	28.	Oregon Industrial Accident Commission	50.00
	29.	Pennsylvania Department of Labor	50.00
		Total	1,277.61

DISBURSEMENTS.

1917.		
Aug. 21.	Postage and telegraph fund (balance on hand)	$3.48
27.	To Bay State Railway Co. (special car to Lynn, Mass., to see General Electric Co. plant) check to Dudley M. Holman	16.40
29.	To Dr. Cora B. Gross, for services as registrar, fourth annual meeting, Boston	12.00
29.	To Dudley M. Holman, conference expenses: Postage, $2.75; signs and messenger, $2; typewriting, $2.25; messengers, 75 cents; telephone calls, $1.50; telegrams, $1.56; luncheon and suppers, Boy Scouts, $3.50	14.31
29.	Reporting meeting, August 21	20.00
Sept. 7.	To Robert Miller & Co. (hiring of flags and draping same, fourth annual meeting, Boston)	5.00
26.	To Charles G. Stott (Inc.), 10,000 sheets of mimeographed paper	14.40
Dec. 12.	For transcripts of stenographic reports, fourth annual meeting, Boston	35.50
12	For transcript of stenographic report, fourth annual meeting, Boston	3.50
12.	For transcript of stenographic report, fourth annual meeting, Boston	3.85
1918.		
Jan. 7.	To Gibson Bros. (Inc.), for letterheads, envelopes, second sheets (alterations in letterheads)	30.00
Mar. 11.	For transcripts of stenographic reports, fourth annual meeting, Boston	27.32
18.	For postage and telegraph fund	5.00
23.	For postage and telegraph fund	10.00
Aug. 24.	For postage and telegraph fund	10.00
Sept. 16.	For printing programs, and alterations	20.50
17.	Cash on hand	1,046.35
	Total	1,277.61

There is a postage fund balance amounting to $9.84.

When the accounts of the International Association of Industrial Accident Boards and Commissions were first turned over to me as secretary-treasurer of the organization there was some confusion not only as to the membership of the organization but also as to when the dues should be paid. Last March it was found, after much inquiry, that of all the boards and commissions belonging to the association only six had paid any dues since January, 1917, the majority of these being new members. It was, therefore, thought both inadvisable and impracticable to attempt to collect dues for 1917–18, when the new constitution provided that the dues for the fiscal year ending June 30, 1919, should be paid between July 1, 1918, and the annual meeting this fall. Such attempt would have meant that every delinquent industrial accident board and commission would have had to be requested to pay dues for two years between last April and the annual meeting this fall. Moreover, the amount of dues was increased by the new constitution from $25 to $50 and, previous to the adoption of the constitution, there was nothing to indicate when the fiscal year of the association began. In view of these conditions and also of the fact that there were enough funds in the treasury to carry the organization up to

June 30, 1918, it was decided that all dues paid after the last annual meeting should be credited to the fiscal year ending June 30, 1919.

It will be noted that the Province of Manitoba paid dues on August 21, 1917, for the fiscal year 1917–18, and on July 8, 1918, for the fiscal year ending June 30, 1919. As the compensation board of Manitoba is the only active member that has paid dues twice since the opening of the last annual meeting (Aug. 21, 1917), it is recommended that dues paid by such board on July 8, 1918, be credited to the fiscal year ending June 30, 1920.

Vouchers for annual dues have been received from both the New York State Industrial Commission and the New Jersey Department of Labor, but payment has not yet been made.

It is highly desirable that dues be paid at least a month in advance of the annual meeting, so that a complete statement of the financial condition of the association may be embodied in the treasurer's annual report to such meeting.

Of the 50 copies of the report of the discussion before the British Royal Society of Medicine on toxic jaundice observed in munition workers, which were purchased in June, 1917, 26 have been sold.

Respectfully submitted.

ROYAL MEEKER, *Secretary-Treasurer.*

REPORTS OF COMMITTEES.

The committee on jurisdictional conflicts reported progress and was continued.

The committee on statistics and compensation insurance cost submitted its report which was adopted. The executive committee was authorized to cooperate with the Federal Bureau of Standards in the formulation of a uniform safety code; also to study the question of uniformity in State compensation laws. Following is the full report of the committee on statistics and compensation insurance cost:

REPORT OF COMMITTEE ON STATISTICS AND COMPENSATION INSURANCE COST.

At the annual meeting of this association at Columbus in April, 1916, your committee submitted standard classifications of industries and accident causes and of industrial injuries by location and nature of injury and extent of disability. The committee's recommendations on these subjects were adopted by the association and are gradually being put into use by the various State boards and commissions. It is believed that a foundation has thus been laid for uniform statistics of industrial accidents. This report of the committee has been printed in full in Bulletin 201 of the United States Bureau of Labor Statistics.

At the last annual meeting of the association at Boston, in August, 1917, your committee submitted standard definitions for industrial accident uses, a standard scale of weights designed to express the severity of accidents in terms of days lost, and standard tables for the presentation of accident and compensation statistics. This report was also adopted by the association and was printed in the October, 1917, issue of the MONTHLY REVIEW of the United States Bureau of Labor Statistics.

During the past year your committee, continuing its work, has held two meetings, these meetings occupying some 10 sessions covering four days. The

revision of the classification of accident causes has been the committee's chief work during these meetings. During the two years since the original cause classification was published by the committee it has been in use by all the members of the committee and by others. Naturally, this practical experience had given rise to suggestions for changes and additions to the classifications. Furthermore, experience had shown the need of some agreed-upon rules of practice, in order that variations in interpretation of the causes might not develop so as to render results not fairly comparable and, therefore, seriously impair their usefulness. The committee believes that this experience has enabled it to improve greatly the cause classification, and it submits this classification as now revised, with its accompanying notes, with confidence that it represents a marked improvement on any cause classification hitherto published.

The committee in its meetings during the year has also made some minor revision of the classifications of accident by location and nature of injury and extent of disability. The revision of these classifications has, however, been in minor details, not in any way affecting the broad outline as published in Bulletin 201.

The committee has given some consideration to a revision of the industry classification, but any extended revision of this classification is so formidable a task that the committee has, thus far, made only slight progress in that work. The revision of this classification has been attempted by an informal committee, made up of several members of your committee and representatives of the National Workmen's Compensation Service Bureau and others. This informal committee has held several meetings and has practically completed a revision of the industry classification, which it is expected will be submitted at a later date, for the consideration of the committee on statistics. It has been the plan of your committee that this work should be taken up at its next meeting.

At the last meeting of the committee it discussed with Frederick L. Hoffman, chairman of the committee on statistics of the National Safety Council, the question of the standardizing of the methods used by individual establishments for recording, classifying, and analyzing accidents to employees. It was agreed that some standard forms and methods should be worked out, if practicable, so that results may be properly tabulated and comparisons, statistically valid, may be made. It was agreed with Mr. Hoffman that the whole matter should be the subject of conference with his committee at a future meeting. It is understood that Dr. Hoffman's committee is recommending for adoption by the National Safety Council the definitions and classifications of your committee.

As recommended in the report submitted last year, it is believed that the work of this committee should be continuous. Experience in the several States is constantly disclosing the need of interchange of views and experience and of the discussions which are only possible in meetings of such a committee. Progress in the standardization of accident and compensation statistics will be necessarily somewhat slow, but the need, which was evident when the committee was organized, that statistical methods be standardized to facilitate comparisons and to aid the boards and commissions in administrative work becomes more and more pressing with the extension of workmen's compensation laws.

The revised classifications which the committee recommends for adoption follow.

CLASSIFICATION OF ACCIDENT CAUSES.

GENERAL CAUSE CLASSIFICATION.

I. Machinery.
II. Vehicles (not including construction of).
III. Explosions, electricity, fires, and hot substances.
IV. Poisonous and corrosive substances and occupational diseases.
V. Falls of persons.
VI. Stepping on or striking against objects.
VII. Falling objects—not being handled by injured.
VIII. Handling of objects.
IX. Hand tools.
X. Animals.
XI. Miscellaneous causes.

I. MACHINERY.

A. Prime Movers.

1. Steam engines.
2. Gas or gasoline engines.

NOTE.—Include all internal-combustion engines.

3. Electric motors and dynamos.
4. Compressed-air motors.
5. Water motors.
6. Other prime movers.

B. Power-Transmission Apparatus.

1. Shafts.
2. Shaft collars and couplings.
3. Set screws, keys, and bolts.
4. Belts and pulleys.
5. Chains and sprockets.
6. Ropes, cables, and drums.
7. Cogs, cams, gears, and friction wheels.

NOTE.—Accidents upon belts, pulleys, shafts, gears, or other driving mechanism or parts thereof which form the connection between a machine and the prime mover or intermediate drive shall be charged to transmission apparatus. This includes parts attached to the machine. Accidents upon belts, pulleys, shafts, gears, or other driving mechanism, or parts thereof which connect one part of the machine with another part of the same machine, shall be charged to the machine.

C. Power-Working Machinery.

NOTE.—The committee believes that power-working machines should be classified by industry, and that within each industry group the principal types of working machines should be grouped by operative hazard. The committee recommends the use of the list of working machines prepared by the Bureau of Statistics and Information of the New York Industrial Commission, in cooperation with the National Workmen's Service Bureau.

The list follows:

Power-working machines.

STONE, CLAY, AND GLASS PRODUCTS MACHINES.

030 Brick-making machinery (not otherwise classified).
031 Brick cut-off machines.
032 Dry pans.
033 Molding machines.
034 Pug mills.
040 Cement-making machinery (not otherwise classified).
Bag-filling machines (cross index, Barreling, etc., machines, under Food).
042 Cement-block machines.
043 Tube mills.
050 Glass-making machinery (not otherwise classified).
051 Polishing wheels.
052 Presses.
053 Surface grinding machines.
060 Pottery-making machinery.
080 Stone crushers.
090 Stone-working machinery other than crushers (not otherwise classified).
091 Drills.
Planers (cross index, Metal).
093 Saws.
094 Rubbing beds.

METAL-WORKING MACHINES.

100 All other metal-working machines.
105 Abrasive wheels (emery, etc.).
Bending and straightening machines (revolving rolls, screw or clamp).
106 Corrugating rolls.
107 Crimping rolls.
108 Other metal rolls.
109 Other bending and straightening machines (not rolls).
110 Bolt and nut, pipe-cutting, threading, and tapping machines.
111 Boring machines or mills (horizontal and vertical) (not otherwise classified.
115 Drills (drill presses), radial and upright or gooseneck.
Milling and gear-cutting machines (not otherwise classified).
119 Broaching machines.
120 Die sinkers.
121 Gear-cutting machines.
122 Key seaters.
123 Milling machines.
124 Profilers.
125 Slotters.
129 Other or indefinite.
Hammers and forging machines (not otherwise classified).
130 Belt machines.
132 Drop hammers.
133 Forging hammers.
134 Scrap breakers.
135 Swaging machines.
136 Upsetting machines (not otherwise classified).
139 Other or indefinite.

Lathes and automatic screw machines.
140 Lathes (not otherwise classified).
141 Screw machines.
142 Turret lathes.
145 Cleaning mills—tumblers or rumblers.
146 Molding machines (core, sand mixers, tamping, etc.) (not otherwise classified).
Planers and shapers.
151 Planers.
152 Shapers.
155 Polishers and buffers.
156 Portable power tools (pneumatic and electric drills, hammers and riveters).
Presses (power) (including punches).
157 Arbor presses.
158 Bulldozers.
159 Button presses.
160 Draw presses.
161 Embossing presses.
162 Punch, stamping, and trimming presses.
163 Punch and eyeletting machines.
164 Punches and riveting presses (not riveting hammers).
167 Other or indefinite.
168 Presses (foot and hand operated—no mechanical power) (not otherwise classified).
169 Button presses.
170 Rolling mills (including blooming mills).
171 Saws (not otherwise classified).
172 Band.
173 Circular.
174 Hack.
175 Scroll and jig.
176 Shears (not otherwise classified).
185 Welding and heat cutting machines.
186 Wire working machines (not otherwise classified).
190 Winding machines (armatures, etc.).
191 Cable-making machines (not otherwise classified).
195 Wire and tube drawing machines.
197 Presses—hydraulic, pneumatic, and screw.

WOODWORKING MACHINES.

200 All other woodworking machines (not otherwise classified).
205 Bending machines.
206 Boring machines and drills.
207 Cork working machines (not otherwise classified).
208 Band knife.
209 Cork board cutters, block cutters, etc.
210 Cork-slicing machines.
213 Lathes (not otherwise classified).
214 Spoke lathes.
215 Shoe last machines.
216 Button lathes (ivory, etc.).

220 Mortising machines (not otherwise classified).
221 Chain mortisers.
222 Chisel mortisers.
223 Pocket and boring machines.
225 Tenoning, planing and molding machines (not otherwise classified).
226 Auto. blind slat (tenoner).
227 Edgers.
228 Jointers.
229 Matchers.
230 Molders.
231 Planers.
232 Stickers.
234 Tenoning machines.
237 Presses (not otherwise classified).
238 Clamping machines.
239 Box nailers.
240 Box board squeezers.
241 Door and blind clamps.
242 Hoop presses.
245 Sanding machines (not otherwise classified).
246 Belt (felloe and panel).
247 Disk.
248 Spindle and post.
249 Surface or drum.
250 Saws (band, scroll, or jig) (not otherwise classified).
251 Band.
252 Band resaw.
253 Jig or scroll.
254 Saws (circular and all other) (not otherwise classified).
255 Circular.
256 Gaining machine.
257 Gang circular.
258 Lath bolter.
259 Swing.
260 Dado.
261 Dovetailing.
262 Rabbetting.
265 Shapers (including special head cutters) (not otherwise classified).
266 Core box machines.
267 Shapers.
268 Variety machines.
270 Veneering machine (all kinds) (not otherwise classified).
272 Veneer machines.
280 Brush and broom-making machines (all kinds).

LEATHER-WORKING MACHINES—TANNERIES.

300 All other.
301 Buffing drums.
302 Other drums and paddle vats.
303 Fur-working machines.
304 Fleshing, shaving, and skiving machines.
305 Jacks—felting, glassing, rolling, etc.
306 Presses and baling machines.
307 Hair washing and drying machines.

308 Setting up (or setting out) machines.
309 Splitting machines.
310 Unhairing machines.
311 Extractors (centrifugal).

LEATHER-WORKING MACHINES—LEATHER PRODUCTS.

320 All other.
330 Cutting machines (not otherwise classified).
340 Punching and pressing machines (not otherwise classified).
350 Sewing machines.
351 Buffing and scouring machines.
352 All other shoe-making machines.

PAPER-MAKING MACHINES.

360 All other.
365 Barkers, chippers, splitters, and grinders, indefinite.
366 Barkers.
367 Chippers.
368 Grinders.
369 Splitters.
370 Beaters (including rag washers).
371 Screens.
Paper machines.
372 Other or indefinite.
373 Head box.
374 Apron.
375 Wire.
376 Suction roll.
377 Couch roll.
378 Dryers.
379 Calenders.
380 Doctors.
381 Rolls and winders.
382 Cutters and slitters.
383 Choppers.
384 Digestors.

PAPER-PRODUCTS MACHINES.

386 All other (not otherwise classified).
387 Paper-cup machines.
388 Tube machines.
389 Twine-making machines.
390 Automatic box-making machines.
391 Covering machines.
392 Cutting and punching machines (not otherwise classified).
393 Die cutters.
394 Guillotines.
395 Paper cutters (hand).
396 Perforators.
397 Punches.
398 Rotary cutters.
399 Saws.
400 Shears.

401 Doming and ending machines (not otherwise classified).
402 Doming machines.
403 Corrugating machines (not rolls).
404 Ending machines.
406 Corner staying machines.
407 Bag and envelope making machines.
408 Paper finishing machines.
Embossing rolls or calendars (cross index, Rubber).
Embossing presses (cross index, Metal).

PRINTING AND BOOKBINDING MACHINES.

420 Composing machines (type casting and trimming machines) (not otherwise classified).
421 Linotypes.
422 Monotypes.
423 Type casters.
424 Gathering machines.
426 Presses (printing) (not otherwise classified).
427 Web newspaper presses.
428 Flat-bed cylinder presses.
429 Job platen presses.
430 Other printing presses.
431 Presses (binders) (not otherwise classified).
440 Sewing and stitching machines (not otherwise classified).
441 Wire stitchers.
442 Wire staplers.
445 Other printing machines.
450 Other bookbinding machines.

TEXTILE MACHINES.

460 All other (not otherwise classified).
461 Washers.
462 Driers.
469 Opening and cleaning machines (not otherwise classified).
470 Openers.
471 Pickers.
472 Rag pickers.
473 Willow.
475 Carding and combing machines (not otherwise classified).
476 Cards.
477 Combs.
478 Garnett machines.
479 Slubbers.
485 Spinning machines (not otherwise classified).
486 Jacks and mules.
487 Spinning frames.
489 Drawing frames.
490 Weaving machines (not otherwise classified).
491 Looms.
492 Wire-cloth looms.
493 Warpers.

500 Dyeing, finishing, and printing machines (not otherwise classified).
501 Pile-cutting machines.
502 Shearing machines.
510 Braiding and knitting machines.
515 Rope-making machines.
Sewing machines (cross index, Leather products).
520 Cloth cutting and stamping machines (not otherwise classified).
530 Hat-making machines.
540 Coating and inlaying machines (linoleum, etc.; other coated fabrics).
545 Winders, doublers, and quillers.

LAUNDRY MACHINES.

550 All other.
Extractors (cross index, Leather).
560 Ironing machines (not otherwise classified).
561 Body ironers.
562 Flat work ironers.
563 Mangles.
570 Washing machines (rotary).

FOOD PRODUCTS MACHINES.

580 All other.
585 Cleaning, preparing, and sorting machines (not otherwise classified).
595 Milling and grinding machines (not otherwise classified).
605 Mixing machines and mixing kettles (dough and chocolate mixers, etc.).
606 Dough mixers.
610 Cookers (not mixers) and ovens (not otherwise classified).
615 Shaping and forming machines (not otherwise classified).
620 Cutting machines (not otherwise classified).
625 Coating and polishing pans (not otherwise classified).
630 Calenders (candy rolls, etc.) (not otherwise classified).
635 Crushers (ice crushers, etc.)
636 Barreling, bagging, packing, and wrapping machines (automatic or semi-automatic).
640 Bottling machines.
645 Tobacco working machines.
Stamping presses—power-operated (cross index, Metal).
Stamping presses—foot or hand-operated (cross index, Metal).
655 Bleaching and blanching machines.
660 Containers' washing and cleaning machines.

FARM MACHINES.

670 All other.
671 Feed and ensilage cutting and shredding machines.
672 Harvesters.
673 Thrashers.
674 Hay presses and balers.
675 Shelling machines.
676 Cream separators.
677 Cotton gins.

ENGINEERING AND CONTRACTING MACHINES.

680 All other.
681 Concrete mixers.
682 Rock drills.

683 Pile drivers.
684 Road rollers.
685 Grouting machines and cement guns.
686 Well drills.
687 Trench and ditch digging machines.

CHEMICAL PRODUCTS MACHINES—ACIDS AND SALTS.

690 All other.
691 Grinding machines (except abrasive wheels).
692 Agitating mixers, vats, and kettles (except paint and pony mixers).
693 Machinery of recovery, such as screens, sifters, filters, and extractors, not centrifugal.
694 Furnaces, ovens, dryers, and evaporators, mechanically fed or operated.
Crushers (cross index, Stone crushers).
Calenders (cross index, Rubber).
Centrifugal extractors (cross index, Leather, tanneries).

CHEMICAL-PRODUCTS MACHINES—SOAPS, GREASES, OILS, AND FERTILIZERS.

700 All other.
Agitating mixers, vats, and kettles (except paint and pony mixers) (cross index, Acids).
Soap-stamping presses—power-operated (cross index, Power presses, under Metal).
Soap-stamping presses—hand and foot operated (cross index, Foot presses, under Metal).
Soap grinders (cross index, Grinding machines, under Acids).
Barreling, bagging, packing, and wrapping machines—automatic or semi-automatic (cross index, Food products).
Machinery of recovery, such as screens, sifters, filters, and extractors, not centrifugal (cross index, Acids).

CHEMICAL-PRODUCTS MACHINES—DRUGS.

705 All other.
Grinding machines (cross index, Acids).
Mixers (except pony mixers) (cross index, Acids).
Tablet presses and pill machines (cross index, Shaping machines, under Foot).
Pony mixers (cross index, Paint mixers).

PAINTS, VARNISHES, DRY COLORS, INKS, AND DYES.

710 All other.
Agitating vats and kettles (except paint or pony mixers) (cross index, Acids).
715 Pony or paint mixers.
Grinding machines (cross index, Acids).
Machinery of recovery, such as screens, sifters, filters, and extractors, not centrifugal (cross index, Acids).
Furnaces and ovens, mechanically fed or operated (cross index, Acids).
Crushers (cross index, Stone crushers).
Calenders (cross index, Rubber).
Centrifugal extractors (cross index, Leather, tanneries).

RUBBER, CELLULOID, COMPOSITION, PEARL, BONE, AND TORTOISE SHELL.

720 All others.
725 Calenders.
726 Tire and tube making machines.
727 Hose-making machines.
728 Rubber-band choppers and cutters.
Mixers, not of calender type (cross index, Pony mixers—paint).
Cutting and slitting machines (cross index, Paper making).
729 Tubing and hose-wrapping machines.
730 Tire-wrapping machines.
Tumblers (cross index, Cleaning mills, under Metal).
Presses—foot and hand operated (cross index, Metal).
731 Tubing machines.
Punching and pressing machines (press and dye type) (cross index, Leather products).
Cutting and punching machines (guillotine type) (cross index, Paper products).
732 Comb-cutting machines and ornament shapers.
733 Drills (button, etc.).
734 Grinding, washing, milling, and cracking machines.

MINING AND ORE-REFINING MACHINES.

735 Sackett machine (gypsum products).
744 All other.

MISCELLANEOUS.

745 Office machinery.
748 All other.

D. Machines Other than Working Machines.

1. Pumps.
2. Fans and blowers.
3. Turntables.
4. Compressors.
5. Automatic stokers.
6. All other.

E. Hoisting apparatus.

1. Elevators controlled (not construction elevators).
   (*a*) Cable, breaking.
   (*b*) Cable, unwinding.
   (*c*) Cable, overwinding (car rising too high).
   (*d*) Cable, caught by.
   (*e*) Counterweight, struck by.
   (*f*) Machinery, breaking.
   (*g*) Machinery, caught in.
   (*h*) Car, caught between floor and.
   (*i*) Car, caught between shaft side and.
   (*j*) Car, caught between gate and.
   (*k*) Car, struck by, in pit.
   (*l*) Caught between car and overhead equipment or top of shaft.
   (*m*) Car, struck by, elsewhere.
   (*n*) Car, sudden start or stop.
   (o) Car, dumping.

E. Hoisting Apparatus—Continued.

1. Elevators controlled (not construction elevators)—Concluded.
   - (*p*) Car rising too high.
   - (*q*) Fall of person into shaft, from floor.
   - (*r*) Fall of person into shaft, from car.
   - (*s*) Fall of person into car, from floor.
   - (*t*) Objects falling down shaft, from floor.
   - (*u*) Objects falling down shaft, from car.
   - (*v*) Objects falling from floor into car.
   - (*w*) Catching of load or part thereof between car and shaft.
   - (*x*) Gates, not otherwise classified.
   - (*y*) All other.
2. Elevators, automatic, and dumb waiters.
3. Elevators, sidewalk.
4. Construction hoists and elevators (not derricks).
   - (*a*) Cable, breaking.
   - (*b*) Cable, unwinding.
   - (*c*) Cable, overwinding (car rising too high).
   - (*d*) Cable, caught by.
   - (*e*) Counterweight, struck by.
   - (*f*) Machinery, breaking.
   - (*g*) Machinery, caught in.
   - (*h*) Car, caught between floor and.
   - (*i*) Car, caught between shaft side and.
   - (*j*) Car, caught between gate and.
   - (*k*) Car, struck by, in pit.
   - (*l*) Caught between car and overhead equipment or top of shaft.
   - (*m*) Car, struck by, elsewhere.
   - (*n*) Car, sudden start or stop.
   - (*o*) Car, dumping.
   - (*p*) Car rising too high.
   - (*q*) Fall of person into shaft, from floor.
   - (*r*) Fall of person into shaft, from car.
   - (*s*) Fall of person into car, from floor.
   - (*t*) Objects falling down shaft from floor.
   - (*u*) Objects falling down shaft from car.
   - (*v*) Objects falling from floor into car.
   - (*w*) Catching of load or part thereof between car and shaft.
   - (*x*) Gates, not otherwise classified.
   - (*y*) All other.
5. Mine cages, skips, and buckets.

   NOTE.—In those cases where mines are important, special analysis of mine-cage accidents should be made.
6. Cranes, locomotive.
   - (*a*) Car, striking person.
   - (*b*) Car, falling.
   - (*c*) Cable or chain, catching or striking person.
   - (*d*) Machinery, catching person.
   - (*e*) Hook or sling, catching or striking person.
   - (*f*) Load, struck by, swinging.
   - (*g*) Load, struck by, lowering or raising.
   - (*h*) Load falling, broken cable.
   - (*i*) Load falling, slipping cable.
   - (*j*) Load falling, breaking of hook.

E. Hoisting Apparatus—Concluded.

6. Cranes, locomotive—Concluded.
   - (*k*) Load falling, slipping of hook.
   - (*l*) Load falling, sling breaking.
   - (*m*) Load falling, machinery breaking.
   - (*n*) Load falling, hitch slipping.
   - (*o*) Load falling, failure of current on magnet.
   - (*p*) Objects falling from load.
   - (*q*) Falls from crane or crane track (not in erecting or rigging).
   - (*r*) Other.
7. Cranes, other traveling.
   - (*a*) Car, striking person.
   - (*b*) Car, falling.
   - (*c*) Cable or chain, catching or striking person.
   - (*d*) Machinery, catching person.
   - (*e*) Hook or sling, catching or striking person.
   - (*f*) Load, struck by, swinging.
   - (*g*) Load, struck by, lowering or raising.
   - (*h*) Load falling, broken cable.
   - (*i*) Load falling, slipping cable.
   - (*j*) Load falling, breaking of hook.
   - (*k*) Load falling, slipping of hook.
   - (*l*) Load falling, sling breaking.
   - (*m*) Load falling, machinery breaking.
   - (*n*) Load falling, hitch slipping.
   - (*o*) Load falling, failure of current on magnet.
   - (*p*) Objects falling from load.
   - (*q*) Falls from crane or crane track (not in erecting or rigging).
   - (*r*) Other.
8. Derricks and jib cranes.
   - (*a*) Derrick or crane, striking person.
   - (*b*) Derrick or crane, falling.
   - (*c*) Cable or chain, catching person.
   - (*d*) Machinery, catching person.
   - (*e*) Hook or sling, catching person.
   - (*f*) Boom swinging.
   - (*g*) Boom breaking.
   - (*h*) Load, struck by, swinging.
   - (*i*) Load, struck by, lowering and raising.
   - (*j*) Load falling, slipping cable.
   - (*k*) Load falling, breaking hook.
   - (*l*) Load falling, sling breaking.
   - (*m*) Load falling, machinery breaking.
   - (*n*) Load falling, hitch slipping.
   - (*o*) Load falling, failure of current on magnet.
   - (*p*) Load falling, not otherwise classified.
   - (*q*) Objects falling from load.
   - (*r*) Falls from crane load.
   - (*s*) Falls from crane cab, car, or track (not in erecting or rigging).
   - (*t*) Other.
9. Wood stackers.
10. Blocks and tackles, windlasses, capstans, and winches, not otherwise classified.
11. Hay forks, derricks, and stackers.

F. Conveyors.

1. Air hoists.
   (*a*) Objects falling from.
   (*b*) Caught in.
   (*c*) Struck by load.
2. Overhead trolleys.
   (*a*) Objects falling from.
   (*b*) Caught in.
   (*c*) Struck by load.
3. Belt and chain conveyors.
   (*a*) Objects falling from.
   (*b*) Caught in.
   (*c*) Struck by load.
4. Screen conveyors.
   (*a*) Objects falling from.
   (*b*) Caught in.
   (*c*) Struck by load.
5. Bucket conveyors.
   (*a*) Objects falling from.
   (*b*) Caught in.
   (*c*) Struck by load.
6. Platform conveyors and escalators.
   (*a*) Objects falling from.
   (*b*) Caught in.
   (*c*) Struck by load.

The committee recommends that machine accidents should be further classified by manner of occurrence and part of machine, as follows:

(*a*) Manner of occurrence, machine accidents.
   (1) Adjusting machine, tool, or work.
   (2) Starting, stopping, or operating machine.
   (3) Cleaning or oiling machine.
   (4) Repairing machine.
   (5) Breaking of machine or work.
   (6) Flying objects, striking operator.
   (7) Flying objects, striking person other than operator.
   (8) All other.

(*b*) Part of machine on which accident occurred.
   (1) Point of operation.
      NOTE.—Point of operation means that part of machine at which work is actually inserted and maintained during any process of forming, cutting, shaping, or other operation.
   (2) Belts.
      NOTE.—Accidents upon belts, pulleys, shafts, gears, or other driving mechanism or parts thereof which form the connection between a machine and the prime mover or intermediate drive, shall be charged to transmission apparatus. This includes parts attached to the machine. Accidents upon belts, pulleys, shafts, gears, or other driving mechanism, or parts thereof, which connect one part of the machine with another part of the same machine, shall be charged to the machine.
   (3) Cranks or eccentrics.
   (4) Flywheels.

(*b*) Part of machine on which accident occurred—Concluded.
(5) Gears.
(6) Set screws, keys, and bolts.
(7) Counterweights.

GENERAL NOTE.—The classification of part of machine and manner of occurrence applies as well to prime movers and hoisting or conveying machinery as to working machines.

II. VEHICLES (NOT INCLUDING CONSTRUCTION OF).

A. Cars and Engines—Steam and Electric Railways.

1. Train wrecks.
   (*a*) Collisions.
   (*b*) Derailments.
   (*c*) Car striking object on track without derailing.
2. Falls from or in.
   (*a*) In getting on or off, in motion.
   (*b*) In getting on or off, at rest.
   (*c*) While riding on, due to sudden start or stop.
   (*d*) While riding on, due to slipping or loss of balance.
   (*e*) While riding on, contact with overhead structure.
   (*f*) While riding on, contact with side structure.
   (*g*) Falls, not otherwise classified.
3. Struck by or caught between.
   (*a*) While coupling or uncoupling.
   (*b*) While switching.
   (*c*) While repairing cars or engines.
   (*d*) While repairing track.
   (*e*) While crossing track.
   (*f*) While standing or walking on track.
4. Other causes.
   (*a*) Setting or releasing hand brakes. (Exclude falls due to.)
   (*b*) Objects falling from. (Not in loading or unloading.)
   (*c*) Objects shifting on load.
   (*d*) All other.

B. Mine and Quarry Cars and Motors.

1. Collisions.
2. Derailments.
3. Falls from, due to sudden start or stop.
4. Falls from riding on tail chain.
5. Riding on, contact with roof.
6. Riding on, contact with rib or side structure.
7. Caught between, and overhead obstruction.
8. Struck by or caught between while coupling or switching.
9. Struck by, not otherwise classified.
10. Braking.
11. Spragging.
12. Lifting or pushing car.
13. Caught or struck by rope or chain.
14. Caught by car or load in dumping.
15. Getting on or off car.
16. Struck or caught between, not otherwise classified.

NOTE.—Include here animal drawn mine or quarry cars.

C. Plant, Trucks on Tracks.

1. Collisions.
2. Derailments.
3. Falls from, due to sudden start or stop.
4. Falls from riding on tail chain.
5. Riding on, contact with roof.
6. Riding on, contact with rib or side structure.
7. Caught between, and overhead obstruction.
8. Struck by or caught between, while coupling or switching.
9. Struck by, not otherwise classified.
10. Braking.
11. Spragging.
12. Lifting or pushing car.
13. Caught or struck by rope or chain.
14. Caught by car or load in dumping.
15. Getting on or off car.
16. Struck or caught between, not otherwise classified.

D. Automobiles and Other Power Vehicles.

1. Collisions, skidding.
2. Collisions, breaking of parts.
3. Collisions, all other.
4. Overturning, skidding.
5. Overturning, breaking of parts.
6. Overturning, all other.
7. Struck by.
8. Collisions with cars or engines.
9. Cranking.
10. Engines, not otherwise classified.
11. Breaking of car or part not resulting in collision or overturning.
12. Falls from.
13. Objects falling from.
14. Objects shifting on load.
15. Mechanical unloading.
16. All other.

NOTE.—All collisions of automobiles should be classed under automobiles, whether with other vehicles or with cars.

Accidents due to the engine in an automobile or other power vehicle should be charged to the power vehicle.

Accidents due to testing gas or gasoline engines should be charged to prime movers.

E. Bicycles.

F. Airplanes.

G. Animal-drawn Vehicles (not Mine or Quarry Cars).

1. Collisions with cars or engines.
2. Collisions with other vehicles.
3. Collisions with stationary objects.
4. Overturning.
5. Whiffletrees.
6. Falls from.
7. Struck by.
8. Objects falling from (not in loading or unloading).
9. Objects shifting on load.
10. Breaking of parts.

G. Animal-drawn Vehicles (not Mine or Quarry Cars)—Concluded.
11. Mechanical unloading.
12. All other.

NOTE.—All vehicle accidents due to runaways should be charged to animals (X–A–3).

H. Animal-drawn Implements (not Machinery).
I. Water Craft.
1. Collisions with vessels.
2. Collisions with other objects.
3. Capsizing.
4. Hawsers and other ropes.
5. Falls from, or jumping overboard.
6. Falls from, rigging.
7. Falls into, hatchway.
8. All other.

NOTE.—Accidents from machinery on water craft should be charged to the specific machine.

J. All other Vehicles.

III. EXPLOSIONS, ELECTRICITY, FIRES, AND HOT SUBSTANCES.

A. Boilers and Steam-pressure Apparatus.
1. Steam boilers, explosions of.
2. Steam boilers, escaping steam and hot water.
3. Steam boilers, all other causes.
4. Steam pipes, explosions of.
5. Steam pipes, all other causes.
6. Steam and hot water gauges, explosions of.
7. Steam and hot water gauges, all other causes.
8. Economizers and superheaters, explosions of.
9. Economizers and superheaters, all other causes.
10. Other steam-pressure apparatus, explosions of.
11. Other steam-pressure apparatus, all other causes.

B. Explosions of Explosive Substances.
1. Explosives, manufacturing and storing.
2. Explosives, transportation and handling.
3. Explosives, blasting.
   (*a*) Premature shot.
   (*b*) Misfires or delayed shot.
   (*c*) Windy shot.
   (*d*) Tamping.
   (*e*) All other.
4. Dust.
5. Gas.
6. Gasoline and other petroleum products.
7. All other.

C. Other Explosions.
1. Ammonia apparatus.
2. Other high-pressure apparatus.
3. All other.

NOTE.—Includes accidents due to bursting under pressure.

D. Electricity.
E. Conflagrations.

NOTE.—Give description of individual conflagration or catastrophe.

F. Hot Substances and Flames.

1. Hot water.
2. Asphalt, pitch, and tar.
3. Other hot liquids.
4. Molten metal, explosions of.
5. Molten metal at furnace or cupola.
6. Molten metal, pouring.
7. Molten metal or slag, all other.
8. Radiant heat from incandescent metal.
9. Metal not molten, handling of.
10. Hot surfaces, contact with.
11. Oxyacetylene or electric cutting and welding.
12. Flames, clothing.
13. Flames, all other.
14. All other hot objects.

IV. POISONOUS AND CORROSIVE SUBSTANCES AND OCCUPATIONAL DISEASES.

NOTE.—In case of occupational disease or industrial poisoning, it is desirable to subdivide specifically so as to show each occupational disease or poisoning. In the present state of knowledge in regard to the subject it is not possible to prepare a satisfactory code.[1] It must be built up as various occupational diseases and poisonings are reported and experience is accumulated. For this purpose it is especially desirable that detailed information should be published rather than general groups which will conceal the exact name of the disease or poison. The correlation of this information with industry and occupation is also exceedingly important.

V. FALLS OF PERSONS.

A. From Elevations.

1. Benches, boxes, chairs, and tables.
2. Bridges, dams, and docks (not in construction or demolition).
3. Cranes, derricks, elevators, and hoists in erecting and rigging.
4. Elevated bins, pockets, and tanks.

   NOTE.—Include here falls from, but not falls into.
5. Buildings in construction or demolition not elsewhere specified.
6. Floors, temporary.
7. Ladders.
   - (*a*) Breaking of ladder or parts.
   - (*b*) Slipping, twisting, or fall of ladder.
   - (*c*) Knocked off ladder.
   - (*d*) All other.
8. Scaffolds and stagings.
   - (*a*) Breaking or slipping.
   - (*b*) Breaking of tackle or support.
   - (*c*) Tilting of scaffold.
   - (*d*) Tilting or falling of loose plank.
   - (*e*) Other.
9. Boilers, engines, and machines.

   NOTE.—Include platforms or walkways on, but not stairways leading thereto.

[1] A tentative code for occupational diseases which has been prepared by the Workmen's Compensation Service Bureau, 18 Park Row, New York City, will be found to be helpful.

A. *From Elevations*—Concluded.
10. Piles.
11. Poles and trees.
12. Roofs.
13. Runways, balconies, and platforms (not loading platforms).
14. Loading platforms.
15. Gangplanks.
16. Stairs and steps.
NOTE.—Include all falls on stairs, steps, or landings.
17. Tramways and trestles.
18. Windows and wall openings.
19. All other.

B. *Into Excavations, Pits, and Shafts.*
1. Bins and vats containing hot or corrosive substances.
2. Bins and vats, all other.
3. Floor openings (not elevator shafts).
4. Manholes.
5. Excavations, not otherwise classified.

C. *On Level.*
1. Slipping.
2. Stumbling over fixed objects.
3. Stumbling over loose objects.
NOTE.—Include here stepping on rolling objects.
4. All other.
NOTE.—Strains due to near falls from slipping or stumbling, without falling, should be placed under slipping or stumbling in this group.

VI. STEPPING ON OR STRIKING AGAINST OBJECTS.

A. *Stepping on Objects.*
1. Nails.
2. All other sharp objects.
NOTE.—Stepping on rolling objects should be charged to stumbling.

B. *Striking against Objects.*
1. Nails.
2. Splinters or sharp projections from walls or structures.
3. Other fixed objects.
4. Fellow employee.
5. All other objects.

VII. FALLING OBJECTS—NOT BEING HANDLED BY INJURED.

A. *Collapse of*—
1. Buildings and walls.
2. Piles (stacked, stored, or piled-up material).
3. Scaffolds or staging.
4. Chutes, conveyors, and slides.
5. All other.

B. *From Elevations.*
1. Buildings not in course of construction or demolition.
2. Bins and pockets.
3. Tramways and trestles.
4. Runways, balconies, and platforms.

B. From Elevations—Concluded.

5. Racks and shelves.
6. Floor openings (not elevator shafts).
7. Chutes, conveyors, slides, and screens.
8. Machines and workbenches.
9. Piles (stacked, stored, or piled-up material).

NOTE.—Exclude accidents in piling or handling of material.

10. Dumps—at mines and quarries.
11. Buildings in course of construction or demolition (not otherwise classified).
12. Scaffolds and staging.
13. Temporary floors.
14. Floor openings—in building construction.
15. Other elevations.

C. Trees.

1. Trees in felling (not otherwise classified).

NOTE.—Include dead limbs and tops.

2. Trees lodged in felling.

NOTE.—Include trees and limbs struck by felled tree.

3. Trees, kickbacks of, in felling.
4. Spring poles—flybacks of.
5. Limbs, not in felling trees.
6. Trees, not in felling.

D. Objects Tipping over (except Vehicles).

NOTE.—Exclude objects which tip over while being handled.

E. Into Excavations.

1. Ditches and trenches.
2. Other excavations (not tunnels, mines, or quarries).

F. Cave-ins (not Mines or Quarries).

1. Ditches and trenches.
2. Tunnels.
3. Other excavations.

G. In Tunnels.

H. In Mines and Quarries—Inside.

NOTE.—Include all accidents from falling objects in mines and quarries.

1. Coal, rock, and ore at the working face (not roof).

NOTE.—Include rolls of coal or rock, but exclude accidents in stopes and all pillar robbing.

2. Coal, rock, and ore from pillars or ribs (not roof).

NOTE.—Include rolls of coal or rock.

3. Coal, rock, and ore from or in underground chutes, manways, and batteries.

NOTE.—Include rushes of coal, rock, or gob in same.

4. Roof in working places (not stopes).
5. Roof in entries.
6. Ore and rock in stopes (metal mines).
7. Timbers (not in handling).
8. From surface into shaft.
9. From cage into shaft.
10. From or in underground bins.
11. Cave-in of mine.
12. All other.

VIII. HANDLING OF OBJECTS.

A. Heavy Objects.

NOTE.—Exclude handling of objects by power appliances. Include objects set in motion by the handling of other objects.

1. Objects dropped.
   NOTE.—Include tipping over of object handled.
2. Objects thrown.
3. Objects falling from load (while loading or unloading).
4. Objects falling from pile (while piling or unpiling).
5. Caught between object handled and other object.
6. Strain in handling.
   NOTE.—Include only strains, hernias, etc., caused by excessive weight of object handled.
7. Handling (not otherwise classified).

B. Sharp or Rough Objects.

NOTE.—Include only injuries due to sharpness or roughness of object handled, not tools or machines.

1. Glass.
2. Protruding nails in objects handled.
3. Protruding wires.
4. Sheet metal and sheet-metal objects.
5. Slivers, wood.
6. Slivers, metal.
7. Castings.
8. Bones.
9. All other.

C. Hand Trucks, Carts, and Wheelbarrows.

1. Struck by truck handled by injured person.
2. Struck by truck handled by coworker.
3. Caught between truck and other object.
4. Object falling from (not in loading or unloading).
5. Overturning.
6. All other.

IX. HAND TOOLS.

A. In Hands of Injured Worker.

1. Glancing or slipping of tool in use.
2. Breaking or coming apart of tool.
3. Flying particles set in motion by tool.
   (*a*) Nails and spikes.
   (*b*) Metal chips.
   (*c*) Stone.
   (*d*) All other.
4. All other.

B. In Hands of Fellow Worker.

1. Glancing or slipping of tool in use.
2. Breaking or coming apart of tool.
3. Flying particles set in motion by tool.
   (*a*) Nails and spikes.
   (*b*) Metal chips.
   (*c*) Stone.
   (*d*) All other.
4. All other.

NOTE.—Causes given show manner of occurrence. Principal tools found as causes of accidents may be listed.

X. ANIMALS.

A. Draft Animals.

1. Kicks and stepped on.
2. Bites.
3. Runaways.

NOTE.—Include all vehicle accidents due to runaways.

4. All other.

B. Other Animals.

NOTE.—Specify any animals which may be especially important.

XI. MISCELLANEOUS CAUSES.

1. Flying particles (not otherwise classified).

NOTE.—Chips, dust, sparks, and other particles set in motion by working machines or tools are to be charged to the specific machine or tool. The above number relates only to nonassigned flying particles.

2. Doors, windows, covers, and gates, exclusive of elevators.
3. Drenching (not drowning).
4. Heat prostration and sunstroke.
5. Cold, including frostbites.
6. Lightning.
7. Violence of coemployee.
8. Violence, all other.
9. Wrestling, sparring, and horseplay.

NOTE.—Include all accidents directly attributable to horseplay, giving description of horseplay accidents.

10. Compressed air (not explosions).
11. All other.

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CLASSIFICATION OF INDUSTRIAL ACCIDENTS BY LOCATION AND NATURE OF INJURY AND EXTENT OF DISABILITY.

The committee recommends the following changes:

The brief introductory statement under the title should be omitted.

MULTIPLE INJURIES.

The paragraph in regard to multiple injuries, page 84, should be transferred to page 81, immediately following the main title:

"In case of an injury involving more than one location or one nature of injury, as specified above, as a rule the injury should be placed in that classification which indicates the most serious disability. If one or more dismemberments are involved, each should be separately listed. If the injury is a temporary disability only, it may be charged to the general part of the body, but if it is a permanent disability the above rule should be strictly followed."

I. LOCATION OF INJURY.

Under this heading the following should be added:

"NOTE.—If the injury extends ultimately to a part of the body other than that first affected, charge to the major part finally involved."

II. NATURE OF INJURY.

The classification should be amended to read as follows:

1. Bruises, contusions, and abrasions.
2. Burns and scalds.
3. Concussions.
4. Cuts, punctures, and lacerations.
5. Amputation, traumatic.
6. Dislocations.
7. Fractures.
8. Sprains and strains.
9. Asphyxiation.
10. Drowning.
11. All other.

NOTE.—In case of infection, nature of injury should be correlated with the infection. This is especially important in cases of bruises, contusions, and abrasions, burns and scalds, and cuts and lacerations.

III. EXTENT OF DISABILITY.

The classification should be amended to read as follows:

1. Fatal.
2. Permanent total disability—dismemberment.
3. Permanent total disability—other.

4. Permanent partial disability—dismemberment.
5. Permanent partial disability—total loss of use.
6. Permanent partial disability—impairment of use.
7. Permanent partial disability—disfigurement.
8. Permanent partial disability—other.
9. Temporary total disability.
10. Temporary partial disability.

IV. DEGREE OF PARTIAL DISABILITY.

In the first line of the note the word "injuries" should be changed to "disabilities."

ELECTION OF OFFICERS.

The following officers for the ensuing year were elected: President, George A. Kingston, commissioner, Workmen's Compensation Board of Ontario, Canada; vice president, Will J. French, member of the Industrial Accident Commission of California; secretary-treasurer, Royal Meeker, United States Commissioner of Labor Statistics, Washington, D. C. The new executive committee consists of Charles S. Andrus, chairman of the Illinois Industrial Commission; F. W. Armstrong, vice chairman of the Workmen's Compensation Board of Nova Scotia, together with the incoming officers and the outgoing president of the association, Mr. Fred M. Wilcox, member of the Wisconsin Industrial Commission. The next annual convention of the association will be held at Toronto, Canada, September 23–26, 1919.

RESOLUTIONS.

Resolutions relating to the business of the Association were adopted, of which the following are the most significant:

1. We contemplate with much encouragement the development of workmen's compensation and the accompanying growth of the kindred movement for the promotion of safety among the hosts of industrial workers within a period comparatively recent in the States and Provinces of North America. A better day dawned in the industrial world when these most helpful agencies were instituted among men. Mindful of continuing widespread mourning and heavy sacrifice of usefulness the steady reduction of these grievous losses is a source of deep satisfaction. Conscious of the imperfections of the compensation service we may well view with pride and gratification the more equitable and humane consideration of the unfortunate victims of industrial accident, the smaller and less wasteful levies upon industrial enterprise and progress, and the consequently more harmonious and mutually helpful relations between workmen and employers through the introduction and development of this important system. In feeling our way along dim trails or untrodden paths it were strange indeed if mistakes were not manifest and improvement required, but the record justifies indulgence of the hope that we shall profit by these mistakes and continue to more nearly approach ideal standards and irreproachable methods. To this end we pledge the highest endeavor of ourselves and our several jurisdictions. In this endeavor we crave the practical and sympathetic cooperation of good men and women everywhere.

2. The association desires to place on record its sense of appreciation of the services of the United States Bureau of Labor Statistics, and particularly the Commissioner of the Bureau, Dr. Royal Meeker, for the invaluable services rendered to the association during the past two years.

We recognize that the services of the Bureau are almost absolutely essential to the continued successful carrying out of the work of this association and we express the hope that the Bureau under the able administration of Dr. Meeker will be able to continue heading up the secretarial branch of the work for which he has shown such excellent qualification.

3. In the opinion of the association the executive committee should place at the disposal of the secretary a sum not exceeding $500 to be disbursed by him and accounted for in the usual way, in paying for special clerical services required in the conduct of the secretarial work of the association.

4. The association desires to place on record its appreciation of the courtesy shown by the Gisholt Co., the North Western Ordnance Co., and the Board of Commerce of the City of Madison in entertaining the members of the convention on the occasion of the fifth annual meeting. The strain of sitting through three sessions daily listening to addresses and participating in the discussion is very trying, and the thoughtful courtesies thus extended afford both a necessary relief and a very pleasant memory.

5. The association desires to bear testimony to the good offices and kindly courtesies extended to the members of the convention by the Industrial Accident Board of Wisconsin, as well as by the officers and members of the staff, on the occasion of this fifth annual convention, and especially for the services of its reporters in taking a record of the convention proceedings. We feel sure also that all the members here assembled will carry away a conception of an ideal city, which those of us who did not know Madison before had not hitherto entertained.

6. That we desire to place on record our appreciation of the action of His Honor Gov. Philipp, of this State of Wisconsin, in granting the association the privilege of holding its convention meeting in the rooms of this magnificent capitol building; also of his courtesy in coming to address the convention, and for his cordial words of welcome so amply seconded by many of the citizens of this State during our short visit in Madison.

7. This association desires to commend in the strongest possible terms the action of our Government in prosecuting the war against Germany with the greatest possible vigor.

We recognize that we are fighting an enemy who has lost, if he ever possessed it, all sense of what is right and honorable and decent in his relation to other nations, whose only conception of rule hitherto has been that of brute force, and who has been found guilty before the great forum of civilization of every crime in the decalogue.

To bargain for peace with such an enemy under present conditions may be likened to a man bargaining with a burglar who has stolen all he could get hands on and ravished, if not murdered, the family besides.

We believe there can be only one way to deal with such an enemy, and we note with the greatest possible satisfaction the fixed determination of all the allied Governments to prosecute the war until the enemy is driven back into his own country, and those of their rulers who are responsible for this world catastrophe are made to suffer that punishment which their crime against humanity so justly deserves.

Upon recommendation of the secretary that the I. A. I. A. B. C. amalgamate with the Association of Government Labor Officials, the following resolution was adopted:

Resolved, That the executive committee be authorized and instructed to confer with the executive committee of the Association of Government Labor Officials as to the advisability of the consolidation of the two organizations, and if in the judgment of said committees said consolidation seems to be advisable, that a referendum vote by mail be taken of the membership of both said organizations on the proposition of consolidation. If a majority of the membership of each of said organizations vote in favor of consolidation the executive committee is further authorized to arrange with the executive committee of the labor officials for a joint meeting of the two organizations in 1919 at which time the proposed consolidation may be consummated.

WEDNESDAY, SEPTEMBER 25—AFTERNOON SESSION.

Visits were made by the delegates to the Gisholt plant and other industrial establishments in Madison.

WEDNESDAY, SEPTEMBER 25—EVENING SESSION.

Chairman, Harry A. Mackey, Pennsylvania Workmen's Compensation Board.

III. STATISTICAL SESSION.

AMOUNT OF EXPOSURE AS FUNDAMENTAL IN ACCIDENT STUDY.

BY LUCIAN W. CHANEY, SPECIAL AGENT, UNITED STATES BUREAU OF LABOR STATISTICS.

The mere enumeration of accident cases has little meaning. Suppose, for purposes of illustration, that 40,000 accidents are recorded in one State and 50,000 in another. The principal result of such records is to arouse curiosity and lead to further questioning.

There will emerge almost immediately the question "How many people in each State were exposed to the hazards which produced the recorded accidents?" Unless some reasonably accurate answer can be given no beginning can be made toward the interpretation of the accident figures. Suppose that inquiry develops that the first of these States has 200,000 industrial workers while the second has 300,000. The frequency rate per 1,000 exposed will be 200 for the first State and 167 for the second. This reverses the quantitative relation and manifestly gives some definite idea of the accident conditions in the two States as compared one with the other.

It should be admitted at once that in a group of such varied character as the industrial population of an entire State the significance of such rates for certain purposes is lessened by the fact that the hazards are not shared equally. This condition is, however, always present in greater or less degree. No two persons of a given occupation have actually and precisely the same hazards.

Much confusion will be avoided if it be kept clearly in mind that there are two quite distinct things disclosed by accident rates: (1) Prevalence in the group under consideration; (2) degree of hazard incident to certain machines or processes.

To illustrate, the rates quoted above, 200 per 1,000 exposed in one State and 167 in another, disclose, in proportion to the accuracy of the basic data, the prevalence of accident among the workers of one State as compared with the other. These rates do not justify the conclusion that industry is conducted in a more hazardous manner in the State having the higher rate. This could be determined only by a process of finding the exposure and the accident occurrence for constantly narrowing industrial groups until occupational groups are reached. Suppose that the exposure in both States of those

operating lathes is determined and on relating this to lathe accidents it is found that one State has a frequency of 67 per 1,000 exposures while the other has a frequency of 90. It would then be justifiable to conclude that the hazard of lathe operation in the second State was higher than in the first.

Rates always have significance as disclosing prevalence. In the matter of hazard from particular machines or conditions, the significance is slight in extended groups, such as an entire State, but steadily increases as the determination is narrowed to industries, departments, and finally to occupations.

The point here emphasized is that in this whole process by which conclusions are finally reached regarding hazard, the amount of exposure is a fundamental factor without knowledge and use of which no really intelligible results are possible.

Before offering further illustration, a word regarding the nomenclature of the subject is pertinent. We have inherited from European sources, where these matters were studied before we began, the use of full-time or 300-day worker as the standard expression for the fundamental unit. In my judgment, there would be great gain if this association would break away from this inheritance and boldly adopt a terminology of its own. I would adopt as the name of the fundamental unit the expression "industrial unit." I would define it as "the equivalent of one man engaged in industry for 3,000 hours or 300 days of 10 hours each." I would use this industrial unit under various names in a great variety of discussions. If considering labor, I would say, for example, that product was so much per 1,000 units of labor. If accident was under discussion, the formula would be so many cases per 1,000 units of exposure. If labor turnover was the subject, I would say so many separations per 1,000 units of employment.

These different forms of expression simply mark the different aspects from which the industrial unit may be viewed. Numerically, in a given plant, the number of units would be the same whether they were designated as exposure, labor, or employment. The modifying words call attention to the particular phase of the general subject which is being considered.

The growing tendency to use "amount of exposure" in treating accident data suggests that the matter deserves consideration from a broader standpoint.

Further illustration of the importance of amount of exposure will be drawn from the experience of the State of Wisconsin. In 1917 the Federal bureau received from the Wisconsin Industrial Commission an elaborate classification of accidents according to causes for the year 1916. In comment upon this it was suggested that a single year did not afford sufficient volume in the smaller divisions to give

a fair statistical average and that it was highly desirable to apply the system of time allowances accepted by this association in order that severity rates might be computed.

Recently a compilation has come to hand covering a three-year period and having a complete application of the scheme of time allowances accepted by this association.

In response to request the commission has furnished a carefully worked out approximation of the amount of exposure in the State for those among whom the accidents occurred. It is desired to show by combination of these items of information something further regarding the value as a base of even an approximate determination of the amount of exposure. The calculation of rates for causes, as is here done, is not altogether new but is still so unfamiliar that a few introductory statements are justified.

In mortality studies the method of splitting up a community death rate by causes has long been used. A general rate of 14, for example, in a certain city will be found to consist of 5 for tuberculosis, 2 for pneumonia, and 7 for other causes.

It may be urged that hazard of a particular disease is common to the entire population, while danger from a particular accident cause is confined to a few. It is far from being the case that disease hazard causing death is uniformly distributed. Some people go through their days with no more danger from smallpox than from corn shredders. In both cases rates give an idea of the average prevalence of certain conditions in a population, part of whom are exposed and part are not.

Rate tables will shortly be published in the MONTHLY LABOR REVIEW showing both frequency and severity rates for a condensed list of the causes shown in the Wisconsin compilation. These are divided into two groups, according to the exposure available. First, there will be a table presenting causes for the entire number of people who are covered by the compensation act. Second, there will be a supplementary table devoted to the section of the industrial population engaged in manufacture. In this latter will be shown the rates for the different types of machines operated. On considering these tables it is found in the first table that, excluding cases of temporary disability of seven days and less, the general frequency rate of the State of Wisconsin is 40.7 cases per 1,000. This rate is made up in part by the following in the order of frequency: Handling objects, 8.6 cases; machinery, 7.7 cases; falls of person, 5.4 cases; falling objects, 4.2 cases; hand tools, 3.1 cases; hot and corrosive substances, 2.1 cases; cranes and hoists, 1.3 cases; wagons and carriages, 1.3 cases.

The point here made is that this series of rates by which we gain a just idea of the prevalence of certain types of accidents in Wiscon-

sin, considered as a unit, is wholly impossible without some sort of an approximation to the number of 3,000-hour exposures. This may be very crude and imperfect, but, however open to criticism it may be on the score of strict accuracy, it forms the only means possible to approach the intricate subject of the statistical study of accident causes.

It is instructive to notice the severity rates for the same cause groups, also arranged in the descending order of severity. The State of Wisconsin shows a severity rate of 5.9 days per 3,000-hour exposure. Machinery heads the list with 1.40 days, followed by falls of person, 0.77 day; falling objects, 0.76 day; handling objects, 0.45 day; wagons and carriages, 0.37 day; cranes and hoists, 0.32 day; hot and corrosive substances, 0.14 day; hand tools, 0.06 day.

It will be observed immediately that the order is not the same for severity as for frequency. Handling objects, which heads the list in frequency, drops to fourth place in severity. From the standpoint of the present paper the significance of this lies in the fact that without some common base to which these diverse elements of number of cases and number of days lost can be referred it is not possible to secure any notion of the true relation. When the common base of 3,000-hour exposures is applied, frequency and severity rates are obtained which together answer more questions regarding accident data and answer them more accurately than any statistical device hitherto utilized.

The need of analysis of the exposure as determined for a whole State into successively smaller elements may be illustrated by excerpts from the table devoted to rates for machines. During the three years covered by the compilation the exposure for all workers covered by the compensation act was 1,007,826 3,000-hour exposures. In manufacturing there were 745,915 3,000-hour exposures.

When the entire industrial population is used as a base of reference, the rate for machines used in manufacture is 7.5 cases per 1,000 exposures. When the consideration is narrowed to the portion of the population engaged in manufacture, the rate increases to 10.2. The first rate indicates the prevalence of machine accidents among the industrial population taken as a whole; the second, the prevalence in the portion of the population devoted to manufacture.

Of this rate the larger part is furnished by two sorts of machines, namely, metal working, with 3.6 cases per 1,000 exposures, and wood working, with 3.2 cases. These two groups of machines also exceed in severity, having 1.11 days per exposure out of a total of 1.86 days.

These relatively high rates would at once suggest that such machines deserved extra attention to determine whether there were not possible measures of prevention applicable.

After presenting these illustrations in an effort to make clear how important knowledge of the amount of exposure is to the proper understanding of accident data, the question naturally arises regarding the method of securing the needed figure.

The simplest and most direct method is possible in those plants where a time-clock system is in use. The time cards of the employees record exactly the hour of arrival and departure. The difference is the time at work, with as much exactness as it is possible to determine.

Since where time is kept in this way it is very common to pay by the hour, the time at work must be ascertained, and the addition of these amounts gives directly the production hours of the department. In some cases where the clocks are used simply as a check upon attendance, and their records are not employed in computing wages—as, for example, where all wages are on a piecework basis—some additional labor would be necessary to determine the total hours. This figure has so many uses that concerns can well afford this additional labor in order to have the means to compute labor costs accurately.

The record of total hours is convertible into an equivalent in terms of annual exposure by dividing it by 3,000.

The uniform use of equivalents in terms of the 3,000-hour year is strongly to be urged. It is very common to compute two sets of rates comparable among themselves but wholly incomparable with each other. This has arisen from the natural tendency to compile data monthly and annually. For monthly purposes the total hours will be divided by 250, one-twelfth of 3,000. Using the resulting figures for a series of months gives, as stated, rates perfectly comparable with each other but requiring to be modified before they will compare with annual rates. On the other hand, if the determination of equivalents is always on an annual basis the entire system of rates becomes comparable throughout with no need for modification.

This method of procedure does produce figures for each month which have a somewhat strange appearance. The total number on the pay roll is usually the thing considered as indicating the activity for a particular month. Division of the total hours for a month by 250 gives a figure sufficiently similar to the ordinary pay-roll total to seem appropriate. The result of division by 3,000 has no apparent relation to the accustomed figure.

The difficulty arises from the fact that the introduction of the time element into the situation is not yet a familiar one. It is recognized easily enough that a man working 8 hours at a given task is less exposed to its hazards than a man working 10 hours at an identical task. The feeling is strong, however, that "a man's a man for

a' that" and that the attempt to express him in equivalents for statistical purposes does not sufficiently respect his personality.

It is quite evident, however, that without this process of determining equivalents an even approximately exact presentation of the facts is impossible. When a statistical equivalent is necessary that one should be adopted which gives most directly the largest body of comparable results.

In many plants the record of hours is not kept but that of days worked is. In such a case it is often possible to determine a constant for the average daily hours in the department. For example, in a department in which there is some variation in hours it is found that the average is 9½ hours. If in a given period 20,000 days of work are done this will be approximately equal to 190,000 hours. This divided by 3,000 will give the usual equivalent, in this case 63⅓ 3,000-hour exposures.

In still other plants it may be necessary to resort to another device. Suppose it is possible to obtain an average annual employment by using a quarterly average, or better still a monthly average. This may then be multiplied by the number of days during the year on which the department was in operation. Such a procedure will give a number of "man days," which divided by 300 will give exposure in the ordinary terms.

Finally there is the case where payments in wages and some information regarding wage rates are the only available items. Suppose this to consist of a single pay roll and the total wage payment for the year. From the pay roll it is learned that in a given department there were—

10 men at 80 cents per hour	$8.00
15 men at 70 cents per hour	10.50
20 men at 60 cents per hour	12.00
30 men at 40 cents per hour	12.00
75	42.50

The total hourly earnings divided by 75, the total number of men, gives 57 cents as the average hourly rate. If the annual payments in the departments were $136,800, this divided by 57 cents would give 240,000 hours as the total hours of employment. This divided by 3,000 gives an annual exposure of 80.

Such a procedure gives a close approximation, provided there have been no considerable wage fluctuations. The wage rates above are the high rates now prevalent. If wages were lower earlier in the period it would be necessary to consider that fact and also the length of time during which the different rates prevailed.

To illustrate, assume in the department mentioned above three wage periods in the course of a year: (1) 3 months with 70 men and

hourly earnings of $35; (2) six months with 80 men and hourly earnings of $44; (3) 3 months with 75 men and hourly earnings of $42.50.

In order to get a true average annual exposure it is necessary to introduce the time factor. Multiplying the number in each group of men by the time factors 3, 6, and 3, and adding the results gives 915. Treating hourly earnings in the same manner gives $496.50. Dividing $496.50 by 915 gives 54 cents as the average hourly rate for the year. Dividing this again into the annual payment of $136,800 gives 253,333 as the total hours worked. This divided by 3,000 gives 84 as the annual exposure instead of 80 indicated when the figures for the last three months were considered alone.

By the application of these methods it is nearly always possible to secure a reasonable approximation to the exposure expressed in terms of 3,000 hours per year.

It may be objected that results are largely modified by the method of procedure and that it is unsafe to combine those obtained by one method with those derived in another way.

A number of careful and extensive tests indicates that the final rates which result from using these methods are not sufficiently different to modify the conclusions derivable from them.

If the volume of data is sufficient to be reasonably trustworthy, the methods outlined above may be used in determining the basic figure of exposure without hesitation, and those obtained by the different methods may be combined.

To recapitulate the methods of securing an approximate "industrial unit" as a base for all forms of industrial study:

1. Use actual hours as recorded by time clocks. Reduce these to a usable equivalent by dividing by 3,000.

2. When days of work are recorded determine the average length in hours in each department. Multiply this by the number of recorded days. Divide by 3,000.

3. When average employment and days in operation of the departments are available multiply these together and divide by 300.

4. When it is possible from one or more pay rolls to determine an average hourly or daily rate this may be divided into the total wage payments, giving total hours or days worked. These figures may be divided by 3,000 or 300, respectively, to give the desired unit.

After determining exposure for one year by the methods here outlined or by a combination of them it may be entirely feasible to utilize constants of increase or of decrease for later years. An attempt to describe fully the development of such a scheme would unduly prolong this paper. An illustration of its employment is found in the figures furnished by the Wisconsin commission in connection with the compilation already used for illustrative purposes.

The procedure will be given in full in connection with the tables to be issued in the MONTHLY LABOR REVIEW.

It has been proposed by some to abandon entirely the attempt to include the man in this consideration and confine attention to determining relations between accident occurrence and pay roll. This proposition has the merit of requiring as basic data items much more readily obtained than is the amount of exposure.

It introduces, however, so many elements of uncertainty due to the varying rates of payment and other variables that its satisfactory application would, on the whole, be quite as difficult as the method based on human exposure.

In the course of time it may be hoped that accident rates, both frequency and severity, will become sufficiently familiar that the nontechnical reader will have the same sort of understanding of them that he now has of mortality rates. It would be unfortunate just as this condition is beginning to prevail to introduce a new method probably but little, if any, more easily applied than the one now in use.

WHY TABULATE NONCOMPENSATED ACCIDENTS?

BY L. W. HATCH, CHIEF STATISTICIAN, NEW YORK STATE INDUSTRIAL COMMISSION.

When I was asked to discuss at this meeting the question which is the subject of this paper nothing was said as to why this question should be raised. Considering the tacit assumption that has all along been made by this association and its committee on statistics that noncompensated accidents are to be tabulated, the raising of the question now may seem rather late or quite uncalled for. That assumption appears in the very first action of this association concerning accident statistics when, at the meeting in Chicago, in January, 1915, it adopted a standard definition of a "tabulatable" accident identical with the previously established standard definition of a "reportable" accident, which latter included every accident causing loss of time other than the remainder of the day, turn, or shift on which the accident occurred.

But during the last three years we have learned much about accident statistics by experience, and one of the things that some of us have had thus borne in upon us is the great amount of work involved in producing adequate statistics of accidents and the difficulty of securing sufficient resources for such work. I venture to think that I give the common situation of accident statisticians to-day when I say that they are forced to a selection only from among various desirable lines of work. In a word, they have to do what they can and live in hopes of the rest sometime in the future.

Under such circumstances the accident statistician needs to know certainly that any line of work is sure to have its labor justified by the value of its results, and that need grows according to the amount of labor involved. Now, the tabulation of noncompensated accidents is always a heavy undertaking. In number they run to many times the total of compensated cases, five times as many in New York State, for example, at the present rate of reporting, with a total of 250,000 per year. Another consideration here is that, in the absence of follow-up work for purely statistical purposes, reports of noncompensated accidents are more incomplete and defective than those of compensated cases. The necessity of exact information for purposes of awarding compensation automatically insures the necessary data for statistical purposes on compensated cases, but for noncompensated accidents there is not the same necessity. Hence, as part of the work required for

tabulation of noncompensated accidents must be reckoned the task of securing full reports of all the necessary data.

It is by no means out of place, therefore, to raise our question, even to the extent of asking whether the assumption that has all along been made is well founded. If we find no occasion to alter that assumption, we may at least clarify the grounds for it, and thereby afford support for the efforts of statisticians to bring their work up to the best standards.

In order to be concrete as well as most practical, it will be well to take the word "tabulate" as meaning tabulate to the extent specified in the standard tables recommended by your committee on statistics.[1] That will mean tabulation by industry, cause, nature of injury, extent of disability (time loss), medical aid, wage, sex, and age. Also for present discussion by "noncompensated" is to be understood "tabulatable" accidents (under the definition of the committee on statistics) in which no compensation for wage loss is paid, whether medical benefits be paid or not.

I think we shall arrive most convincingly at conclusions if we recall at the outset that any accident statistics, to justify themselves, must be of distinct service for one of the following four purposes, namely: (1) Determination of rates for compensation insurance, (2) prevention of accidents, (3) equitable and accurate administration of compensation laws, and (4) measurement of current experience.

Considering the first of these, the statistical information necessary for determination of insurance rates comprises the amount of compensation or medical aid paid, or to be paid, together with pay-roll exposure, tabulated by industry classifications. This at once indicates that a noncompensated accident is of no significance for this purpose except as medical aid may be paid in connection with it. But under a compensation law requiring payment of medical aid the latter is an indispensable item of statistical information for the insurance carrier. It is an item which appears, of course, in connection with compensated accidents, but tabulations of it restricted to the latter class of cases would be wholly inadequate. There may be set down, therefore, as one tabulation of noncompensated accidents which is clearly necessary, one to show medical aid paid in such cases.

But as already indicated, this is an item of significance chiefly for the determination of insurance premiums. For this, what is necessary is the same as in case of compensation paid, i. e., tabulations showing amounts paid in comparison with pay-roll exposure by industry classifications. For such a tabulation, insurance carriers are practically best, if not solely, able to secure the necessary data, these

[1] References to the committee recommendations herein are to those in the report of the committee published in the MONTHLY REVIEW of the U. S. Bureau of Labor Statistics for October, 1917.

being automatically a part of their records. To them, therefore, as chiefly requiring this information and best able to prepare it, this sort of tabulation of noncompensated accidents might very well be left. Bear in mind that to propose to leave such tabulation of medical aid to carriers does not need to involve loss of such information to the public. To whatever extent is desirable carriers may and should be required by the appropriate public authority—superintendent of insurance or industrial accident board—to furnish for public information the results of such tabulations.

Tabulations of medical aid are as a matter of fact not called for by any of the standard tables recommended by your committee on statistics except one, namely, Table 5. The last column of that table calls for amount of medical aid for each class of disability, and will involve tabulation of noncompensated accidents for that item. This table is designed mainly to afford the means of comparing cost of different schedules of benefits in different States and is useful chiefly from the insurance point of view. As an item in those benefits medical aid is of course essential to afford complete results, and where the data are available should be tabulated. At the same time it may be pointed out that where data as to medical aid are not available, omission of that item would not deprive Table 5 of its chief value, which lies in its information as to compensation. This consideration carries greater significance, from the fact that complete data as to medical aid are not easily obtainable, owing not only to the great number of cases to be handled but also to a special difficulty growing out of the fact that large employers frequently furnish medical aid directly in plant hospitals or by plant physicians in amount exceeding the requirements of the law and without allocation of cost to each case.

The most important tables recommended by the committee, tables 1 to 4, call for distribution of accidents by industries, and by causes, according to extent of disability, and provide for a division of temporary disability cases into those with lost time of over two weeks, over one to two weeks, and one week or less. Table 5 calls also for distribution of noncompensated accidents according to length of time lost, by days. In any State where the waiting time is over one week, the data for the time loss in noncompensated accidents called for by these tables will involve much the largest amount of labor and difficulty of any contemplated by the committee's scheme. This is because of the fact previously pointed out, that this data is not ordinarily developed in the necessary records for making of awards and payment of compensation, and must be specially secured for the purpose of supplemental reports in the short-time disability cases, which are most numerous of all, amounting in New York State,

for example, to hundreds of thousands in a year. Let us consider, therefore, how far this labor is worth while.

It is sometimes said that it is important to collect this data so that when the question arises of reducing waiting time in a statute it may be possible to tell in advance what the effect will be as to numbers of workers to be affected and amount of compensation to be paid. Argument is sometimes made as though such information were indispensable for the settlement of the question of whether waiting time should or should not be reduced. But that idea may be dismissed as being from the same cloth as the argument which frequently cropped up when passage of the first compensation laws was being discussed, it being contended at that time that it would never be safe to pass any such law until it could be determined in advance just what it would cost. Reduction of waiting time, like enactment of compensation laws, is not a question of cost but of justice, and is being settled on that principle without awaiting determination of cost, as witness such reduction in 1917 in no less than 9 out of 31 States having compensation laws before that time.

From the point of view of insurance rates, there is something to be said for collecting the data in question in anticipation of a reduction of waiting time so as to afford more accurate early readjustment of rates. There are, however, two counterbalancing considerations on this proposition. One is that the assumption that dependable data for rate-making purposes are possible in the absence of compensation requirements whose administration necessitates the recording of the data is open to question in the light of comparisons of statistics of accident before and since the passage of compensation laws. The other is that there are now a sufficient number of States[1] having a waiting time of one week or less to afford a very substantial body of statistics of time loss in short-time disability cases, such as the committee table calls for in noncompensated cases in other States, developed under the advantageous conditions attaching to compensated cases. The more dependable data which should be available in these States may be regarded, I am inclined to believe (I am almost ready to prophesy that actually they will have to be depended upon for the purpose), as sufficient for necessary advance data for preliminary insurance rating purposes in a State about to reduce waiting time under two weeks, at least sufficiently so as to make it necessary to seek other reasons, if there be such, to justify the cost and labor involved in ascertaining time loss in noncompensated accidents.

[1] In 1917 there were 15 such States, namely, Connecticut, Illinois, Indiana, Idaho, Kansas, Minnesota, Nebraska, Nevada, Ohio, Oregon, Texas, Vermont, Washington, West Virginia, and Wisconsin. Also the U. S. Employees' Compensation law limits the waiting period to less than a week.

What has already been said indicates that we must turn to purposes other than determination of compensation insurance rates to find reasons for including noncompensated accidents. So far as light on the administration of compensation is concerned, in the nature of things it is statistics of compensated cases only that will be of service because the problems of administration are those of determining awards in accordance with the provisions of law. It is then from the point of view of accident prevention, or of the related one of measurement of increase or decrease in accidents, that the value of statistics of noncompensated accidents is to be appraised. More specifically it will be the value of statistics of frequency and severity by causes and industries, as called for in Tables 1 and 4 recommended by the committee, that chiefly must justify tabulations of noncompensated accidents. In many ways, as pointed out in the last report of the committee, these are the most important tables in the entire list.

In order to determine how important it is that the data concerning noncompensated cases called for by these tables should be included, as well as those concerning compensated cases, it will be well to consider just what questions it is to be expected that those tables shall answer. I take it these are three, namely: (1) How do the hazards of different industries compare? (2) How do the hazards from different causes compare? (3) How does the hazard in a given industry or from a given cause compare one year with another?

Theoretically, at least, it would seem to be necessary to have a complete measure of the hazard in question in order to answer any of these queries, and for that account would have to be taken of every accidental injury it caused, no matter how trivial. But is such completeness of measure so necessary for practical purposes which statistics of accidents can serve as to make it worth the great expense of securing it solely for that purpose, as in the case of noncompensated accidents? More exactly the question is this: With the differences in hazard which complete statistics of compensated cases will afford in hand (no one can for a moment question the need of having such statistics), how likely is it that the addition of noncompensated cases, i. e., those causing temporary disability of 14 days or less, would alter the results sufficiently to change conclusions for practical purposes? More concretely, if a safety inspector of a mutual insurance company in a single industry, for example, has before him full knowledge of the relative importance of the various hazards which he must combat, as measured by the compensable accidents which they cause, will the addition of noncompensated cases to his statistics be likely to show that he did not before properly distinguish between the greater and lesser hazards? Or will a State safety engineer, with the differences between industries as to hazard as shown by compensated

cases, be likely to have to revise his selection of industries for the purpose of devoting his attention to the more hazardous? Or, to cite one more example, will an industrial commission studying increase or decrease of accidents in its jurisdiction be likely to find conclusions from experience as to compensated accidents alone greatly at variance from that for all accidents?

A little consideration will, I believe, compel one to answer these questions in the negative. The first point to note is that, to a considerable extent, relative frequency of injuries, as between different causes or industries, would not be greatly changed by the addition of noncompensated cases. It is true that the ratio of more serious to less serious cases is not constant under different causes or in different industries, but the variation is not so great as to make distribution of compensated cases (that is, deaths, permanent disabilities, and temporary disabilities of over two weeks' duration) wholly unreliable as an index of accident frequency.

In the second place, and this is the main consideration, for all practical purposes accident frequency alone, to the extent that the relation of more to less serious cases is not constant, is of small value as an index of hazard. Only when to the factor of frequency is added the factor of severity of injuries can we arrive at any reliable index of hazards. Now, when the severity element is considered, it is almost entirely compensated accidents which are controlling in the results. This is because of the enormous difference in weight of the two classes of cases when measured by severity. This is well illustrated by the schedule of weighting for severity recommended by the committee on statistics. In that schedule a fatal accident is estimated as equivalent to the loss of 6,000 days' time. In a State with a waiting time of one week, the average time loss in noncompensated accidents is bound to be less than three days,[1] but if taken at that amount it will be seen that on the average it would take 2,000 noncompensated cases to equal in importance one fatal case. Or, in such a State, it would take 1,000 noncompensated cases to equal one hand dismemberment, or 100 to balance one loss of finger. A similar comparison for a State with a waiting time of two weeks, assuming the average time loss of noncompensated cases at six days (an overestimate for the same reason as above indicated), indicates that one death case would equal 1,000 noncompensated cases, one hand loss would balance 500 noncompensated accidents, and one finger dismemberment would equal 50 noncompensated cases.

A third consideration bearing on the question is the general fact, which should always be borne in mind in connection with accident

[1] Three days would assume an even distribution of cases according to time loss from one day to six days, whereas it is well known that the number of cases is greater in the shorter time grades.

statistics, that small differences in results are of doubtful significance. This is because of the great variableness of the units which make up the aggregates of accident statistics. No two accidents are exactly alike, so that there is always more or less variation in statistical results which represents pure chance for the particular time or place, instead of what is typical or permanent for the hazard under consideration. This is true both as to frequency of occurrence and also as to severity of resulting injuries, but to a greater degree for the latter than for the former.

From general considerations such as the foregoing, and in the absence of a test thereof by a study of statistical material, which I regret that I have not found time to make for this paper, I am not disposed to press conclusions too far. I am, however, inclined at present to the view that for most practical purposes which accident statistics can serve, the tabulation of noncompensated accidents is of minor importance. Certainly it is of very minor importance as compared with complete tabulation of compensated cases along the lines laid down by the committee on statistics. Particularly it can be urged that in any State where there is a choice between the two, the securing of data concerning exposure, necessary for computation of accident rates, should by all means be undertaken before tabulation of noncompensated accidents. I emphasize this especially because apparently not much progress has yet been made toward the achievement of accident rates by industrial accident boards or commissions, whereas such statistics are of the very greatest importance from every point of view. The reason for the paucity of this material undoubtedly is the fact that in most States the provisions of law or circumstances of administration are such as to make necessary special collection of data for that purpose in addition to that which is automatically recorded in the administration of compensation laws, and the collection of that data is a task of many difficulties and much labor. But it can not be urged too strongly that every State should put the achievement of such data in the very first rank of importance in its program for accident statistics.

Another point, by way of contrast, may also be urged here; that is, that if the inclusion of noncompensated cases in the tabulations must be at the cost of less prompt publication of statistics of compensated cases to any considerable extent, then their inclusion might well be subordinated to the prompter issuance of the latter. My observation is that thus far there is still much to be desired along this line of earlier information as to compensation experience in most States.

Do not understand me as arguing against tabulation of noncompensated accidents in accordance with the committee's scheme under any and all circumstances. On the contrary, where a commission

can afford to do it, in addition to the other statistical work of greater importance, tabulations of noncompensated accidents should be undertaken as being the ideal achievement in accident statistics. Assuming that that is to be done, there is one further question of relative values that I venture to add; that is, how far the ascertainment of time lost in each noncompensated case is necessary, when special inquiry to secure that item would be required (as would be the case to a large extent in most States). Doubt on this point is particularly strong for a State where waiting time is only one week, for in such case absence of exact time loss would not prevent preparation of the frequency data called for by the committee's tables, except to a slight extent, and that at the point of least moment, in Table 5, which would be an unimportant omission. Even in a State with two weeks' waiting time the frequency data called for by the committee's program would be short at the least important point, by failure to secure time loss in each noncompensated case; that is, only in Table 5, as in the case of one week's waiting time, and in columns 9 and 10 of Table 1, and columns 7 and 8 of Table 4. Without collection of time loss in noncompensated cases, it would only be necessary to combine the columns referred to in Tables 1 and 4, and this would detract comparatively little from the value of those tables for practical purposes.

More important would be the effect upon severity data of failure to secure time loss in each noncompensated accident when the latter are to be tabulated, because the committee's plan proposes to measure severity in terms of time loss. But even here there is an alternative for which much can be said. That would be to give each noncompensated temporary disability a uniform weight in number of days, using for that purpose as close an estimated average as could be made. If this seems like an arbitrary and inaccurate expedient, it can very positively be replied that it would be no more arbitrary, and probably less inaccurate, than data for time loss in compensated cases of death and permanent disability computed according to the committee's schedule of weighting in Appendix C, because the estimated average to be used for noncompensated cases would be one necessarily within far closer-known limits (between one and six days in a State with one week of waiting time or between 1 and 12 days where there is two weeks waiting time) than those used for death and permanent disabilities. Furthermore, the estimate for noncompensated cases would aggregate but a fraction of that to be used for deaths and permanent disabilities. However, since this is a proposal to alter substantially the recommended plan of the committee on statistics, the suggestion to substitute a uniform weighting for noncompensated accidents, as an alternative to determination of exact time loss in such cases, should perhaps go first to that committee.

The answer to the question, "Why tabulate noncompensated accidents?" then, is that such tabulation is necessary to afford complete statistics of accident experience, but that their inclusion is not a matter of first importance for most practical purposes of accident statistics and should be held secondary in value to attainment of complete and early statistics of compensated cases. It is frankly recognized that this conclusion has been reached by an analysis largely on a priori grounds, and is submitted subject to further discussion on those grounds, or better still to verification by the more laborious method of test by available statistics.

THE USE OF STANDARD ACCIDENT AND COMPENSATION TABLES.

BY W. H. BURHOP, SECRETARY, WISCONSIN COMPENSATION INSURANCE BOARD.

While the primary function of this discussion is to illustrate the use of the standard accident and compensation tables recommended by the statistical committee of the International Association of Industrial Accident Boards and Commissions, and to emphasize the practical yalue which these tabulations present to administrative bodies, it may not be too great a deviation to inject a brief résumé pertaining to the development and maintaining of the records which must form the foundation of the statistics involved.

While the committee has recommended detailed classifications of causes of accidents, of industries, and of nature of injury, also standard definitions and even table forms, no recommendations have been made regarding the procedure or manner in which the original reports find their way into the finished table. This, obviously, is an administrative question which presents a different problem in the various States. The industrial size of the State, the kind of accidents reported, the manner of claim settlement, and the jurisdiction of the administrative body are some of the factors which will influence the statistical procedure. Furthermore, so far as uniformity is concerned, the details of procedure are unimportant; our aim is to erect certain tables in which the facts are based on standard, uniform definitions and classified uniformly according to adopted classification codes. The manner in which this is accomplished rests with the individual State.

This discussion is not intended to present a model statistical plan, but merely to cite as an illustration the procedure employed by the Wisconsin Industrial Commission, and which was developed as the needs demanded and the budget permitted.

Employers of Wisconsin report annually from 15,000 to 18,000 industrial compensable accidents, or accidents causing more than seven days' disability. To enable a statistical department to compile and arrange this number of individual reports into table form, and do so with efficiency and accuracy compels the use of tabulating machinery. The safety department must have accident statistics to exercise properly its functions, and so the statistical department is continually called upon to compile statistics showing the accidents in certain industries, make comparisons for given periods, make

studies of specific causes, and even to show the accident experience of an individual employer over a period of years. No hand method of dealing with 50,000 injuries (the approximate number of accidents in Wisconsin during the past three years) would enable a department to collate all this information and do so with the rapidity demanded. With the possible exception of the smallest industrial States, each State would find this labor-saving machinery a well-paying investment, if not an absolute necessity to gather the information vital to the best administration of safety and compensation laws. This feature is here mentioned because the plan under discussion is based upon the use of machinery.

Where an accident report is received record is at once made upon an individual claim card. On this card all facts necessary to the proper adjustment of the claim are recorded. Space is available to indicate future payments and final settlement of the case as indicated by supplementary and final reports. Until the claim is settled the card is filed in a case containing all open claims, or claims in the course of adjustment. This work is done by the claim department, which is not a division of the statistical department.

When the claim department has made its original record of the injury, the report passes to the statistical department. The first function of this department is to codify the information; that is, to translate the various facts into code numbers. This interpretation of the report is a highly important function and should not be intrusted to one without a thorough understanding of the classifications and a reasonable familiarity with industrial processes.

Some of the information pertaining to the injury can be definitely determined from the first report, while such facts as the duration of disability, the amount of compensation and medical aid, can not be ascertained until disability has ceased. In many instances even the ultimate nature of the injury varies from that at first indicated.

For these reasons the statistical department can not complete the card from the first report. Such items as the date of the accident, industry class, the employer's file number, the accident number, the age and wage of the injured, the cause of the accident, and the nature of the injury are punched on the card from the first report, and then it is placed in an incomplete file arranged in order by file number. Periodically, weekly when possible, the claim department transfers to the statistical department all the claim cards of those cases which were settled finally during the period. These cards also contain the employers file and accident number, so that the two record cards can be brought together. The accident card is then completed and placed in a different file ready for tabulation.

All the accident statistics collated by the Industrial Commission are based upon closed cases, and injuries are charged to the period

in which the final payment was made. While this creates a slight error in a tabulation of accidents for time periods, the practical advantage in thus handling the records is so great that the method seems justified. The only discrepancy involved is that in case of a rapid rise in the number of accidents, this rise would not be shown until several months later. If, on the contrary, all accidents were to be charged to the period in which they occurred, a final tabulation for a certain year could not be made, or at least would have to be corrected, for a period of possibly 10 or 15 years.

Having thus completed the record cards, the statistical department is able to tabulate desired information in a very short time. Specific illustrations of information compiled for the use of various departments of the commission will be given later.

The standard tables suggested and outlined by the committee do not present a complete exhibit of accident statistics; they merely represent what the committee believes to be the most essential information, arranged so that the experience of the States may be combined. Some jurisdictions may not yet be able to meet even these minimum recommendations, while others may desire more detailed and varied tabulations.

The tables compiled by the Wisconsin Industrial Commission during the past three years are, in general, more detailed than the proposals of the committee. This, however, does not prevent the Wisconsin experience from being compared with tables formulated exactly in accordance with the standard, because the details can easily be combined. Tables 1 and 3 of the recommendations call for a distribution of kinds of injury by industries, also for exposure rates and time loss due to various classes of injuries. The permanent partial disabilities are grouped into one column. The Wisconsin commission prefers to itemize the permanent partial disabilities so that the number of disabilities to the various parts of the body can be determined. Instead of grouping all such permanent disabilities into one column, they are actually divided into 21 columns, showing separately permanent disabilities to the arm above elbow, arm below elbow, hand, thumb, one finger, etc., in accordance with the list employed in the weighting system presented with the report of the committee to the 1917 convention and found on page 142 of the MONTHLY REVIEW of the United States Bureau of Labor Statistics, issued in October, 1917. The commission has gone further than this and has indicated for each class of permanent injuries whether the member affected was amputated, or if not amputated, whether the disability was determined to be over or under 50 per cent allowed for amputation.

Instead of making two separate tables to show the nature of the injury and the time loss, the commission has combined Tables 1 and 3 of the committee's recommendations.

The only difficulty encountered in attempting to fully meet the standard was found in determining accident rates. The commission does not have a record of the number of employees in the various industry classifications, hence the rate per 1,000 full-time workers could not be determined. The only other measure of exposure is the pay roll. This must be secured from two sources, the insurance reports showing the audited pay roll by classes (Schedule Z) and the reports of employers carrying their own risk by permission of the commission. A slight discrepancy will be found in this combination of pay roll because the insurance reports are on a year-of-issue basis, while the reports of self-insured are on a calendar-year basis. The results, however, should be reasonably accurate.

Only with the aid of a table such as above discussed can the relative hazard of industries be determined. The safety man is in need of this information; and, with a broad exposure, an excellent check of compensation insurance rates, which are also expressions of relative hazard, is secured.

From the viewpoint of accident prevention, Table 4 of the recommendations is by far the most important. In this table the number and severity of accidents by causes is exhibited. As in the table previously discussed, the severity of the injury is shown by groups. All permanent partial disabilities are added into one column. While the relative time loss due to the various causes, that is to say, the relative importance of the causes, is derived by applying the weighting scale to the nature of the permanent injury, the Wisconsin commission believes that it is of additional value to show the permanent partial disabilities in detail. As in Table 1, therefore, the extent of the disability and the part of the body affected is presented; also if the injury resulted in amputation, or, if not, then the degree of disability.

The argument is consistently made that the number of accidents alone is no criterion of the relative hazard of the instrumentality producing the injury, but that the severity or gravity of the injury as well must be known. While this viewpoint is not contradicted, the number of accidents, especially for some causes, is quite as important to the safety man as is the severity of the injury. The nature of the injury is in a great many cases purely a matter of chance. A stamping press which "repeats" is just as much of a danger if by repeating it amputates a worker's finger, his hand, or if no injury occurs whatever. If the workman's entire hand had been under the

die when the repeating occurred, the loss of the entire hand would have resulted. The fact that at that particular moment only his finger was exposed, or no injury resulted, is only a chance occurrence which does not minimize the hazard. The fact that a mason's scaffold is not properly guarded, and as a result a brick falling from it strikes a helper below a glancing blow on the arm causing a slight disability, presents just as serious a hazard as if a fatality had resulted. It was only by chance that the brick did not strike the workman on the head and kill him. It is largely for this reason that the commission believes in a detailed exhibit of causes of accidents as well as nature of injury. A table giving such detail is the most important guide which statistics offer to accident prevention. To be of maximum utility, however, the causes must be given in considerable detail, and the mode of prevention must be emphasized. It is not enough to know that an elevator fell, causing injury and death. The important thing to know is why the elevator fell. A different method of prevention exists for every different cause of the elevator falling. Likewise, it is insufficient information to know that a scaffold fell, or that a workman fell from or with a ladder. These facts alone tell nothing regarding the prevention of similar accidents. So far as possible a cause classification should show why the accident happened, or, if this can not be done, a subsidiary classification of manner of occurrence should be employed.

Tabulations showing the manner of occurrence have been employed by the Wisconsin Industrial Commission for several years, especially in making detailed studies of particular causes. Such a presentation should exhibit the injuries caused because of the wearing of loose clothing, slippery or uneven floors, oiling or adjusting the machinery while in motion, breaking machine parts, and other contributing causes. Metal burns can be tabulated to show how many could have been prevented by the wearing of proper shoes and leggings; eye injuries due to grinding or chipping should be correlated with wearing or not wearing of goggles; and likewise there can be many other comparisons of similar nature. This is the real information needed to conduct a safety campaign properly, and in no other branch of accident statistics has the commission emphasized detail so much as in the causes of accidents. The Wisconsin cause classification presents much greater detail than the committee code, but this can readily be combined so that comparability is not destroyed.

Tables 5 to 13 of the recommendation have been prepared by the commission for about five years. Table 5 presents the injuries by nature of severity and compensation and medical cost. This table, with Tables 6 and 7, not only pictures the results and adequacy

of the compensation act, but is an absolute necessity to determine accurately the effect in cost of new legislation. Legislatures will want to know such facts before they take action on bills offering changes, and insurance companies must have this information to increase or decrease their rates properly. With the aid of these tables the Wisconsin commission has been able to determine for the legislature the cost changes very accurately; as a matter of fact, in the final draft of the bill passed by the 1917 legislature, cost tables prepared by the commission were employed as an important guide.

The tables discussed are the most important recommended by the committee. This list, however, is far from exclusive, considering the entire field of useful accident statistics. Many special studies to throw light on particular problems can and should be made. Some of these have been previously referred to. Important causes such as saws, emery wheels, stamping presses and the like are adapted to more detailed analysis, having in mind always why the accident occurred. For such studies the manner of occurrence classification is useful.

A detailed exhibit of the causes of accidents in the logging industry has guided the commission and the logging operators in establishing a set of rules for the workmen. When an employer or a workman is told that a certain number of men have been injured because they carried the saw or ax under their arms, a rule to always carry these tools on their shoulders carries a great deal more weight.

Likewise orders and rules have been made for safety in the mining industry, based upon experience indicated by accident statistics. Square-headed jointers have been legally condemned because statistics pictured their danger to the fingers and hands of workmen. The use of goggles in certain occupations has been made compulsory because statistics displayed the danger to the unprotected eye. Elevator orders have been made and increased in the light of tabulated experience. Children have been prohibited from working in certain industries and on certain machinery because the tabulated experience of the past has indicated the hazard to be too great. Safety rules have been established in the building industry and were founded largely upon statistics.

Using accident experience to still greater detail, exhibits are made to show in detail the record of the larger employers. Such a table is placed in the hands of the inspector prior to his visit to the respective plant. With this information in hand he can be guided by former experience in making his inspection; he can also emphasize his arguments for safeguarding. Inspectors report this information to be of great aid and value.

For large employers, accident frequency is the main gauge of the effectiveness of safety work. A current record of the experience of individual employers should be kept. A rise in the frequency curve is an invitation for the State safety department to visit the plant.

Maintaining proper accident statistics is the accounting system of safety work; it is just as necessary as a cost accounting system of our largest industrial enterprises. True, we can talk safety without facts, but it means groping in the dark, misdirected energy, and lacks the punch of certainty and definiteness which distinguishes serious and effective work from superficial propaganda.

THURSDAY, SEPTEMBER 26—MORNING SESSION.

CHAIRMAN, CHARLES H. LEMON, M. D., MILWAUKEE, WIS.

IV. MEDICAL SESSION.

SHOULD MEDICAL SERVICE BE LIMITED IN COMPENSATION CASES?

BY CHAS. H. LEMON, M. D., MILWAUKEE, WIS.

We know that in the past, prior to the establishment of the workmen's compensation act, first-aid treatment was about all that the vast majority of injured workmen received at the hands of their employer or the insurance carrier. Nobody cared very much whether this first aid was the best that could be had or where it was given. The employer in the large cities called an ambulance and the man was removed from the premises; usually he was taken to a city hospital where routine treatment was given by internes, or young men on the staff, who were without experience.

Medical service should be rendered to an injured employee, first, because it is humanitarian to do so, and educated public opinion demands it; second, it should be rendered because it is important for industry that the man shall be returned to his employment with the least possible loss of working days.

The steam railroads in the past were pioneers in the manner of furnishing medical service to injured employees. We will not admit, however, that their action was entirely unselfish. The medical profession was subsidized by free passes, and with the exception of isolated cases in the large cities the free pass was about all that the average railroad surgeon got for his services. This practice established a low fee basis, and even the chief surgeons in the metropolitan cities were greatly underpaid for the work they did. There was an alluring fetich in the title "railroad surgeon."

We must recognize as an entity what is known as educated public opinion, and any treatment on the part of the employer which seems like indifference to the sufferings of our fellow men will result in a public remonstrance which can not go unheeded.

The employer, therefore, should render medical service, not merely because the law requires him to do so, but because public opinion demands it.

The character of the medical service to be rendered may well receive consideration at this time. It occurs to the writer that the best medical service that a community affords is none too good for an injured employee. The limitations that the most experienced surgeon must admit in the presence of a serious injury, particularly to the bony skeleton, should place a burden upon the employer not easily gotten rid of, and when I say employer I must include the insurance carrier; for but comparatively few of the large number of firms in a commonwealth can afford to carry their own risk. The larger companies will endeavor to employ men of known experience, because experience has shown that where skillful first aid is given the ultimate cost of the accident is reduced to the minimum and the injured employee will suffer less permanent disability. Some of the largest institutions, however, are endeavoring to cut the cost for medical service either by the employment of full-time men, who are usually without any personal experience excepting such as they have received as internes in metropolitan hospitals, or who are without any experience at all, and accept the position because the salary offered gives them a certain livelihood.

The medical man of large experience will seldom be found outside of the metropolitan cities. No criticism therefore should be made of plants of moderate size remote from the larger cities, which must employ the surgical talent that is available in their communities. It is unfortunately true that doctors as a class are self-opinionated and with few exceptions are entirely satisfied with their own work. In their opinion, results which are far from what might have been attained are due to "complications," and this diagnosis covers a multitude of sins.

We occasionally find a doctor living in a community remote from the larger cities who recognizes his own limitations and seeks advice from those of larger experience.

Criticism, however, is to be directed to the character of the medical service offered by some insurance carriers, who are seeking to take advantage of the cupidity of the medical profession by employing so-called surgeons for the treatment of injured employees, whose one reason for employment is that their fees are low. It is my observation that some of the insurance carriers are hoping to educate some of these men at their own expense in the hope that in time they will become competent. It is my opinion that no man is justified in doing major emergency surgery who has not had a training in this class of surgical work under a competent surgeon. The experience of the insurance carriers is sufficiently large at this time to have taught most of them that competent surgical service is the most economical, and in the larger cities they are employing a group of men who have specialized in this class of work. For Mil-

waukee, I will say that the men who represent the insurance companies are doing excellent work, and without exception they are men who have had not only excellent hospital experience prior to their entrance upon the field of surgery, but they counsel with each other when cases of unusual character present themselves. Without making a personal investigation into the individual cases that I have in mind, I would infer that the services rendered are satisfactory both to the injured employee and to the insurance carriers. Employment by large corporations and by insurance carriers of trained nurses for the routine minor injury is a practice to be commended, because it is both economical and encourages the injured workman with the small infection to seek aid ready at hand.

Legal gentlemen representing the insurance carriers have told me that the difficulty with the medical profession is, it makes the after treatment so expensive by what seems to be unnecessary repetition of dressings, that the medical profession has brought itself into disrepute, and has forced the insurance carriers to seek other means of avoiding what appears to be an excessive charge for the subsequent treatment of the cases. It would seem that prudence on the part of the medical profession would prompt a careful revision of the subsequent dressing problem, so that it would not become a burden to the insurance carrier.

Medical service that is not continuous has never been popular with the medical profession. In the personal relation, which is so frequently established between the doctor and patient, it has always been a difficult matter for a physician either to discharge a patient or to be dismissed by him. Any plan of medical service which does not give the physician an abundance of time to cure the patient will be at once unpopular with the great body of the profession.

Emergency surgery in the past has found few who were willing to give the large amount of time necessary to the first treatment, because the day following, in a large number of instances, the cases passed out of their hands. The cases were referred to the interne in the metropolitan hospital and were prized by him because he had an opportunity to demonstrate his personal ability. The interne had no personal interest in the result to be attained and he certainly had no responsibility; and experience shows that the victim paid dearly for the experience he furnished to the young surgeon.

If medical service is to be limited, no first-class surgeon could be induced to undertake it. The large number of major accidents occurring in industries cause injury to the bony skeleton. These injuries are notoriously slow in recovering. There are so many factors which enter into the problem of repair of fractures of bone, both simple and compound, that few, even among the most experienced, are able even to approximate the period that will be necessary for

complete recovery. There are also many accidents which occur during operations, beyond the control of the surgeon, arising out of the use of materials commercially made and handed to the surgeon at the operating table, which cause infection and complicate an otherwise clean case, requiring many months to effect a cure.

I recently had a case of osteomyelitis follow an operation for delayed union that was caused by the use of kangaroo tendon; the osteomyelitis occurring in the drill hole in the bone made for the kangaroo tendon; others have had similar experiences.

If surgery were like carpenter work we could always give a definite prognosis as to the period of recovery. The complications caused by injury to the soft parts, such as the destruction of the nerves, thrombosis of the blood vessels, laceration of the muscle and fascia tissue, frequently can not be foreseen and are not infrequently entirely overlooked when obscured by some other serious injury which must be given priority of treatment no matter what happens elsewhere in the body.

Many times injuries occur which are not attended by danger to life, but which require long periods of treatment before recovery ensues. I cite for an example the matter of extensive burns of the chest, the back, and the extremities. Not only, in these cases, must these primary lesions be healed, but frequently extensive operations must subsequently be performed to neutralize the effect of the contracture of scar tissue. We are all familiar with infections arising from very slight wounds of the fingers which require months to effect a healing. In the hands of the experienced the time will be shorter for the healing period, but frequently when first seen, so much destruction has occurred and such important structures have become involved, that, even with the most skillful attention, many months elapse before the man is able to return to his work, and then with a seriously deformed hand.

Injured employees are not willing to part with even small portions of their fingers in order to shorten the period of convalescence. Many crushing injuries involving the pulp at the extremities of the fingers, with no injury to the bony portion of the finger, require from six to ten weeks to heal by granulation. The amount of tissue that is built up is oftentimes amazing and unless much scar tissue forms, the resulting wound is infinitely better than any amputation stump. If we were permitted to make amputations freely in such injuries to the hand, a two-weeks period in the larger number of cases would be all that is required.

As surgeons, we must conserve that which can be saved and in the treatment of the cases we must ignore any question of expense to the employer or the insurance carrier when such question of ex-

pense involves the loss of any useful portion that remains of an injured member.

No surgeon having regard for his reputation would be willing to reduce a fracture, place the same in a plaster cast where possible to do so, and then resign the case to another surgeon for subsequent treatment. It leaves too great a loophole for the shifting of responsibility as to the ultimate result of the case.

Injuries to the bony skeleton, particularly those involving the spine, the pelvis, and the upper portion of the thigh bone, recover slowly, and can not be treated within a time-limit period. No surgeon should be asked to treat, without compensation, a patient after a time period has expired. This practice in time would lead to a multiplication of fees for the period prior to the expiration of the time limit and this practice is essentially dishonest.

There are cases which are hopeless from the beginning and these cases obviously should not be treated excepting on a permanent, complete disability basis, excepting for a brief period subsequent to the reception of the injury, which would enable the attending surgeon to have a competent consultation to assist him in arriving at such a decision.

These cases, of course, require prolonged hospital treatment, but the provision of the law should be such that this factor would be taken care of in the amount set aside for the permanent total disability.

The time will probably never come when either the employer or the insurance carrier will fully appreciate the fact that the primary treatment of an injury is the most important factor that they have to deal with. The period necessary for healing must be measured by the thoroughness of the primary surgical treatment that follows the accident. More can be done by a competent surgeon, experienced in the treatment of emergency surgery, in the few hours following the accident, than the most skillful surgeon in the world can accomplish in the week following. The prevention of infections in compound wounds of the joints and in compound fractures of the bones is a possibility that has been frequently demonstrated; but in actual practice it is seldom effected because of a lack of skill on the part of those who, for the greater part, are treating these wounds. The war surgery of four years has developed the fact that extensive lacerated and contused wounds can be cleaned by the removal of the injured areas with the scissors or the knife and that these wounds heal frequently by primary intention because of a vigorous blood supply that is capable of destroying infection that is not massive in quantity. This fact has been known to the railroad surgeons for many years and many cases could be cited to prove the fact.

It would seem the part of prudence to employ, therefore, men experienced in this specialized class of surgery, rather than to pick up the first man who happened on the job, because, in your excitement, you thought the unconscious man was in danger of dying and your sense of responsibility became lessened when a medical man of even the most limited attainments made his appearance upon the scene.

Is it not a fact with almost no exceptions that nothing is ever done by the surgeon called to the scene of an accident other than what a bystander could do, that in any way determined the question of life or death, until the patient had been placed in a hospital, where apparatus and materials are at hand to provide the proper surgical treatment? I would not be understood to say that a surgeon should not go to the scene of accident; an important artery might be severed which, without prompt attention, would cause death; or the patient might be electrocuted, and those present might be without skill in the matter of resuscitation; or there might be severe pain which would necessarily need a measure of relief prior to the sufferer's transfer in an ambulance. It is the factor of uncertainty which strikes terror to the heart of the lay person and which so frequently brings to the injured physicians who are without the necessary special training. Once in charge of the case, they are loath to give it up. The provision of the statute which gives the employer the right to call surgeons of his selection is the saving clause which has insured to workmen competent medical attendance. The employer will usually give to his men the best medical service the community affords, and experience has shown this to be the rule. The medical man, therefore, should not be handicapped by a time limit. He should give the best that he is capable of to the injured man, with the sole idea of lessening the period that the worker is taken from his daily labor. He should be permitted to make as many operations as are necessary and in reason to accomplish this result. These operations obviously can not be too close together, and I speak from experience when I say that the intelligent cooperation of the patient in recognizing the necessity for subsequent operations and submitting to them for his own good has been the most comforting experience of my own personal professional career. To hesitate to operate a second time, or the third time, to correct something which at the time of the first operation was impossible to foresee, is to confess weakness and lack of ability to meet a definite situation. As surgery is an art and not a trade and as the surgeon is at the mercy of the idiosyncrasies of his patient, there must, in the experience of all, come cases which bring disappointment and which require further adjustment; but they should not bring discouragement to the surgeon nor to the patient.

In short, the emergency surgeon should be given every facility as to place, time, and assistance that will enable him, with a free hand, to do for an injured employee that which would be impossible under any other condition, not limiting him, either as to the expense to be incurred or the time to be consumed for the accomplishment of this humane object.

I may epitomize all that I have written by quoting the words of Mr. F. M. Wilcox of the Wisconsin Industrial Commission in a personal communication on this matter:

"Unlimited medical service should be provided. The relatively liberal provisions of the Wisconsin act in this respect have insured to injured men a much higher quality of medical attention than they ever had under the common law system or than they will ever get under any compensation system which only makes a very meager allowance, such as we have in some of the States. It is hard to measure in dollars and cents the value of proper medical treatment. If the injured man is left to select his own attendance his first thought is to get it as cheaply as possible. Rarely would they get hospital attendance, whereas, under the Wisconsin system, it is an unusual thing for a man with any major injury to be denied it."

BETTER TREATMENT FOR INDUSTRIAL ACCIDENT CASES.

BY MAJ. P. B. MAGNUSON, OFFICE OF THE SURGEON GENERAL, WAR DEPARTMENT, WASHINGTON, D. C.

Gentlemen: You have all had plenty of experience with doctors, and most laymen look at doctors as M. D.'s and all M. D.'s are doctors and all doctors are the same. I think the industrial commissions have changed their minds about doctors. They have had experience—we have all had experience—with the young man who has just come out of college into industry.

I don't know how much the layman is expected to know about the different classifications of the medical schools in this country. We have a number of classifications under the American Medical Association, the A-plus school—standing the highest—and the A, B-plus and the B, and these are rated according to their faculty, their equipment, their clinical facilities. Now, it makes a good deal of difference to a man in his education as to what sort of contact he has had during his student days—in the formative period. A man who has gone to one of the schools that we have in Chicago, which we call the "mill" and which the State board of licensers has been trying to put out of business for a good while, is not apt to have very high ideals when he comes out of school. He gets a job, usually, as a night surgeon at some large plant to help himself through school and when he comes out, instead of taking an interneship, he goes right into industrial work nine times out of ten. Why does he go into industrial work? Principally because, to the average corporation, the doctor is a doctor. The president of that corporation wouldn't take that man on as his own family physician, but it never occurs to him that a cheap doctor is an expensive proposition.

I would like to tell something that happened to me when I first went into industrial work. I had been with Dr. Murphy for several years as his assistant, and, upon his advice, went over to the stockyards—along Halstead Street—to get a little more experience. I went in to see the president of one of the large corporations over there and asked him if he didn't want a doctor.

"No," he said, "We have got one doctor; we don't need any more."

I said, "How much do you pay him?"

He said, "I don't know, but I will find out," so he called up the claim agent. They were paying the doctor $75 a month. They were being cheated, I think.

He said, "What do you want to do it for?"

I said, "I want to do it on a fee basis."

He said, "How much will that cost?"

I said, "It will cost you $2 for the first office visit and $1 for every other one after that; $3 for the first call, and $2 for every one after that."

He said, "That will run over $75 a month."

I said, "I hope so, or I don't want the job."

After thinking it over—I had quite a conversation with him—I asked him if he knew anything about his doctor. I said, "Where did he graduate from?"

He said, "I don't know."

"What experience did he have before he came to you?"

"I don't know."

I said, "Do you know who he is?"

"Well," he said, "I know his name is so and so."

"Well," I said, "Do you think it would save you any money if you had surgical treatment which was a little better than you are getting now?"

He said, "I don't know; but I am willing to gamble with you. I will pay you on a fee basis, and I will let the other fellow stay here and pay him a salary, and the fellow that has the most business at the end of three months I will let have the job." He added, "You are starting out with a handicap, because the boys know this other fellow and they don't know you."

I said, "Maybe that is no handicap; that may be an advantage."

So we went to it. At the end of 3 months I am glad to say I had about 80 per cent of the business. At the end of 6 months the bill for that one company, on a fee basis, totaled six hundred and some dollars—that same work the other fellow was doing for $75. I sent the bill to the claim agent; he refused to O. K. it. He sent it to the general manager and he refused to O. K. it. He sent it up to the president. The president wrote me a letter and told me that if I didn't cut that bill down he was going to get another doctor. It wasn't very cheerful news for me, because I just had a new boy in the family and I wanted to send him through college some day, and I had very little other business besides that railroad business. But the president of the company was Irish and I knew he had to get about so much out of his system before I could talk to him, so I went over and let him get it out on me. Finally he ended up by saying he wasn't going to pay that bill and wouldn't stand for it.

I said, "Mr. Fitzgerald, you may never pay me another bill, but you are going to pay that one all right. If the chairman of the

board of directors came along here and said, 'Mr. Fitzgerald, we don't think you earned your money last month and we are going to let you go at the end of this month, and we are not going to pay you last month's salary,' I suppose you are the man that would sit down and say, 'That suits me.' You would tear the roof off the house and get your money, and that is just the way I feel about it."

He said, "Young fellow, if you have got anything like that to say to me you go home and write it."

I went home and wrote him a nice letter. I told him I wasn't the man he wanted if he wanted arms and legs cut off when there was some chance of saving them. If he wanted fingers cut off when there was some chance of doing tendon sutures, nerve grafts, and tendon transplantation I wanted him to get another man, because my reputation was worth more to me than his money was; that dressings cost money; that careful treatment cost money, but it saved money. He sent me a draft in three days.

At the end of the year this was the record: We had had almost 10 per cent more accidents than we had had the year before; we had had only one lawsuit filed as against thirty-one the year before. There was a total saving of $20,000 in the claim department, and the surgical department expense had been boosted almost $900.

Now, I am not telling that as recommending myself to you gentlemen, because the Surgeon General is employing me now, and I don't need any outside jobs, but it does show, not only what careful medical treatment and surgical treatment will do, but what the treatment of employees will do. We put those men in private rooms and gave them a night and a day nurse if they were very sick. We gave them everything that money could buy to further their treatment. We didn't keep them in luxury, but we gave them everything that a man who can pay for the best gets, and the results saved the money. Now, that all leads up to the fact that the training of a surgeon should be brought to the attention of the employer as much as the training of his general manager. He should look into the training of the surgeon that he employs and the man's character as carefully as he does the general manager's, because it pays in dollars and cents, and if we are going to talk to a corporation head, we have got to talk in dollars and cents and not in medical ethics, because he isn't interested in medical ethics; he is interested in dollars and cents saving at the end of the year. He thinks it is saving to have a contract surgeon. Now, there are a good many good men who do work on a salary basis, but most of them will not do it—that is, especially in the large cities where they have a large outside practice. There are a great many good men who have started as contract surgeons, simply as a stepping stone to work up, but those men leave it, because they can't get adequate compensation for their work from the corporation. The con-

tract surgeon, therefore, has fallen into disrepute, because, on an average, he doesn't measure up to men in civil practice who are doing the best kind of surgery. We have all got to look out for our own welfare, and if we can make more money doing private practice, we are going to do that, in preference to contract practice. The contract surgeon is often careless; he gets a biased view. The claim agent bothers the life out of him to get a man back to work. He sees a few men whom he can't find anything the matter with; I think we have all had experience with that class. Two classes come in that are in absolute disparity to each other. One man says there is nothing the matter with him; the other will come in and say there is something the matter with him, and he will bring medical testimony to substantiate it.

On one railroad we have adopted this policy. We have a great many men who exaggerate their symptoms, but not because they are dishonest, because most men are not dishonest. In ten years of practice, a large part of the time dealing with corporations and their employees, I have found only one man that I thought was an actual malingerer. I have found a good many that exaggerated their symptoms, not because they were dishonest, but because, when a man is injured, he stays around and thinks about his trouble, and he exaggerates his pain because he has nothing else to think about. He has a sore joint and it hurts him when he concentrates on it. These people come into the office and they are inclined to be disgruntled with the company surgeon, anyhow. I call these men off, after I have made a careful examination, and say, "John, I don't think there is half as much the matter with you as you think there is, and I am willing to gamble with you on the subject. I will give you the name of five or ten men in Chicago, men of unimpeachable reputation. I won't address the letter. I will leave the heading blank and say, 'Dear Doctor: This will introduce to you John Smith, who is a patient of mine. I would like to have your opinion upon his condition and will guarantee any fee that you see fit to charge for a thorough examination. Will you please mail the report to me, or hand it to Mr. Smith to bring to me.'" John Smith takes this letter. If he isn't satisfied with one man, I say to him, "Now, if this man says there is nothing the matter with you, will you agree to go back to work? If he says there is something the matter with you, I will agree to pay the bill," The company gives me the privilege of spending all the money on outside doctors that I see fit. If the man is a malingerer he knows his bluff is called; he can't get out of that; that is a perfectly fair proposition that he can't side-step. Eight out of ten men will say, "Well, doctor, if you think there isn't anything the matter with me I will go back and try it." The other two will go to the man, who is a reputable man, and have their examination and

be convinced, and will go back and try it, and I am proud to say that, in almost ten years connection with two railroads, I have only been on the witness stand three times, and two of those times were on account of passengers—only one with employees. That sort of treatment counts, as far as money is concerned, and money is the only thing, as I say, that counts with the corporation. Until you can get them interested in their men, you have got to hit them through their pocketbooks first, and through their sentiments second.

The weighing of medical testimony as it comes before the industrial board from the men who have examined a case and had it under observation is sometimes a rather difficult thing. We haven't had exactly the experience of the Wisconsin Commission, maybe because Chicago abounds in men who will testify to anything, probably; we have had some bad medical situations in Chicago that we have tried to get rid of. Nevertheless, we have had to deal with men who would come in before the insurance companies or the employers and say that a man was able to go back to work, and just as many men come in for the employee and say that he was disabled for life—an absolute divergence of opinion. You can't expect a layman to weigh that medical testimony that involves a lot of medical terms, and sometimes a man's own ignorance is clothed in many high-sounding medical terms that mean nothing much to him and much less to the layman. If you can put that testimony before a man who is impartial, he can eliminate the wheat from the chaff and give the commission some sort of an idea of what the facts are in the case. We have tried, in Illinois, to put ourselves in a position so that the employers and employees would have enough confidence in the medical department and the industrial commission to eliminate all expert testimony; to send their case to the commission and say, "You tell us how much this thing is worth in dollars and cents."

Here is where the commission has the whip hand over the employer and employee. Many cases are sent in to us where the treatment is not complete. A man may have had an injury to his forearm; he has a limitation of motion in the joint and the elbow and wrist. Maybe he has had a splint clear down to the end of his fingers. That all constitutes part of the injury and a part of the disability. If the employer has employed a doctor who knows no better than to leave a man in a splint from his shoulder to his fingers without taking it off or giving any chance for the joint to move, then the employer should be penalized for employing that sort of physician. They have sent that case to the commission for settlement before the case is complete. The commission has a right to send that case back. Why? Treatment is not complete. The best result has not been obtained and we make the employer continue paying compensation until that treatment is complete. Now, in many cases, you will find

that the employer will say, "We don't know what to do with this case. Our doctors say that the treatment is complete," and then we say to them, "Well, we advise you to get some doctors who know more." With constant repeating of that sort of performance, the employers and the insurance companies are gradually coming to the conclusion that it is a bad practice to send a case in before the treatment is complete and the best result attained, because they simply make it cost themselves a lot more than it otherwise would.

Now, in the hopes of getting some line on them, when I went down to the surgeon general's office a year ago, we started to ask various commissions and various employers what became of their serious accident and of their permanent disability cases; how medical treatment was furnished and what were the results. We couldn't get any information otherwise, as the statistics in this country are worth very little. We would like to be able to talk in dollars and cents to the employer, and to show him the difference saved in compensation by the supplying of expert surgical treatment and poor surgical treatment; and, to that end, I have here a rough surgical report to be filled in by the commission on every case, in order to trace our accident cases down and find out what the dollars and cents saving is per case in certain classes of injuries. The thing reads like this: Location of injury—head, arm, etc.; nature of injury—fracture, sprain, etc.; extent and degree of disability, in per cent, functional and occupational. Now, a man may have a functional disability of 50 per cent; for instance, if he has had a fracture of the forearm and he has 50 per cent of motion in that forearm in this direction (indicating), he has a 50-per cent functional disability, so to speak, because he has half his rotation; but supposing he is working at a job where he has to have his hand in this position (indicating), he hasn't that 50 per cent that he needs, so his occupational disability is considerably more than 50 per cent. It makes a lot of difference in a man's earning capacity. "What kind of medical treatment was administered—washing, salve, dressing, iodine, etc.—to give us an idea of what the man got immediately after he was hurt? How soon was this applied after the accident? How many days, weeks, or months under treatment? By whom furnished—employer, insurer, or employee?" Those questions are asked with the idea of giving us some information. For instance, we have an infection of the hand. We can average the infections of the hand; extent of disability; what length of disability they were; what the percentage of disability was after the injury, and how long the treatment lasted. "Qualifications of doctor in attendance; age, school, number of years in practice; special training; interneship; assistant to surgeons, etc." If we get that information we can say to a company, "Last year

cases treated by men who rate as class A–1 men cost in compensation $350 for certain classes of injuries, on an average. Cases treated by class B men cost $850 per case. The medical treatment paid for class A men cost $75 more per case than the medical treatment paid class B men. Therefore, you have a saving of $400 or $500 per case." That is the only way, I believe, we are ever going to be able to talk to these men; and the only way we can get valuable statistics on the value of decent medical treatment is by every commission in this country following up their cases in this way.

Now, at the bottom of this slip we have a paragraph which takes up the vocational phases of permanent disability or permanent partial disability; previous occupation of injured employee; number of years employed at that occupation; previous vocation and training of employee; is patient able to return to his former occupation; could patient be taught new trade if supplied with opportunity; would employer find a new job for him or teach him a new one at his own plant; attitude of employee—would he take a new job if he got it; would he undergo training for a new job?

That means that the States will have to do in the future what the Army is planning to do for its crippled soldiers. Because a man has lost two legs is no reason why he should be a pauper the rest of his life and dependent upon State charity. The States of this country have got to furnish for their crippled industrial individuals just what the Army is going to furnish the crippled soldier, because it costs every State a large amount of money every year to keep and support the injured man who is out of employment, not because that man isn't capable of doing anything, but because that man isn't capable of learning a new trade without some incentive.

There is a bill before Congress now—House bill No. 12880—which provides for the promotion of vocational rehabilitation of persons disabled in industry and otherwise, and for their return to safe employment. That is a plan that contemplates that the Government will pay dollar for dollar—for every dollar that the State invests in vocational reeducation of industrial accidents the Government will put a dollar to it for that purpose, and the vocational board in Washington will have charge of that work.

We have a plan in Illinois to put the whole régime in a State hospital. I haven't time to explain that, because I have run over my time now. It is an idealistic plan, maybe, but it has got to come, because we have got to supply decent medical and surgical treatment for the industrial cripple as well as for the Army cripple. If we don't we are going to be swamped in this country with our million accidents a year.

SURGICAL TREATMENT TO PREVENT AND MINIMIZE PERMANENT DISABILITIES.

BY FRANCIS D. DONOGHUE, M. D., MEDICAL ADVISER, INDUSTRIAL ACCIDENT BOARD OF MASSACHUSETTS.

A study made by my friend, Carl Hookstadt, under the direction of the Department of Labor ("What Becomes of Men in Industry," MONTHLY LABOR REVIEW, July, 1918), emphasizes the facts that proper surgical treatment could prevent and minimize permanent disabilities and that it is inseparably connected with adequate supervising authority and responsible direction of the injured man as a man.

Our thanks should be due to the Hon. William B. Wilson, Secretary of Labor, who, through Dr. Royal Meeker, has made possible this timely contribution to our knowledge of end results.

Compensation laws have now been in existence in this country for six or seven years and a large mass of experience must teach us many lessons if we have time to take stock. Six years of experience in the administration of workmen's compensation laws must be thoroughly convincing to everyone who has had to do with them that the best kind of medical treatment is the cheapest. This point can not admit of argument.

Getting the treatment to the man or getting the man to the treatment is a thing over which the industrial accident boards do not have sufficient control.

In my own State the treatment is given under the direction of 24 insurance companies, each handling the case in its own particular way, the accident board acting only when bad results have occurred or good results have not been obtained.

In general terms, the speed with which employees may be returned to work in surgical cases will depend upon the men and the system under which such cases are handled. Cases should not be sent to institutions which lack the methods of making proper diagnoses or which lack the surgeons qualified to render the particular treatment; and the accident boards should have the power to regulate the institutions to which these cases are sent.

The system which obtains in Massachusetts of sending cases to the open ward of hospitals endowed or maintained for charitable purposes is not a good one, and the treatment of industrial cases in hospital out-patient departments should not be permitted unless special arrangements are made so that a properly qualified surgeon shall actually carry out the treatment.

To quote you cases to show how men suffer from inadequate medical and hospital services would be to repeat in more or less detail

all I have said since I became medical adviser of the Massachusetts Industrial Accident Board.

As the cases that come to our board are those showing poor results, our viewpoint is apt to be distorted because we do not see the thousands of cases in which adequate service has been rendered, so that the men have been properly restored economically.

Adequate surgical treatment to prevent and minimize permanent disabilities is the same kind of treatment which will minimize the loss resulting from the less serious forms of injuries. The permanent disabilities represented by the amputation of an arm or a leg or by the loss of an eye are evident and occupy attention out of proportion to their relative value in industrial injuries.

Less intrusive upon the eye of a claim adjuster and making a less insistent appeal to the administrators of the compensation acts are injuries to the hand.

Rather than discuss in abstract terms, as I think I have before, the whole surgical field, I am going to take up briefly one group of cases and endeavor to focus your attention upon them. These are cases of injuries to the hand.

My interest has been stimulated by the successful work of Dr. William E. Browne, of Boston, who has in some cases acted as an impartial examiner for the Industrial Accident Board.

Do we fully realize the value of the full capacity of the hand?

Injuries to the hand vary in severity from simple contractures to hands which are clawlike in appearance. The two great causes which result in these deformities are first, sepsis, and secondly, fractures. A great many cases of sepsis occur as the result of too many sutures placed too tightly in some small skin wound. These cases are found most frequently in large relief stations, where young, conscientious, but over-enthusiastic internes strive assiduously for a fine-looking wound. It may seem strange, but nevertheless it is a fact, that out of a very large series of crippled hands a large percentage of them was attributable to faulty application of sutures. Nearly all the skin wounds with which one meets in industrial accidents may be attended to by careful application of perforated adhesive plaster with a sterile dressing and, most important, a splint. On the whole, these cases do better with dry dressings, probably because the subcuticular tissues are made better culture media as a result of long-continued and frequent soaking in various solutions. It has been my experience that, when it is possible, it is best to apply water running from a faucet, both hot and cold, and then to squeeze out the water from the dressing and cover it with a Turkish towel.

A poorly set, a nonrecognized, or a slipped fracture of a metacarpal bone will cause a greater period of disability than a poorly

treated Colle's fracture. The average length of disability from an impacted fracture of the lower end of the radius is six to eight weeks. Why? Because the lower end of the radius is almost a fixed object, and an ordinary flannel bandage will serve at times to give a man a fairly good wrist. This is very well proven by the fact that many men treated with liniment and a flannel bandage for supposed sprain of the wrist get back to work in six to eight weeks' time, although they really had Colle's fracture. On the other hand, the metacarpal bone is a long curved bone with about the same curve in it that we find in the normal femur. On the flexor surface of this bone we find three tendons; on the dorsal surface, one tendon; to these groups of tendons the lumbarical muscles are attached; and lastly the interossei muscles are attached to the metacarpal bone, so that in the palm of the hand there is a complex anatomical situation with its basic principle the metacarpal bone. If the metacarpal bone is improperly set, or not set at all, it throws out of normal working order seven muscles, which in turn cause the other muscles of the hand to remain quiet, in order to avoid pain; and here, with reference to fractures of the metacarpal bone, is the starting point of many crippled hands which require serious and skilled operative interference in order to prevent them becoming permanent disabilities. In the fingers themselves, where compound fractures of the phalanges or simple fractures in poor position are found, interference with the action of the flexor or extensor tendons may result, causing a long-continued disability and, not infrequently, resulting in amputation. It has been my experience that removal through careful dissection of the smaller fragment of a fractured phalange (when in poor nonworking condition) gives the man a working hand much better than any other way. This removal of pieces of fractured phalange must be done without any injury whatsoever to the synovial sheath of the flexor tendon.

There are many rules which one might lay down with reference to the treatment of fractures of the small bones of the hand. But in the treatment of these fractures the one greatest thing to bear in mind is that these bones serve as levers for the movement of the tendons, and that interference with the plane of the bone will cause interference with the movement of the tendons. The greater the disturbance of the bone the greater the disturbance in the tendon; the greater the amount of pain in the hand the longer the man's period of disability.

With reference to the soft tissues as a whole in the forearm and hand it is difficult to say a great deal or to say anything which will mean very much to anybody. For example, if a man has pain in the index finger of his right hand can that pain be due to abnormal position of structures in the little finger of the hand? If a man has

flexor and extensor tendons, which in themselves are all right, why should he not have normal flexion and extension in the distal phalanges of his fingers? This brings up the lumbarical muscles question. A man with a thumb and an index and a little finger can do almost as much with such a hand as a man with all fingers present. When tendons have sloughed in the palm of the hand they may be very well replaced by facia lata and good results may be obtained, but in order to get a good result it is necessary to make a quick and careful dissection of the parts into which the graft is to be placed; and if you place a graft in a finger in an anatomically correct position, making allowances for the movements of the finger and for the amount of contracture in the graft you put in, you will restore the greater percentage of crippled fingers.

Every man is not qualified to operate upon the hand. Surgeons of great experience in abdominal and chest operations or in the treatment of fractures are flat failures when it comes to doing plastic operations upon the hand. These cases are so important that they demand men who are fully qualified in the surgery of the hand itself.

The treatment of the hand is not an orthopedic proposition in the sense that orthopedic surgeons alone should be allowed to treat it. It is a capital problem in major industrial surgery.

I would like to say one word here of the tendency of the orthopedist, who is really a mechanician, to invade the surgical field by means of operations. Orthopedic surgery is still in a state of transition, and perhaps general surgery itself is in a period of transition, many general surgeons coming to know that they are incapable of carrying out long-continued mechanical treatment; on the other hand, the surgical training of the orthopedist is as a rule deficient and their surgical sense is of late development. They have not had experience in surgical clinics and have not been called upon to treat acute surgical emergencies, the results of which have afterwards drifted into their hands. It almost may be said that they lack general surgical diagnostic ability, although extremely keen to sense mechanical conditions that a general surgeon constantly overlooks.

Orthopedic surgeons as a rule have drifted into surgery through the chronic channel, and we should utilize them only in such cases as they have proven their ability to handle properly. The orthopedist has taught the general surgeon much by his perseverance and patience in the nonspectacular problems of neglected surgical cases. Orthopedic surgery during the war has developed wonderfully. Its scope has been materially enlarged and from its vast experience great good may be obtained for our industrial cripples.

Cases should be held under such control that all instructions of the surgeon can be made effective, and when the period of active treatment is over, if the employee does not at once return to work,

there should be a follow-up system to persuade the employee to return.

Right here let me say that one of the greatest factors in prolonging disability is in preparing the mind of the injured workman for his first plunge back into industry.

After a severe injury, if the man goes back to work for one day in a week and is given his compensation for the full week without deduction, and the second week he goes back for two days or three days, finally, at the end of the third or fourth week, he will have reacquired confidence in his own capacity.

Serious injury undoubtedly shakes a man's confidence in his ability to do work until he again finds himself. The longer he is allowed to drift the longer he remains unemployed, the longer he remains away from treatment that will restore him, the further he falls in the economic scale; and as he falls in the economic scale his sense of uncompensated injury may become a fixed idea, so that in addition to the difficulty in remedying a mechanical condition we have to deal with a mental condition no less trying.

The conception of work which most men advised to return to work have is based on previous experience, and they should not be made to feel that they are being forced back to work before they are able to work. To advise a non-English-speaking laborer, whose only occupation has been the labor of the pick and shovel, to take up light work at reduced compensation is absurd. Something more is needed than turning the employee loose with the advice that he should find some light work. He has been working under the watchful eye of the boss, and his idea of work is to keep up with his fellow workmen and produce all that is required every day.

Under a proper system, working in conjunction with the physician, hospital, or educational influence, persuasion may be necessary. It may have to be applied not only to the employee but to the employer, and to the immediate superior of the employee, and, above all, to the insurance adjuster if he does not comprehend the problem and how it should be managed.

Industrial accident boards should be keen to help in the replacement work of the wounded of our great war. We should be alive to the opportunity that is afforded to develop industrial surgeons through the great opportunity of concentrated work.

The improved methods developed for the treatment, cure, and rehabilitation of the crippled in the army of warfare should be made available for the improved handling of the injured or disabled in the army of industry.

Hand in hand with adequate medical and surgical diagnosis and treatment must go a firm, direct, and controlling administrative function.

SHOULD MEDICAL SERVICE BE LIMITED IN COMPENSATION CASES?

BY FREDERIC M. WILLIAMS, COMMISSIONER, CONNECTICUT WORKMEN'S COMPENSATION COMMISSION.

My own opinion is that this question must be answered in the negative. The time has, happily, long since passed when the general policy of compensation legislation requires either apology or justification. The ingenuity of the bar has exhausted itself in efforts to attack the constitutionality of such legislation, either optional or compulsory in character. The question can no longer be considered an open one. The live questions for the consideration of students of the subject are, however, now just as numerous, as intricate, and as important as ever. We must consider: 1st, what are the fundamental objects to be accomplished by such legislation? 2d, what is the best method of attaining the desired results? 3d, what is the fair construction of the particular statute or part of a statute under consideration in a particular case? The last problem is our daily routine.

The main benefit of such a meeting as this is interchange of ideas as to the correct answers to the two preceding questions. From several years of study and practical experience my own conclusions are: (a) The main object to be accomplished is the prevention of industrial accidents. This can never be entirely brought about and, therefore, in practice, our efforts are to make such accidents as few as possible. (b) Given the victim of an industrial accident, the most important factor of the problem is the restoration of such victim to his proper niche in the industrial world with the least possible impairment of earning power. (c) The actual payment of money for incapacity or loss of member, or function, while a vital necessity, is really subordinate to the two fundamental objects.

Assuming these premises to be well founded it necessarily follows that provisions of these statutes commonly spoken of as statutory aid, either medical or surgical, are of prime importance.

Connecticut has, so far as I am aware, the most liberal medical-aid provisions of any of the States. The only other statute with substantially the same features of statutory aid without limit as to time or amount is the Federal statute.

The ideas summarized above are in substance the same as expressed by the writer in two recent cases, Olmsted *v.* Lamphier et al., on

appeal reserved for the advice of the supreme court of errors, and Saddlemire *v.* American Bridge Co., appealed to the superior court. In the Olmstead case the court has just handed down an opinion sustaining the commissioner and dismissing the appeal. In the Saddlemire case the same result has followed; hence the ideas above expressed may be said, in substance, to represent the settled doctrine of Connecticut on this subject.

In the Olmsted case a principal point in issue was as to whether the broad and general provisions of section 7 of our act, "The employer as soon as he has knowledge of any such injury shall provide a competent physician or surgeon to attend the injured employee, and in addition shall furnish such medical and surgical aid or hospital service as such physician or surgeon shall deem reasonable or necessary," includes the price of an artificial leg, made necessary by an injury.

The court held that it did include such leg, saying among other things that the term surgical aid "is not limited to the personal service of the surgeon, but includes all the means and instrumentalities used in surgery which will help effect a cure."

Again the court says, "Our act contemplates the furnishing of all the medical and surgical aid that is reasonable and necessary. The purpose of this provision is to restore the injured employee to a place in our industrial life as soon as possible by the use of all medical and surgical aid and hospital service which the ordinary usages of the modern science of medicine and surgery furnish.

"Humanity and economic necessity in this instance are in harmony in working for the accomplishment of the individual and of the public welfare."

When our act was first passed it had the ordinary provision for statutory aid for a 30-day period, with the usual result—dissatisfaction. An effort was made to increase the period, though probably no one thought at first of more than a 60 or 90 day period. Most injuries are relieved within a less time. When the legislature committee began to consider the proper period it at once saw what every one who will view the problem with an open mind must see, that the logical time to cut off medical or surgical treatment is when the patient no longer needs it.

The result in our State is good. No effort has been made to make any change.

It is probable that payments for statutory aid under our system amount to a little more than the direct compensation payments, and this is quite justifiable on the theory which, as above outlined, maintains in Connecticut.

SHOULD MEDICAL SERVICES BE LIMITED IN COMPENSATION CASES?

BY RAPHAEL LEWY, M. D., CHIEF MEDICAL EXAMINER, NEW YORK STATE INDUSTRIAL COMMISSION.

Medical service should not be limited in any respect in compensation cases, but should be continued until medical or surgical treatment is no longer necessary. A limitation of time may be doing a serious injustice to the claimant, as he may be unable to pay for private medical services after the expiration of the legal time limit, or he will look for the cheapest services, or he will have poor advice in selecting medical treatment, and may perhaps not receive skillful or diligent treatment. Also, there is no accurate or exact way of estimating in advance how long the need for medical services may continue. In a serious or protracted case, complications may occur which will unexpectedly prolong the treatment necessary. Even where the time limit is comparatively long, as 90 days or more, and where, as in some States, provision is made for continuing medical treatment, where notice is given, within a stated period in advance of the expiration of the time limit, it is not always possible to determine whether further treatment will be necessary.

THURSDAY, SEPTEMBER 26—AFTERNOON SESSION.

CHAIRMAN, O. J. FAY, M. D., IOWA.

THE COMPENSATION OF DISABILITY DUE TO PREEXISTING DISEASE, AGGRAVATED OR ACCELERATED BY ACCIDENT OR INJURY.

BY MEYER LISSNER, MEMBER, CALIFORNIA INDUSTRIAL ACCIDENT COMMISSION.

The doctor tells us that our subject may satisfactorily be discussed only through familiarity with certain principles concerned with the relationship of disease to the body.

Primarily the new-born babe is sterile; that is, the skin covering and the mucous lining of the body are free from organisms of all kinds, with perhaps the possible exception of inherited syphilis. Within a few hours of the time of birth this covering and lining of the body becomes the site of myriads of organisms, many of which under favorable conditions may produce body infection. The battle against the germ thus begins almost before the child has opened its eyes, and, in general, it may be said that an individual begins to die at the moment of birth.

Many of the organisms which, under favorable circumstances, met with in the individual host, may produce disease, are found to inhabit the mouth and air passages at practically all times. Ordinarily these organisms are held within certain limits by the normal body functions. They gain admission to the body through different portals and then only when at the portals an opportunity for germ activity is rendered possible through a local or general lowering of the body resistance. An excellent illustration of this activity appears in the ordinary infection of an incised finger. Nearly always a finger heals following injury, by primary union, while occasionally a severe infection results which may not only jeopardize but even terminate the individual's life.

The course of a disease aggravated by trauma is dependent almost altogether upon the ability of the body to manufacture white blood cells (scavengers). It is a fight between these scavengers and the germs. In the event that blood cells are not sent to the site of an injury in sufficient numbers the germs gain the upper hand and pass into the circulatory apparatus of the body.

All this is quoted, not on a basis of personal knowledge, but because the doctor tells us these things and says it is necessary, in considering our subject, to bear them in mind in order to emphasize two

conditions, namely: That infection is possible only when organisms are present and body resistance is below par, the former condition never being wanting, and the latter always possible.

These scientific facts would seem to indicate that the narrow application of the general rule that the employer takes the employee subject to his physical condition at the time he enters the employment has, in many instances, worked grave injustice to the employer, by holding him liable for serious and in many cases total disability due to slight aggravation of preexisting disease. At first the California Commission was inclined to apply the rule strictly against the employer, but latterly it has taken into consideration more fully the circumstance of each case, and in cases of chronic disease, when more than a reasonable period has elapsed during which compensation has been paid, where the injury was comparatively slight and the disease the principal contributing factor to the disability, the commission has ordered compensation payments discontinued.

In the amendment of 1917, which became effective January 1, 1918, this practice of the commission was confirmed and written into the law under the definition of the term "injury," as follows:

> Section 3 (4). The term "injury" as used in this act shall include any injury or disease arising out of the employment. In case of aggravation of any disease existing prior to such injury, compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributed to the injury.

The section of the act just quoted refers generally to the announced subject of this discussion—"The compensation of disability due to preexisting disease, aggravated or accelerated by accident or injury;" but there is another aspect of this problem that must properly be considered at the same time—the aggravation or exacerbation of an injury due to preexisting disease. A latent tuberculosis lighted up and made active by a chest injury is an example of the first class, which comes strictly within the definition of our announced subject; the case of a lesion which is stubborn in healing, due to syphilitic infection, is an example of an injury aggravated or exacerbated by disease.

The more one has to do with the administration of a compensation act, the more one becomes impressed with the fact that while it is easy to lay down a general rule, much latitude must be allowed, and much discretion be exercised in the application of general rules to particular cases; in other words, to a large extent, each case must be decided on the basis of its own particular facts, with the object of doing justice between employer and employee, keeping in mind always the purposes and limitations of compensation statutes; and this observation applies with full force to the class of cases we are now discussing. Two men may die of the same disease, in both cases

death to some extent being superinduced by something done in the course of the employment, and yet in one case compensation be allowed and in the other denied; for example, the California Commission awarded a death benefit in the case of a delivery man who had a long standing aortic aneurysm, and who died of a rupture of the aneurysm caused by unusually heavy lifting and straining. (Draper *v.* Anderson Lore & Co., 1 I. A. C. Dec. 132); while in the case of a roofer who also died from the rupture of an aortic aneurysm, but whose labors required no heavy exertion, the death benefit was denied. (Anderson *v.* De Paoli, 4 I. A. C. Dec. 82.)

But while to a large extent each case must stand on its own bottom, from repeated consideration of the same question there has developed a fairly definite threefold classification of cases arising under our general subject.

I. LATENT DISEASES LIGHTED UP BY INJURY.

In these cases ordinarily the whole disability is compensated, the curable disease charged to the employment, and an award rendered in case of death.

Example: Latent tuberculosis lighted up by severe chest injury.

II. DISABILITY DUE MAINLY TO DISEASE BUT AGGRAVATED BY INJURY.

In these cases compensation is usually given only for the period during which the aggravation of disease may reasonably be attributed to the accident and then terminated.

Example: Chronic osteoarthritis aggravated by slight injury.

III. DISABILITY DUE TO INJURY AND PROLONGED BY PREEXISTING DISEASE.

In these cases treatment of the disease as well as the injury is ordered at the expense of the employer; that is, the employer must treat the disease in order to cure the injury. In exceptional cases where the preexisting disease becomes the chief factor and prevents the cure of the injury, the compensation is sometimes terminated and a permanent disability rating made.

Example: Healing of fracture or wound delayed by syphilitic infection.

The following discussion of decisions of the California Commission will illustrate the application of these principles:

SYPHILIS.

The complication of injuries through syphilitic infection has given the California Commission a good deal of concern.

At first the commission was disposed to deny compensation or terminate liability whenever by Wassermann test, or otherwise, it

was demonstrated that recovery was delayed through syphilitic infection; and insurance carriers were not slow to take advantage of this attitude on the part of the commission, and to urge the termination of disability payments in practically every case where a positive Wassermann could be procured. Later on the commission, upon advice, came to regard it as a rather faulty view to hold syphilitic infection responsible in most of these cases. We were informed on good authority that the bone of the syphilitic, the incised wound, and so forth, usually heal without any evidence of a luetic background; in other words, syphilis is ordinarily not invited by a local site by reason of trauma.

It was several years after it began considering cases complicated by syphilitic infection before the California Commission really found its own mind upon the subject. In May, 1917, the case of Peterson *v.* Bristol Bay Packing Co., 4 I. A. C. Dec. 122, was decided. The applicant was injured July, 1916, by an oven door falling on his knee. The defendants, after giving treatment for several months, petitioned for termination of disability indemnity on the ground that the synovitis was complicated by preexisting syphilis, prolonging the normal period of recovery. It appeared, however, that the syphilitic condition could be cured by appropriate antisyphilitic treatment. The commission denied the petition to terminate disability indemnity and ordered treatment for the syphilis.

In deciding this case the commission said:

> These disorders are so prevalent that if compensation were denied wherever an injury is complicated by so-called "specific" disease, a great many worthy people would be without compensation to tide them over their period of adversity, and, in so far, the law would fail of its purpose to prevent poverty arising out of injury. * * * Compensation is not alone for those who are without spot or blemish but for all who work, and there are thousands working who are afflicted with serious maladies which will complicate any injury they may suffer. Nevertheless, in most instances, their disability is proximately caused by their injury and not by their disease which, without injury to precipitate it, might scarcely have troubled them during the rest of their natural lives. The commission distinguishes, however, between ordinary disability, prolonged by complications with specific diseases, and those more serious disabilities which are proximately caused, not by the injury, but by the specific disease, such as tabes dorsalis or paresis, or spontaneous fracture. In such cases the injuries which may have been suffered were only incidents contributing to, and not the proximate cause of, the disability or death, and therefore in such cases compensation will be allowed only in so far as the injuries did themselves, apart from the specific diseases, cause disability.

About the same time the commission outlined its policy in relation to syphilis in the following circular:

THE POLICY OF THE INDUSTRIAL ACCIDENT COMMISSION IN RELATION TO SYPHILIS.

The policy here outlined is intended to serve as a guide and can not be considered as binding in all cases of syphilitic infection.

After some years of experience, the reading of much medical testimony, and consultation with medical authorities, the commission has reached the following conclusions in relation to syphilitic complications with other injuries.

1. In cases of ordinary fractures, contusions and bruises the existence of a syphilitic infection does not, commonly, complicate the issue at all seriously and does not result in any substantial prolongation of disability. In such cases the complication of syphilitic infection will be ignored.

2. But in cases where the syphilitic infection results in tabes dorsalis or paresis it will be the policy of the commission to limit the liability to such temporary, or other, disability, as would probably have resulted from the injury if there had been no syphilitic infection, and for the reason that the diseases above mentioned are constitutional and never the result of injury, but always consequent upon syphilitic infection.

It is the purpose of this commission to hold the industry responsible for so much of disability as such industry can reasonably be held responsible for, but there is no industry that should be held responsible for tabes dorsalis, paresis or spontaneous fracture of the bone.

DECISIONS.

SPONTANEOUS FRACTURE.

An interesting case, decided in March, 1915, was that of a plasterer who, while ascending a ladder to a scaffolding, accidentally struck the shin of his right leg against a brace, fracturing the tibia, for which he received treatment. About 90 days thereafter, while on crutches, stepping down some marble steps, he came down rather heavily upon the other leg and fractured the tibia of that one. On careful examination it was discovered that he was suffering from syphilis in its tertiary stage. The commission held that it was a case of spantaneous fracture for which industry could in no wise be responsible, and ocmpensation was denied. (Spangler *v.* Philbin, 2 I. A. C. Dec. 170.)

ATROPHY OF OPTIC NERVE.

In the most recent case before the commission involving syphilitic infection, the applicant received a blow in the eye in the course of his employment sufficient to cause some swelling of the lids and redness of the conjunctiva and to cut very slightly the cornea. He suffered great pain, was in bed 10 days and was found to have lost the sight of the eye. Expert medical examination showed that the blindness was due to atrophy of the optic nerve caused by syphilitic infection and tabes dorsalis. The commission held that such part of the disability complained of as was properly attributable to the injury could not have lasted longer than one month, and that the remainder must be charged to the disease for which the industry was not responsible. (R——— *v.* Weed, No. 5461, Aug. 21, 1918.)

GONORRHEA.

The question usually arising under the compensation act is whether a particular case of inflammation of the eye, or of an infected joint, etc., is primarily caused by an injury, or results from gonorrheal infection unaccompanied by trauma.

DECISIONS.

COMPENSATION AWARDED.

A boy was thrown from a bicycle and struck heavily upon his hip. The injury was followed by inflammation and extensive destruction of the bone. It was claimed by the insurance company that the disease was the result of gonorrheal infection which had been contracted some years before and that the alleged trauma played no part in its development. The commission found the proof of the fall to be sufficient and awarded compensation, attributing the disability proximately to the fall. (Laning *v.* U. S. Casualty Co., 3 I. A. C. Dec. 127.)

COMPENSATION DENIED.

A gas fitter bruised his knee while crawling under a house while at work and extensive inflammation set in, resulting in destruction of the knee joint. It was claimed that the inflammation was purely gonorrheal and the commission sustained this position. (Walker *v.* Fidelity & Casualty Co., 2 I. A. C. Dec. 738.)

Compensation was claimed for an inflammation of the eyeball alleged to be due to laceration. The condition was found to be gonorrheal and compensation was denied upon the ground that the inflammation was not sufficiently connected with any injury. (Marvin *v.* New Amsterdam Casualty Co., 2 I. A. C. Dec. 966.)

OSTEOARTHRITIS.

Osteoarthritis following trauma has been a very troublesome problem. There have been many cases where men have been seriously and, in some cases, permanently disabled or crippled through what one would class as a minor injury and which would not ordinarily seriously disable a man over a long period of time. Medical testimony has been to the effect that these people have suffered from osteoarthritis in the spine or other joints for varying periods before the time of injury, and the injury, while not in itself producing the arthritis, has caused the condition to become active and progressive in character. The medical profession has stated that many of these people would finally have become crippled independently of accident. In the large majority of cases, however, a positive opinion as to the

length of time this would have taken has been impossible of formation. Trauma, it is said, may change the course of the disease but no two cases of trauma would produce the same results. For these reasons and others akin to them, it is impracticable, and would be most unjust, to compensate all cases alike, and it is manifestly necessary to exercise judgment on the merits of each case.

The medical director of the Industrial Accident Commission has suggested that cases presenting osteoarthritis and producing disability complicated by trauma shall be divided arbitrarily into three classes.

I. Those in which no symptoms of osteoarthritis are developed in the history of the injured prior to the injury, and which do not show characteristic lesions commonly known to cause osteoarthritis, such as bad teeth, bad tonsils, chronic abscesses, urethritis, etc.

II. Those in which moderate symptoms of osteoarthritis but no crippling had been present before the injury or in which there are conditions present which are known frequently to be the cause of osteoarthritis.

III. Those who were suffering prior to the injury from deformity and disability due to osteoarthritis in an advanced form.

For purposes of compensation the medical director recommends the adoption of the following scale:

(*a*) That cases in class I may be considered as having 25 per cent of disability chargeable to osteoarthritis.

(*b*) Cases in class II may be considered as having 50 per cent of disability chargeable to osteoarthritis.

(*c*) Cases in class III may be considered as having 75 per cent of disability chargeable to osteoarthritis.

According to this scale, 25, 50, and 75 per cent of the compensation would be deducted, depending upon the degree of the previously existing osteoarthritis.

While the recommendation of our medical director has not been formally adopted by the commission, nevertheless in compensating cases complicated by osteoarthritis it has been the policy of the commission to take into consideration the preexisting condition, and to terminate liability at what seems in each case the point where it would be unreasonable to charge the condition then existing to the employment. In some cases this might be within a comparatively short time after the accident, while in others compensation might be allowed for a period of as long as a year or more; and in some cases a permanent disability rating might be made charging against the employer such portion of the disability as would seem to be proper under all of the circumstances.

Decisions.

LATENT OSTEOARTHRITIS PRECIPITATED BY INJURY—COMPENSATION DENIED.

A carpenter fell and strained his sacroiliac and lumbrosacral joint, and he thereafter suffered a disability due in part to traumatic neurosis, and in part to osteoarthritis, the cause of which was latent in his system before the injury and which might have developed at any time but was actually precipitated by the injury. The commission held that the osteoarthritis was not proximately caused by the employment or the injury, and that the applicant was entitled to compensation based upon the disability due to the traumatic neurosis only. (Porter *v.* Morse, 4 I. A. C. Dec. 199.)

In the following cases of arthritis, limited awards of compensation were made:

EXACERBATION THROUGH INFECTION.

An employee, with chronic arthritis of the finger joints and Dupuytren's contraction of the palm, suffered a slight injury to one of his fingers, which became infected. The infection and injury were treated for several weeks and he was restored to his condition prior to the injury. This was held to be the limit of the employer's liability. (Landrath *v.* Mountain Copper Co., 4 I. A. C. Dec. 112.)

EXACERBATION THROUGH SPRAIN.

A piano tuner, while holding a piano on edge, sustained a sprain to his back, hip, and left leg. Notwithstanding pain he continued working for two weeks, after which he was disabled by reason of a condition which was diagnosed as osteoarthritis. At the end of six weeks, this disability had disappeared and he returned to work. The commission found, in effect, that, although the applicant was disabled by exacerbation of a previously existing condition of osteoarthritis, nevertheless, the disability was precipitated by the injury. It was therefore held that the applicant's disability was proximately caused by the injury and he was accordingly awarded compensation for the period of the disability. (Thomas *v.* Eilers, 4 I. A. C. Dec. 212.)

LIGHTING UP OF CHRONIC CONDITION.

Applicant sustained a strain to the back from the slipping of a wrench which he was using underneath a cart. There immediately followed a disabling condition of oesteoarthritis of the spine. The commission found that since no symptoms of the disease had shown themselves previous to the accident, although a chronic arthritis had

probably already begun, and the disability was precipitated by the accident, the accident was the proximate cause of the disability. A continuing award in favor of the applicant was made. However, when the applicant had received compensation for the better part of three years, the commission found that any disability sustained by him after that time was not proximately caused by the injury, and an order was made terminating indemnity payments. (Turner *v.* Santa Cruz, 2 I. A. C. Dec. 917.)

CHRONIC CONDITION, BUT NO PREVIOUS DISABILITY—COMPENSATION IN FULL.

A painter injured his foot through the giving way of a staging on which he was working. The blow caused no fracture, but a disability ensued which was diagnosed as osteoarthritis. The evidence showed that the applicant, who was 63 years old, had had chronic osteoarthritis and arteriosclerosis for a considerable time before the injury, which, however, were causing him no disability prior thereto. The medical testimony showed that the injury set up an inflammation which lighted up the quiescent arthritic condition. The commission held that the whole disability suffered by the applicant was proximately caused by the injury and was compensable. (Williamson *v.* Shell Co., 4 I. A. C. Dec. 222.)

HEART DISEASE.

Many cases are found in which an employee with a previously diseased heart receives an injury, followed shortly by death from heart trouble. In those cases it is usually held that where the death occurs within a reasonably short period of time from the injury, so that it may be said that the shock of the injury caused the final overloading of the heart which brought about its collapse, compensation should be allowed. Where, however, the lapse of time between the injury and death is such that the patient has had opportunity to overcome the immediate shock of the injury, and death from subsequent heart disease occurred about as it would have occurred before long had there been no injury, compensation should be denied.

Difficult questions of fact frequently arise as to whether the heart was in abnormal condition before the injury and whether the breaking down of the heart was effected by the alleged injury.

DECISIONS.

COMPENSATION AWARDED.

Applicant suffered a severe and sudden strain when the entire weight of a 300-pound crate of blackboards was thrown upon him while it was being unloaded from a wagon. He immediately quit

work, and was found to have acute dilatation of the heart. Medical opinion differed as to whether or not applicant had any heart trouble before the accident, but it was definitely established that before the accident he was able to work, play ball, etc., and was to all intents and purposes a well man, and that, if he did have any prior heart weakness, the accident was by far the major factor in causing the disability. Full compensation was therefore granted for the disability. (Welch *v.* Weber, 2 I. A. C. Dec. 681.)

An application for disability indemnity was first brought by the injured man and an application for a death benefit was subsequently brought by the widow. Bolster, while picking cherries, fell a distance of 15 feet, fracturing two ribs. Previous to the accident he had shown some symptoms of heart weakness, such as slight shortness of breath, but his work had not been interfered with. Since the accident his heart trouble had been severe and he had been unable to work. The commission decided that the fall had increased the trouble, that one-third of the trouble should be attributed to the original condition and two-thirds to the fall, and he was given a rating for a permanent partial disability based on this conclusion. A few months thereafter the man died from the heart trouble, and his widow was allowed a death benefit. (Bolster *v.* California Mountain Fruit Co., No. 4923 [not reported].)

COMPENSATION DENIED.

A 69-year-old tailor fell 10 feet downstairs, severely shaking him up and hurting his right knee and spraining his left ankle. He was much perturbed, believing he had narrowly escaped death. He apparently recovered, but nine days after the injury suffered a severe attack of angina pectoris, and died of chronic heart trouble four weeks from the injury. It appeared from the post-mortem examination that the heart was in such a condition that death might have come at any time without the fall. The commission held that the fall might have hastened the death, but that this was not enough to justify charging the employment with an entire death benefit. (Waldman *v.* Hermann, 1 I. A. C. Dec., Part II, 82.)

A man 74 years old, working on the pavement in a street, had his shovel knocked out of his hand by an automobile, the handle striking him in the side and knocking the breath out of him, causing him to sit down to regain his composure before returning to work. He worked ten days, when he became ill, and continued so for about six weeks, when he died. The autopsy showed that he died of adherent pericarditis, and that he had chronic myocarditis; and the evidence was that he died primarily of inanition of a decline of physical powers rendering his system unable to resist the long existing heart

troubles; and that if the accident had any relation at all to the death, it was at most a trivial and inconsequential one, and could not be looked upon as the proximate cause of death. (Farrish *v.* Nugent, 1 I. A. C. Dec., Part II, 98.)

A stevedore, who had previously appeared to be strong and well, was struck in the side by a case of leather while steadying the freight going down into the hold of a vessel, and was knocked onto an automobile near by. He worked on for about three weeks, then because of a bad cold and general weakness went to a physician who found him in a bad state of health with faulty heart action and a fatty tumor. He reached the conclusion that these were caused by the injury sustained and applied for compensation, but the commission held that the slight injury had no causal connection with his trouble, which had been developing and had been brought to his attention by the injury sustained. (Lynn *v.* Pacific Coast S. S. Co. 1 I. A. C. Dec. 635.)

A car repairer on entering defendant's employ was found to have a slight cardiac enlargement. While in their employ he was struck in the abdomen by a timber, which incapacitated him for a few hours only. Later while at work under a car he suffered a severe pain in the abdomen, presumably from a wrench sustained while using a hammer, and about a month afterwards went to a hospital, where the pain and other abdominal symptoms disappeared; but he experienced general debility and shortness of breath, became anemic, showed symptoms of chronic heart lesion, and some months later died. An autopsy showed a serious dilation of the heart, vegetations on the valves, adhesions and an enlargement of the lymphatic glands. There was no evidence of any trauma. The testimony showed that the dilatation which caused the death was predisposed by some systemic disease and that all of his symptoms could be explained by such disease. (Newell *v.* Pacific Electric Railway Co., 3 I. A. C. Dec. 442.)

Applicant while opening a bundle of laundry smelled an offensive gas, became dizzy and faint, and was unable to continue work. Three days afterwards she had an irregular heart, and during the following month had heart murmur and rapid pulse, the symptoms being those of a heart that had been failing for some time; finally there was manifested a mild acute heart failure. Held, that the condition was merely a step in the advancement of a preexisting disease of the heart, possibly precipitated by the exertions in moving the bundles of laundry. (Bennett *v.* San Bernardino Laundry Co., 3 I. A. C. Dec. 229.)

S. C. Bollinger, by the overturning of an automobile, received a Colle's fracture and bruises about the chest. He rode for several hours thereafter and that evening an examination of his heart showed

that compensation of the heart was good. No trouble with the heart appeared until the fourth day, when he suffered an attack of decompensation. He received treatment at a hospital for the heart condition, which steadily improved. On the tenth day after the injury he suddenly died. For some time previous to the accident the deceased had been suffering from endocarditis, and had had several attacks of broken compensation. The autopsy showed that the cause of death was this same heart condition, which is frequently the cause of sudden death, and that death would inevitably have occurred suddenly and might have occurred at any time on slight exertion or without any injury. In view of the seriousness of the preexisting condition and the relative slightness of the injury, a death benefit was denied. (Bollinger *v.* Pacific Chemical Co., 5 I. A. C. Dec. 14.)

ARTERIOSCLEROSIS (INCLUDING CEREBRO HEMORRHAGE).

Arteriosclerosis as a disease, commonly known as hardening of the arteries, is produced either by chronic ailments of various sorts or occurs naturally in later life. As far as known, it is never directly produced by trauma, but may be aggravated by it. Such aggravation consists either in the increase of the symptoms due to the disease, caused by weakening of the body through serious injury, or from a rupture of a hardened artery, particularly in the head, causing cerebro hemorrhage or apoplexy.

Decisions.

COMPENSATION AWARDED.

An employee sustained a fall with a severe sprain of the ankle and recovery was thereafter prolonged by reason of a condition of general arterial disease. The commission awarded compensation for full duration of disability due to the injured ankle without diminution by reason of its prolongation by the disease. (Dabila *v.* Aetna Life Insurance Co., 1 I. A. C. Dec. 239.)

An employee, 63 years of age, employed in an undertaking parlor aided in lifting a 500-pound steel casket and immediately became indisposed. After a few days he was taken seriously ill with paralysis of one side, which the attending physician attributed to a rupture of the blood vessel in the brain caused immediately by the heavy lifting, but ultimately by a condition of arteriosclerosis. Compensation was awarded upon the ground that the lifting was the proximate cause. (Jones *v.* Royal Idemnity Co., 1 I. A. C. Dec. 252.)

A night watchman, 67 years of age, suffering from pyuria and a marked degree of arteriosclerosis, was assaulted by highwaymen and sustained various head injuries which thereafter wholly disabled him from labor, practically rendering him insane. The commission found that the disability was proximately brought about by the injury and awarded compensation. (Frohn *v.* State Compensation Insurance Fund et al., 3 I. A. C. Dec. 274.)

COMPENSATION DENIED.

An employee suffering from a marked degree of arteriosclerosis sustained a slight laceration on his shin, which later became gangrened and necessitated amputation of the leg. The medical testimony showed that where gangrene arises from an infected wound, it develops in the immediate vicinity of the wound, but where the gangrene develops from arteriosclerosis generally, it invariably commences in the toes. As the wound in this case was not infected and the gangrene started in the toes, it was held that the amputation was necessitated solely by natural causes and no compensation was allowed for it. (Brown *v.* State Compensation Insurance Fund, 3 I. A. C. Dec. 190.)

Applicant was removing some packages of stationery, which weighed about 48 pounds each, from a low truck which was standing about two feet from the ground, when he became dizzy, afterwards complained of pain in his head, and feeling sick was taken home and died soon after. The autopsy surgeon testified that the man died of cerebral hemorrhage from rupture of the middle meningeal artery, right side, due to general arteriosclerosis. Award denied. (Mathewson *v.* United Railroads, No. 5442 [not reported].)

VARICOSE VEINS AND ULCERS.

Many workmen suffer from varicose veins, which condition is practically always due to natural causes and not to trauma, and which affects their earning power and exposes them unduly to various sequelæ, such as varicose ulcers, etc. The question has never been presented to the commission of whether varicose veins can be caused by injury. The question usually arises as to whether the employer should be freed from liability for disability following a trauma, where disability is in part due to trauma and in part due to the prior varicose condition. Here our commission has followed the policy of allowing compensation wherever the disability is to a considerable extent attributable to trauma, without regard to the predisposing factor. Where, however, the normal skin has been changed by prior varicose ulcers to a very friable tissue which is likely to break out in ulcers on sustaining the slightest blow or scratch, or

even without any trauma at all, the commission has found the contribution of the later trauma to be so small in proportion to that of the predisposing condition as to warrant a complete denial of compensation.

Decisions.

VARICOSE ULCERS—COMPENSATION ALLOWED.

An employee was hired to work as a laborer, and claimed that certain ulcers from which he had recently been suffering were caused by scratches and abrasions which were received by him while at work. The evidence showed that he had received the abrasions claimed, and that they had ulcerated, but further showed that he was troubled with varicose veins and had other ulcers before in other places. Compensation was awarded as it was not shown that the ulcers in question developed on the site of any prior ulcers. (McMullen *v.* Standard Oil Co., 1 I. A. C. Dec. 169.)

An employee bruised his leg and the bruised area subsequently broke down into an ulcer, the duration of which was greatly extended by a condition of varicose veins. Compensation was allowed for the full period of disability as it was not shown that the varicose condition attributed in any way to the original formation of the ulcers. (Hoffman *v.* Maryland Casualty Co., 2 I. A. C. Dec. 183.)

VARICOSE ULCERS—COMPENSATION DENIED.

The applicant sustained an injury to one leg causing a varicose ulcer. Such ulcers had been repeated and virulent leaving only scar tissue upon the shins of the injured workman, so that the slightest abrasion of the skin, which in a normal person would have amounted to nothing, resulted in protracted and stubborn ulcers. Compensation was denied, as the original injury, in the absence of prior ulcers, would not have lasted beyond the waiting period. (Keen *v.* Western Indemnity Co., 2 I. A. C. Dec. 524.)

VARICOCELE.

A teamster was kicked by one of his horses, receiving a glancing blow in the groin. He was able to return to work within three or four weeks, but claimed an operation for the radical cure of varicocele. The commission found that while ordinarily this condition comes from gradual development, and not by trauma, the circumstances of the injury led it to find in his favor, attributing the condition to the accident. (Mitchell *v.* McNab & Smith, 1 I. A. C. Dec. 116.)

TUBERCULOSIS.

This commission has taken several occasions to emphasize the truth that it was not the intent of the legislature, when it substituted the term "injury" for that of "accident" in amending the act, to transform the law into a sickness insurance scheme. The act affords compensation for injuries, but not for sickness unless proximately caused by injuries.

Compensation is wholly a charge against the employer and the industry which the employer follows, whereas sickness insurance, wherever it obtains, is borne only partially by the employer, and if this commission were to be a party to the transforming of a compensation law into a sickness insurance law, great injustice would result to employers and to the industries in which they are engaged.

The change from the word "accident" to "injury" in the amended law, brings within the purview of such law certain diseases known as occupational or industrial diseases, but tuberculosis has no recognized status as an occupational disease. There are no known occupations, unless it be certain forms of mining or nursing tuberculosis patients, which to any great degree result in inflicting tuberculosis upon those who follow such occupations. This is not saying that tuberculosis may not in certain very exceptional cases be the product of an injury, although it would be extremely difficult, in most cases, affirmatively to establish a proximal connection between an injury and a resulting tubercular condition.

Decisions.

In the following cases of tuberculosis, compensation was allowed:

ACCELERATION THROUGH CHEST INJURY.

Disability from tuberculosis has been compensated by the commission where a chest injury (striking chest on wheel of wagon) caused traumatic pneumonia, which was followed by active tuberculosis which the evidence showed was probably present before but might never have troubled the employee in the absence of the injury. (Huffman *v.* Escondido Rochdale Co., 3 I. A. C. Dec. 207.)

A severe chest blow and the inhalation of acid fumes while recovering from the injury, held to have lighted up a preexisting infection and the whole disability compensable. (Cuthbertson *v.* Hercules Powder Co., No. 5492, June 19, 1918 [not reported].)

ACCELERATION THROUGH STRAIN.

The commission found that strain occurred in holding back sacks of flour from falling as the employee was piling same, which set into activity a pulmonary tuberculosis which theretofore had been in a

condition of quiescence and equilibrium. Applicant reported off, felt badly for four or five days, had a pulmonary hemorrhage, and has been ill with lung trouble ever since. A continuing award was made in favor of applicant. (Botterell *v.* Splivado, No. 3887, June 13, 1917.)

ACCELERATION THROUGH ANESTHETIC.

The employee sustained a hernia for which he underwent an operation in September, 1917. Following the operation, however, he developed pulmonary tuberculosis, which resulted in his death in October, 1917. The evidence showed that the deceased had had a latent tuberculosis, which was lighted up and became active as a result of the ether anesthetic given at the operation and the depression and confinement subsequent thereto. The commission held, on expert testimony, that the tubercular pneumonia which caused death was proximately due to the operation, and that therefore the death was proximately caused by, and arose out of, the employment, and was compensable. (Cox *v.* California Southern Railroad Co., 5 I. A. C. Dec. 10.)

TUBERCULOSIS IN TESTICLE.

Where employee had had no active tuberculosis for three years prior to injury and then a blow on the testicle centralizes the infection there compensation was allowed (Stone *v.* F. L. Smith Co., 3 I. A. C. Dec. 365), but denied under similar circumstances in Benjamin *v.* Pacific, 3 I. A. C. Dec. 419.

In the following cases compensation was denied:

HEMORRHAGE FROM SLIGHT EXERTION.

A deliveryman sustained a hemorrhage from the lungs in cranking an automobile, followed by four weeks' disability. The commission held that cranking caused exertion no more severe than was usual in such act and that the hemorrhage arose from a tuberculous condition of the lungs which was such as to render a hemorrhage possible and likely upon a slight or no exertion; that therefore the hemorrhage and the consequent disability did not arise out of and were not proximately caused by said employment. (Broemmer *v.* People's Baking Co., No. 4799, Jan. 10, 1918.)

ACCELERATION FROM EXPOSURE.

Where an employee, suffering from a cold or grip, was exposed for several days to dampness and receives a slight blow in the back, causing no disability at the time, and four days later suffered a hemor-

rhage of the lungs and was found to be suffering from tuberculosis of considerable standing, it was held that the tuberculosis was not proximately caused by the employment, and an award was denied. (Coates *v.* Elsinore, 3 I. A. C. Dec. 269.)

TUBERCULOSIS OF SPINE.

Compensation was denied where a conductor, in jumping from a train in the usual manner in the course of his employment, precipitates a tuberculous condition of the spine resulting in disabling abscesses. (Agezelow *v.* Mt. Tamalpais etc. Ry., 3 I. A. C. Dec. 169.)

STREET SWEEPER INHALING DUST.

Compensation was denied a street sweeper who had been so engaged for 10 years, and for 2 or 3 years had suffered from asthma, when he was found to have been suffering from tuberculosis of the lungs. It appeared that street sweepers were no more subject to the disease than any other members of the public, and that while the inhalation of street dust might predispose one to the disease, the inhalation of large numbers of the germs would not produce infection. (Lopez *v.* City of San Diego, 3 I. A. C. Dec. 497.)

HOSPITAL ORDERLY.

An emergency hospital orderly who came in contact with tuberculosis patients nearly every day was denied compensation for such disease. (Bloom *v.* City and County of San Francisco, No. 5261, Mar. 29, 1918 [not reported].)

PARTIAL COMPENSATION IN CHRONIC CASE.

The applicant was injured by falling off a hand car, the wheels striking him and rolling him over upon the rails and between the ties, causing severe injury. The medical evidence disclosed the fact that applicant had long been a sufferer from a slow tubercular process in the lung. The commission found that the disability, from which applicant suffered as the result of the accident, terminated about three months thereafter, and that whatever disability existed after that date was caused by a tubercular condition remotely and not proximately referable to the injury and therefore not compensable. (Masich *v.* N. W. P. R. R. Co., 2 I. A. C. Dec. 539.)

PNEUMONIA.

Responsibility for pneumonia presents many different topics. For obvious reasons, it is almost never claimed that a prior pneumonia is accelerated by a subsequent trauma occurring in the course of the

employment. The questions most frequently presented are usually, when pneumonia is said to have a traumatic origin, and when not.

DECISIONS.

In the following cases compensation has been awarded for disability or death produced by pneumonia:

An employee was knocked from a wharf and inhaled salt water into the lungs, causing pneumonia due partly to the irritation of the lungs and partly to alcoholism. (Smith *v.* Pacific Surety Co., 1 I. A. C. Dec. 197.)

Compensation was granted where pneumonia followed an operation for amputation of the finger, being primarily produced by the effect of the anesthetic and the surgical shock. (Favero *v.* City of Richmond, 1 I. A. C. Dec. 225.)

Hypostatic pneumonia resulting from confinement in bed following a fracture. (Majeau *v.* Employers' Liability, 2 I. A. C. Dec. 443.)

Pleuropneumonia followed exposure to stormy weather while being taken from the scene of an accident to a hospital, the original injury being to the hand. (Decormier *v.* Western Indemnity Co., 2 I. A. C. Dec. 756.)

Lobar pneumonia resulted in death 5 days after sustaining a back injury, the employee showing hemorrhage of the lungs a day after the accident and before the pneumonia developed. (Aiello *v.* Fidelity & Casualty Co., 3 I. A. C. Dec. 533.)

Lobar pneumonia developed the day after receipt of a chest injury and was held to have been caused by it. (Cledou *v.* Pacific Casualty Co., 3 I. A. C. Dec. 233.)

In the following cases compensation was denied upon the ground that the alleged trauma was not the proximate cause of the pneumonia:

Deceased died from lobar pneumonia about one month after his injury (hernia) while confined to a hospital following an operation for the cure of his hernia. (Holt *v.* Swayne & Hoyt, 1 I. A. C. Dec. 655.)

Lobar pneumonia developed under such circumstances that it was shown to have been in existence before the alleged trauma. (Dennis *v.* Western Indemnity Co., 3 I. A. C. Dec. 463.)

A dredger man, whose work exposed him to frequent wetting, contracted pneumonia, but no definite exposure was shown to be the cause thereof. (Donnelly *v.* Ocean Accident & Guarantee Co., 3 I. A. C. Dec. 393.)

A stevedore storing frozen meats in a refrigerator room on a ship developed lobar pneumonia, no particular trauma being alleged. (Hoefer *v.* London Guarantee & Accident Co., 3 I. A. C. Dec. 194.)

INTESTINAL DISEASES.

In considering abdominal cases the commission has said: "We think the industry chargeable with the consequences of all accidents growing out of the industry, but it is not properly chargeable with results that have only a coincidental relation to such accidents, and are not proximately caused by them."

It must be admitted that by comparing digests of some of these decisions, the awards of the commission will not always seem to be consistent, but these cases well illustrate the suggestion heretofore made that each of them must be decided on the basis of its own facts.

Decisions.

PERITONITIS FROM RUPTURE OF DUODENAL ULCER.

Where an employee lifted, out of its bed in the ground, a stone weighing 250 pounds, and by reason of the strain sustained a fatal peritonitis due to perforations of a chronic duodenal ulcer, although ultimately the wall of the duodenum might have given way entirely as a result of the ulcerous process, held, the injury and death were proximately caused by the strain sustained in the employment. (White *v.* County of Los Angeles, 3 I. A. C. Dec. 83.)

A teamster was kicked at but not hit by a mule. He had been out of condition for a few days and had complained of stomach trouble and indigestion, but directly after the incident with the mule he was seized with severe pain and forced to quit work, and two days later the symptoms becoming alarming he was taken to a hospital, operated on and found to be suffering from peritonitis caused by perforations of a duodenal ulcer. It was claimed that the perforation was caused by the strain of avoiding the kick of the mule. The commission held that the strain complained of was a mere incident and not the cause of the perforation, which would unquestionably have taken place in the immediate future had there been no unusual strain at all experienced. Compensation was denied. (Allen *v.* Southwestern Surety Insurance Co., 1 I. A. C. Dec. 67.)

An employee, through a strain, sustained a slight perforation of a preexisting duodenal ulcer. He was given hospital treatment and warned that if he left the hospital his condition would probably prove fatal, but that if he would continue treatment he would probably recover. He nevertheless returned to his home and thereafter suffered another perforation which caused peritonitis, from which he died. The commission held that the refusal to continue medical treatment was unreasonable within the meaning of section 16 (*e*) of the act and proximately caused his death, and the defendants were discharged from liability. (Stanway *v.* San Joaquin, 4 I. A. C. Dec. 373.)

RUPTURE OF PANCREATIC CYST.

A laborer fell from a bean cutter and ruptured a pancreatic cyst which he had had for some time, but which medical testimony showed might at some indefinite time have ruptured or might have been absorbed and never ruptured. It was held that, under the rule that the employer took the employee subject to the condition in which he found him, the whole disability was proximately caused by and arose out of the employment. (Rategan *v.* Bates, 4 I. A. C. Dec. 78.)

SEPTICEMIA FROM GALL STONES.

A carpenter fell about four feet upon some sand and was so jarred as to loosen some inflammatory products of a prior attack of gall stones. He died of general septicemia and the commission held that the evidence was insufficient to establish that the fall was the proximate cause of the death. (Lind *v.* Anderson, 4 I. A. C. Dec. 103.)

GASTROINTESTINAL TROUBLE.

A laborer 56 years of age who had for several years done the same kind of work as that which he was doing at the time of his injury sustained a strain which caused no disability at the time, and he continued working for five days and then sustained another similar strain which was followed by a disabling gastrointestinal trouble due to a preexisting abdominal weakness of considerable standing, which would have produced such ailment at any time on the suffering of such strains. It was held that only such disability as was reasonably attributable to the injury was compensable; that such disability could not reasonably be said to extend beyond six months from injury, and an award was made accordingly. (Kibler *v.* State Compensation Ins. Fund, 4 I. A. C. Dec. 361.)

COLITIS.

Infection in the hand, resulting in the serious illness of a street sweeper and lowering his power to resist the lighting up of a dormant colitis, was held to be the proximate cause of death from the latter. Award for full death benefit was made. (Mórais *v.* City of San Jose, 3 I. A. C. Dec. 141.)

HERNIA.

One of my earliest impressions, as an industrial accident commissioner, was that of surprise at the number of cases involving hernia that came up for consideration. At that time, about three years ago, the policy of the commission in hernia cases was quite strict. An applicant had to make out a pretty clear case of no previous trouble or disability before receiving an award. There was a disposition in some

cases, known as "border-line cases," when physicians testified to operative findings indicating a preexisting chronic condition, to hold the employer for the cost of the operation, but refuse compensation during the treatment and recovery. In a recent case the commission decided that when an employer assumed the responsibility of the operation, he had to see the employee through the period of treatment and recovery and pay compensation in full until the employee was able to return to work; and in my opinion this is as it should be. I feel that we are justified in requiring the employer to "fish or cut bait." He may submit the case to the commission if he wishes to deny liability, but if he voluntarily opens a man up he should properly see him through the period of convalescence.

The Policy of the Industrial Accident Commission in Relation to Hernia.

The policy outlined is intended to serve as a guide and can not be considered as binding in all hernia cases.

1. The issue of predisposition to hernia is regarded as unimportant.

2. Any hernia, whether complete or incomplete, resulting from strain or wrench or other industrial injury, is compensable.

3. A chronic hernia, if injured or aggravated by injury, is not ordinarily compensable.

4. An incomplete hernia, that is merely incipient, subsequently completed through an independent injury, will ordinarily be compensable.

5. In hernia cases it is not necessary that the evidence must show an immediate collapse or disability on the part of the injured person. There should, however, be proof of pain or discomfort accompanying the alleged injury sufficient, at least, to cause pause and complaint, with corroboration, if possible.

6. A moderate permanent disability indemnity will be allowed for hernia in those cases where operation for the radical cure of the same is for any reason not advisable and the commission will be disposed to approve any reasonable compromise and settlement between the parties in such cases.

7. In all cases of hernia in which the commission shall find the injury remediable by operation the applicant will be awarded such operation as a part of the medical, surgical, and hospital treatment to which he is entitled to cure and relieve him from the effects of the injury. The expense thereof must be paid by his employer or insurance carrier. If the operation is not offered to the applicant he may secure it, charging the reasonable expense thereof to the employer or insurance carrier. In all such cases the applicant will be denied further compensation if he refuses either to accept or secure operative relief.

NEPHRITIS (BRIGHT'S DISEASE).

In a few cases compensation has been claimed directly for an exacerbation by trauma of preexisting nephritis. Such cases coming before the commission are:

An employee suffering from a mild chronic Bright's disease overheated himself when fighting a fire upon the employer's premises and the disease returned with increased severity. It was held that the resulting disability was mainly due to the preexisting disease and not to the injury, and compensation was denied. (Stenburg *v.* Oliver Salt Co., 3 I. A. C. Dec. 295.)

It was claimed that a laborer in a chemical works sustained an exacerbation due to constant inhaling of sulphuric acid fumes. The commission found that the asthmatic touch was due to this cause but nephritis was not exacerbated thereby. (Costain *v.* Frankfort General Ins. Co., I. A. C. Dec. 334.)

The question most frequently arises as to whether nephritis may be proximately caused by an injury.

An employee suffered a fall from a trestle and was exposed to severe climatic conditions of cold and wet while lying injured before being gotten into a house. He died 10 days later from acute nephritis which under the circumstances the commission found was caused by the injury. (Gale *v.* U. S. Fidelity & Casualty Co., 3 I. A. C. Dec. 363.)

Compensation was denied where acute Bright's disease developed 5 days after the fall, upon the ground that there was no evidence of physical injury to the kidneys at the time of the fall, and that acute Bright's disease is probably never traumatic in origin. (Husvick *v.* Simms & Chandler, 1 I. A. C. Dec. 266.)

A death benefit was awarded where an employee received a blister upon his heel while at work and the blister became infected, causing death. The medical testimony showed that the infection resulted in poisoning the blood stream, culminating in the breaking down of the kidneys. (Sheadon *v.* Red River Lumber Co., 1 I. A. C. Dec. 640.)

LUMBAGO.

In general it may be said that lumbago is a condition occurring from natural causes and not caused by injury. The difficulty usually arises in determining whether a particular employee suffering from a painful back is suffering from lumbago, coming on naturally, or from various traumatic conditions, which might be either sacroiliac slip, bruised muscles, strained ligaments, or osteoarthritis condition of the lower spine.

An employee claimed that he strained his back while at work. It was held that the pain in the back was due to lumbago and not to a

wrench received while at work and compensation was denied. (Gibson *v.* Pacific Casualty Co., 1 I. A. C. Dec. 178.)

DIABETES.

No cases have been found in which it is claimed that an old diabetes was accelerated by a later injury. The question usually presented is whether diabetes can be produced by trauma.

Decisions.

A boiler maker was struck in the abdomen by a piece of iron, incapacitating him for only a few minutes, and about three weeks later was found suffering from tonsilitis and shortly afterwards from diabetes. It was held that the evidence was insufficient to show that the diabetes was produced by injury. (Williams *v.* State Compensation Insurance Fund, 4 I. A. C. Dec. 202.)

An employee was working upon a scaffolding at the time it collapsed, causing him to sustain a heavy fall with a fracture of several ribs and injuries to the head. In subsequent medical examinations a diabetic condition was discovered which it was claimed was caused by the injury. The commission found that such condition was proximately produced by the injury and directed the furnishing of medical treatment for its relief. (Wareham *v.* Royal Indemnity Co., decided Aug. 24, 1918, and not yet reported.)

MENINGITIS.

No case has been found where prior meningitis was accelerated or aggravated by subsequent trauma. The question, which usually is decided in the negative, is whether the disability or death from meningitis may be said to be proximately caused by an injury occurring about the time of the onset.

Decisions.

In the following cases compensation was denied:

An employee sustained the loss of a toe by accident, the wound apparently healing, and some months later suffered a series of boils, the infection of these boils subsequently penetrating the blood stream and causing death from meningitis. Held, the original injury was not established as the proximate cause of the terminal disease and death. (Stephens *v.* Employers' Liability Assurance Corporation, 2 I. A. C. Dec. 178.)

It was held that death from meningitis was not shown to have been caused by injury occurring in the course of and arising out of the employment, where the only evidence was that the deceased in-

advertently scratched a pimple on her face with her finger nail while at work, and that the pimple became infected, causing death from meningitis, there being no evidence to show that she was working in infectious or poisonous materials. (Cannon *v.* Pacific Telephone & Telegraph Co., 3 I. A. C. Dec. 214.)

Where a carpenter fell from a scaffold and injured his back but continued to work for nine months, though complaining of pain, and thereafter was taken ill from cerebrospinal meningitis, the evidence failed to show, in view of the short period of incubation of the germ, that death was due to the fall. (Brown *v.* City of Los Angeles, 3 I. A. C. Dec. 468.)

ANTERIOR POLIOMYELITIS (INFANTILE PARALYSIS).

But one case of this disease appears in our records.

Deceased, a motor truck driver, while lifting a 3,000 pound transformer by means of a crowbar for the purpose of putting rollers under it, suffered a severe pain in his back which he ascribed to wrenching caused by lifting. The pain in the back continued and the following day additional pain developed in his side and abdomen. Shortly afterward he became paralyzed, and died six days after the injury. The autopsy showed no evidence of traumatism in the back, but disclosed conditions of the spine which showed that death was caused by anterior poliomyelitis, and compensation was denied upon the ground that the evidence failed to show any connection between the lifting and the onset or development of the disease. (McIntosh *v.* Royal Indemnity Co., 3 I. A. C. Dec. 178.)

SARCOMA.

Our commission has had to consider an unusually interesting series of cases involving sarcoma, which gave us a great deal of concern and necessitated much reading of learned medical briefs before the commission discovered how little the doctors really knew about the etiology of this truly terrible disease. The commission finally came unanimously to the conclusion that it was justified in holding with those medical authorities who claim that trauma is a causative, or at least predisposing, factor in these cases, and made awards in favor of the applicants in four cases of sarcoma, which curiously enough came before the commission for consideration at about the same time.

DECISIONS.

SARCOMA IN HAND FROM HAMMER BLOW.

A blacksmith struck the back of his left hand with a hammer, and a lump immediately appeared at the site of the blow, which

was thereafter diagnosed as a rapidly growing sarcoma. It appeared that a toy cannon had exploded in the blacksmith's hand several years before, but he had suffered no disability. X-ray pictures taken of the sarcoma revealed the presence therein of particles of metal. The medical testimony was inconclusive as to whether the sarcoma originated at the time of the explosion and then remained in a quiescent state and was lighted up by the blow on the hand, or whether it originated at the time of the blow. Held, that the evidence was sufficient to show by a reasonable preponderance of likelihood that the sarcoma was caused by the blow. Eleven months after the injury the arm was amputated at the shoulder. It is now (September, 1918) a year since the operation and the injured seems to be in good health. (Royal Indemnity Co. *v.* Becker, 4 I. A. C. Dec. 148.)

SARCOMA FROM SLIGHT ANKLE BRUISE.

A salesman bruised his ankle by striking it against the street curb in getting out of an automobile. The ankle immediately swelled and became painful. Twelve days after the accident an incision was made, and X-ray pictures taken showed a condition of sarcoma with rarefaction of the bone. After several operations for the purpose of removing the tumorous growth, about three months after the accident the leg was amputated, but the sarcoma continued to develop, resulting in metastasis which caused death eight months after the accident. Award was made for the full death benefit. (Schneider *v.* Norton Bros., 4 I. A. C. Dec. 332.)

SARCOMA OF CLAVICLE.

An employee, who had worked steadily for years, fell a short distance from a platform on which he was working and struck the point of his left shoulder. A lump appeared on the inner third of the left collar bone, which he claimed he noticed immediately after his injury, and which, five weeks later, was decided by physicians to be a sarcoma of slow progression. Although the medical testimony was both hypothetical and conflicting, it was held that there was a reasonable preponderance of likelihood that the disability due to the sarcoma was proximately caused by the injury, and an award for compensation and necessary medical treatment was made in favor of the applicant. This case was taken to the appellate court and later on to the supreme court and the award affirmed by both higher tribunals. (Villa *v.* Santa Ana Sugar Co., 4 I. A. C. Dec. 147.)

This man fell about 12 feet and struck on his right arm and shoulder; was in the hospital about two months. X-ray plates taken

about two months after the accident showed evidence of sarcoma of the articular surface of scapula neck and acromion process, and outer end of clavicle, all being involved. X-ray plates taken at the time of the injury showed the same to a lesser degree. The arm was amputated at the shoulder. Award made in favor of applicant. (Farley *v.* Hughes, No. 3426, May 24, 1917.)

INSANITY.

To many this is the most fascinating medical question presented in compensation practice and frequently the most obscure. The situation is complicated by the existence of various distinct types of mental derangement, each of which depends upon different principles. In many cases, as in paresis, the distinction between aggravation and preexisting condition and proximate cause of insanity becomes lost, and these two issues become inextricably intermingled. The following cases coming before our commission are classified according to types of insanity:

A. Maniacal Type, Hysterical or Depressive.

An employee lost his finger while working on an oil well, and three days later became mentally deranged, being noisy, maniacal, and manifested hysterical symptoms and other abnormalities. He had been mentally unbalanced five years before for a period of 10 months, but was at the time of the accident normal. There was no prior history of venereal or other constitutional disease. It was held that his insanity was precipitated and proximately caused by his injury, the commission stating as follows in its opinion: "In the case before the commission we see a healthy and apparently a normal workman suddenly suffer an accidental injury which takes him from the ranks of producing labor and renders him helpless, incapable, and a charge upon his family. The chain of events from the instant he was injured to the time he became mentally deranged is unbroken. We can not see and we can not say that any new act intervened originating the applicant's mental condition. The testimony and investigations we have made convince us to the contrary." (Hayes *v.* Standard Oil Co., 1 I. A. C. Dec. 219.)

An employee was present and witnessed an accident which caused the death of two of his fellow employees. He became unbalanced immediately, suffering from mental and emotional shock and excitement. His mental condition was diagnosed as a previous hysteria with maniacal manifestations in the earlier stages, and compensation was allowed. (Reich *v.* City of Imperial, 1 I. A. C. Dec. 337.)

An employee sustained a double hernia due to injury and was later operated upon for its cure. Nine days after, he commenced to show signs of restlessness and nervousness which later developed into a violent mania. He was removed to a State insane hospital and died there about 5 months later. It was claimed that the insanity and subsequent death were caused by the shock of the accident and of the operation or of the anesthetic employed. The preponderance of medical testimony showed that death was probably due to an acute condition contracted in the insane hospital and not directly to the insanity, and further that the lapse of time from the accident and operation to the first manifestation of insane symptoms was such as to prevent the shock of the accident and operation from having upset his mental equilibrium. Compensation was accordingly allowed only for the disability due to the hernia and physical disability following the operation. (Kato *v.* Guardian Casualty Co., 3 I. A. C. Dec. 333.)

B. Paresis.

An employee fell from the top of a straw stack 20 feet to the ground, the fall causing a slight concussion of the brain. He was sent to a hospital for 17 days and then returned to his home. Upon arriving home he complained of paralysis and other symptoms and becoming worse was sent to the hospital for the insane, where his condition was diagnosed as paresis, or general paralysis, this condition being of syphilitic origin. The commission found that the effect of the accident upon his mental balance was not sufficient to constitute the proximate cause of the development of the insanity, and denied compensation except for the immediate physical consequence of the fall. (Hanson *v.* Frankfort General Insurance Co., 2 I. A. C. Dec. 767.)

Applicant, employed as a farm laborer, while driving a team under a projecting roof, struck his head on a rafter and was knocked to the ground. A few days later he began to develop symptoms diagnosed as traumatic neurasthenia. It was also found that he was suffering from syphilitic infection, latent before the injury and probably lighted up thereby. An award was made for a temporary partial disability. Later on it was shown that the physiological and anatomical effects of the injury had totally disappeared, that the then existing symptoms were due entirely to the syphilitic infection and were those of the pseudoneurasthenia complex characteristic of the period antecedent to true leuetic paresis, due entirely to the syphilitic infection and not to the injury. The defendants were accordingly discharged. (Christensen *v.* Bravender, 3 I. A. C. Dec. 527.)

C. Traumatic Insanity.

This class of cases occurs where an employee has sustained a head injury, principally where the skull is fractured, causing damage to the brain which produces insanity. In this case the right to compensation is clear if the medical testimony sufficiently connects the damage with the mental derangement.

A laundry-wagon driver was kicked by his horse, sustaining a fractured skull. He was unconscious for several weeks afterwards and slowly recovered, returning to work in about three months. Nearly a year after his accident he had seizures of some sort, probably epileptic, although he had never been subject to epileptic fits or seizures before the accident. For some time before the seizures he had noted occasional dizzy spells and during the remainder of his life, which was nearly a year after the first seizure, he had other seizures of less violence. During the last few months his intelligence became affected and he was unable to continue at work. His case was diagnosed by several neurologists as one of major hysteria and traumatic neurosis, without any organic brain injury, but one expert neurologist gave it as his opinion that the employee was suffering from definite brain injury, traumatic epilepsy, and the probable beginning of dementia. The employee died from acute appendicitis, and upon autopsy, necrosed portions of the brain were found sufficient to account for his symptoms. The commission allowed temporary total indemnity up to the time of his death, terminating compensation at that time as the death was not due to the injury. (Baldwin *v.* Western Indemnity Co., Sept. 14, 1917 [not reported].)

A lineman in the employment of an electrical railway company fell from the top of a line wagon to the street, fracturing his skull. He remained unconscious for a time and later was able to be about. X-ray examination about six months later showed a pronounced thickening of the inner table of the skull, about certain sutures. He complained principally, after the immediate effects of the accident had subsided, of sleeplessness and occasional violent outburst of temper without apparent reason, maniacal spells, but not sufficiently definite to enable the condition to be classed as a maniacal or depressive type. He also had a suggestion of petit mal epilepsy. Compensation was awarded for insanity produced by a head injury and concussion of the brain. Some time after the award the employee was committed to the insane hospital. (Stultz *v.* Oakland San Francisco Terminal Railways, Mar. 12, 1918 [not reported].)

DISLOCATED SEMILUNAR CARTILAGE.

There is a certain type of knee injury, known as a dislocated semilunar cartilage, whose recurrent effects cause embarrassment

to industrial accident boards. The first time trouble is noted by the injured employee is usually when he strains his knee suddenly, causing a dislocation of this cartilage, impinging in the knee joint, and causing severe pain and disability for some weeks. Thereafter the disability will gradually pass away and he will return to work, but forever afterwards, unless operated upon, he remains subject to a recurrence. Any slight strain thereafter will cause a new dislocation of the weakened joint, and indeed such dislocation is even found to occur at recurrent intervals without any trauma whatsoever. Each time the cartilage slips again disability will be produced for some days or weeks.

With respect to the first occurrence, if produced by trauma, the case is clear. The problem arises with later displacements, particularly where the man is working for other employers. Should the second displacement be charged to the new employer, or are all subsequent displacements proximately a result of the original weakening of the joint and to be charged to the first employer, or should the employee go uncompensated for later displacements?

Our commission in the cases of Raggio *v.* Royal Indemnity Co., 3 I. A. C. Dec. 319, Employers' Liability Assurance Corporation *v.* Raggio, 3 I. A. C. Dec. 324, and Salyer *v.* Sperry Flour Co., 3 I. A. C. Dec. 321, laid down the following tests:

(1) The employer in whose service the first dislocation of the knee cartilage occurs is liable for compensation for the temporary condition produced.

(2) The employer in whose employment a second dislocation of the cartilage occurs, without evidence of specific trauma at the time, is not liable for any disability ensuing, as the condition is merely a recurrence of the fact of the first dislocation.

(3) Where evidence of trauma at the time of the second slipping of the cartilage is clear and convincing, compensation will be awarded against the second employer, but only in such cases.

(4) The only cure for the situation is an operation, but such operation should not, by reason of the dangers attending it, be forced upon the injured employee as a condition precedent to receiving compensation for his injury. The expense of the operation should be borne by the first employer.

(5) Where an operation is advised by competent surgeons, the first employer should be required to tender it, leaving the injured man free to elect whether or not to submit himself to it. If he declines the operation, the employer should be discharged from all further liability after the immediate temporary disability is passed and not be held liable for future recurrences.

DISEASES AND INDUSTRIAL INJURIES.

Following is an analysis of the commission's disposition of claims arising out of 118 cases of diseases and industrial injuries, from January 1, 1917, to June 30, 1918:

Diseases.	Claims granted by commission.	Claims denied by commission.	Statute of limitations interfered.	Remarks.
Anthrax	1			
Apoplexy		2		Not due to employment.
Appendicitis		1		Insufficient evidence to establish claim.
Arteriosclerosis		1		Not in course of employment.
Arthritis	15			
Do		1		Not due to employment.
Carcinoma		2		Not in course of employment nor result of injury.
Gonorrhea		2		Not result of injury.
Heart trouble	2			
Do		7		Not due to employment.
Hemorrhoids	2			
Hernia of appendix	1			
Hydrocele		1		Not caused by employment.
Meningitis		1		Do.
Orchitis	1			
Paralysis	3			
Do		2		Not due to employment.
Pneumonia	4			
Do		6		Insufficient evidence and not result of injury.
Rheumatism	3			Do.
Do		9		
Sarcoma	4		1	
Sacroiliac slip	6			
Syphilis	5			
Do		7		Not due to employment.
Tenosynovitis	1		1	
Tuberculosis	10		1	
Do		10		Not due to injury or employment.
Varicocele	2			
Do		1		Evidence insufficient.
Varicose ulcer		1		Disability not result of injury.
Varicose veins		1		Do.
Total	60	55	3	

HOW MEDICAL QUESTIONS ARE HANDLED UNDER THE WORKMEN'S COMPENSATION ACT IN THE STATE OF WASHINGTON.

BY J. W. BRISLAWN, INDUSTRIAL INSURANCE COMMISSIONER OF WASHINGTON.

Medical problems arising under the Washington plan of workmen's compensation are handled through the medical department of the Industrial Insurance Commission. The Industrial Insurance Commission, which administers the workmen's compensation act, consists of three members appointed by the governor. The medical department of the Industrial Insurance Commission consists of a chief medical adviser and an assistant medical adviser, appointed by the commission, who devote all of their time to the work.

Under our law each claim for compensation is based on three reports to the commission: (1) The workman's claim; (2) the employer's report; (3) the report of the attending physician. Every physician in the State of Washington attending an injured workman is required to make a report of the case to the industrial insurance commission. Blank forms for this report are furnished every regularly licensed physician in the State. The rules of the commission require the attending physician to make the report within a reasonable time. Thus each practicing physician who gives medical attention to injured workmen becomes in a sense an assistant to the medical department of the commission. The attending physician may be called upon by the commission, or its medical department, for other and additional information than that required in the first report. The attending physician is required to report the condition of the injured workman during each month of his disability. In every case the report of the attending physician is submitted to our medical department for approval or rejection of the claim from a medical point of view. The action of the medical department is not final and conclusive so far as the fate of a particular claim is concerned, but is always subject to final action by the commission. In border line cases, where the medical profession is in doubt as to whether or not the claimant's condition has resulted from his injury, the commission is prone to give the benefit of the doubt to the claimant.

Special medical examiners are appointed by the commission to examine such claimants as are too far distant from the office of the commission at Olympia to make it possible for them to report there

for special examination. Specialists in nervous diseases, eye and ear specialists, and specialists in bone work are appointed by the commission from time to time to examine such claimants as we are unable to have examined by our own department, or whose cases require a more thorough examination than the ordinary practitioner is prepared to make. Wasserman reactions and tuberculin tests are made for the commission in the laboratory maintained by the State Department of Public Health. We may also appoint a special examiner outside of the State to examine any claimant who has removed from our State before his case has been finally closed. When we find an examiner who writes a good special report, and whose findings are reasonably reliable, we try to use him in all our cases in his locality, for the reason that this means uniformity in the handling of cases, and after having done this work for us for some time he usually becomes more skilled and gives us more definite information on which to rate the cases.

Under the law, as amended by the legislature of 1917, the commission pays the traveling expenses of any claimant ordered up for special medical examination. This enables us to bring many more claimants to our Olympia office for examination than heretofore and has resulted in much more satisfactory settlements in difficult or disputed cases than it was possible to make prior to the amendment of the law. This has greatly increased the work of our medical department but the results amply justify the increased labor.

As an adjunct to our medical department we have two or three claim adjusters who have been trained for the work but who are not physicians. These men cover the entire State and meet the claimants at convenient places, settling such claims as can be settled without special medical examination. Their reports—adjustments—are forwarded to the medical department of the commission and either approved for final settlement of the claim or the claimant is then ordered to appear before a physician for medical examination.

Prior to 1917 the Industrial Insurance Commission was charged with the duty of supervising the medical and hospital treatment of injured workmen, to the extent of seeing that such treatment was suitable and wholesome. In 1917 the law was amended, and there was created a State medical aid department, of which the chief medical adviser of the Industrial Insurance Commission was made, ex officio, a member and chairman of the board; two other members, one an employer and the other a representative of labor, were to be appointed by the governor. This board, known as the "State medical aid board" is now charged with the duty of supervising medical and hospital treatment of injured workmen.

The medical aid act provides two plans under which injured workmen may receive medical and hospital treatment, the first being

known as the "State plan," under which plan funds contributed by the workmen and the employers of the State are paid into the State medical aid fund; the workman chooses his own physician and his own hospital; the employer furnishes transportation for the injured workman to the place of treatment, and the medical bills, hospital bills, and drug bills are paid out of the State fund upon approval of such bills by the State medical aid board certified to the industrial insurance commission, which commission orders the payments made. The other plan provided is the "contract plan" under which the employer, with the consent of not less than 50 per cent of his workmen, may enter into a contract for medical and hospital care of such men as are injured, in which case only 10 per cent of the amount paid by the workmen and the employed so contracting is paid into the State medical aid fund, the remaining 90 per cent being paid to the doctor or hospital holding such contract. In either case, however, whether under the State plan or the contract plan, the State medical aid board has supervision of the treatment. This ties the whole subject of medical and hospital treatment of injured workmen to the medical department of the industrial insurance commission.

The Industrial Insurance Commission has the power, under the law, to prescribe rules and regulations concerning reports of physicians and to require claimants to submit to medical examinations from time to time, and in conjunction with the medical aid board, to determine whether or not the treatment that injured workmen are receiving is suitable and wholesome. It is enabled to do this to its own satisfaction and to the benefit of the injured workman by reason of having constantly the services of its medical department. Acting under the advice of its medical adviser the commission adopted rules concerning hernia cases. Under the hernia rules if an operation is advisable and will relieve the condition, the commission orders the operation. If the claimant refuses to be operated on all payments are suspended until he does submit to an operation. The same is true concerning operations for almost any industrial injury where relief may be obtained by a reasonable operation.

While new problems are constantly occurring it is worthy of note that hundreds of injuries are similar in character, will yield to similar treatment, and will result in about the same degree of temporary or permanent disability, as the case may be. Careful observation of such cases by our medical department enables us to determine a reasonable duration of time loss and to rate such disabilities as result from like cases in a reasonably uniform manner. We find many injuries occurring that are not classified in the act and that result in no definite permanent partial disability, such as when an amputation follows an injury. I refer to such injuries as fractures of the skull where no operation is required or where a depression of the outer

table may occur. Where the final outcome is doubtful we endeavor to rate such resulting disabilities in the light of the experience that the department has had and in conformity with a uniform schedule.

It might be proper to say that under the Washington act, as administered by the commission, we attempt to settle our medical problems according to the best medical advice that we can obtain. We believe that by having the services of our own medical men, supplemented by such further advice and consultation as they desire, or as the commission may require, we get fairly uniform results and administer the law as equitably between the injured workman and the employer who pays the bills as it is possible to do.

It should be remembered, however, that many of the injured workmen are never seen by our chief medical adviser, or his assistant, and, therefore, their skill and knowledge of such matters is put to the most severe test in determining the condition of the claimant and the degree of his disability from the report of attending physician or special examiner. We feel, however, that this can be determined more accurately by having a department working in conjunction with the Industrial Insurance Commission than it could be if we were solely dependent upon the attending physician or special examiner for medical advice in each case.

HOW MEDICAL QUESTIONS ARE HANDLED UNDER COMPENSATION ACT IN MASSACHUSETTS.

BY WILLIAM W. KENNARD, CHAIRMAN, MASSACHUSETTS INDUSTRIAL ACCIDENT BOARD.

The compensation act of Massachusetts, Part V, section 9, provides that the Industrial Accident Board may appoint a medical adviser. This act went into effect in 1914, since which time the office of medical adviser to our board has been most ably and efficiently filled by Dr. Francis D. Donoghue, of Boston. In his department are handled in the first instance the medical questions which arise in any given case. Under our act, "After an employee has received an injury, and from time to time thereafter during the continuance of his disability he shall, if so requested by the association or subscriber, submit himself to an examination by a physician or surgeon authorized to practice medicine under the laws of the Commonwealth, furnished and paid for by the association or subscriber. The employee shall have the right to have a physician provided and paid for by himself present at the examination. If he refuses to submit himself for the examination, or in any way obstructs the same, his right to compensation shall be suspended, and his compensation during the period of suspension may be forfeited."

Under another section of the act it is provided that "The Industrial Accident Board or any member thereof may appoint a duly qualified impartial physician to examine the injured employee and to report. The fee for this service shall be $5 and traveling expenses, but the board may allow additional reasonable amounts in extraordinary cases, and the association shall reimburse the board for the amount so paid. The report of the physician shall be admissible as evidence in any proceeding before the Industrial Accident Board or a committee of arbitration, provided that the employee and insurer have seasonably been furnished with copies thereof."

In practice the Industrial Accident Board of Massachusetts avails itself, in almost every disputed case, of the provisions of the latter section; that is, an impartial examination is made and an impartial reports is filed. This may be done as a result of a conference; it may be done as a result of the suggestion of the medical adviser in consultation with the member of the board who has had to do with the case; it may be done during a conference or hearing, or if the result of a conference or hearing is such that in the opinion of the sitting

member he will be aided and assisted in a just determination of the question before him by a report from some impartial examiner.

In all other respects medical questions which come before the board are handled as in a court of law. Both parties, the employee and the insurer, can present at the hearing the testimony of attending physicians, hospital records, or experts, and such evidence is received in the same way and manner as all other evidence having to do with the proving or disproving of the claimant's case. In practice, as may be imagined, the report of an impartial examiner is entitled to and receives great weight in the ordinary case. The impartial examiner is chosen, and the case sent to him because he is a specialist in the particular line of work which is presented by the particular case which he examines. These impartial physicians have been picked out with the advice of, and after consultation with, our medical department, in various parts of the Commonwealth. Their reports, as are indicated by the statute, are made in writing along certain prescribed lines tending to best meet the needs of a hearing. In many cases it is deemed advisable on the part of the sitting member, or more often by one of the parties, to submit both the written report and the oral testimony of the impartial examiner. In the latter case the party desiring his presence makes a request of our board, and the impartial examiner, if it is the judgment of the board that such evidence is properly asked for, is then requested through the medical department to be present at the hearing. At this time he is subject to examination by either of the parties on matters pertinent to the case. At no stage of the proceedings, up to the time he takes the witness stand, is the impartial examiner permitted to be interrogated by either party to the controversy, it being the purpose of the act, which purpose we believe has been accomplished, to make him all that the term "impartial" implies.

In addition to the impartial physicians located throughout the State, each day there is in attendance at the board rooms a physician who can be, and is, called upon to examine cases informally for guidance in conference matters, and formally with a written report to be used for hearing purposes. As will be noted, from the statute, the expense of the impartial physician, both for examination and testifying, is made a charge against the insurer, but his fee is not paid direct by the insurer, but an account is rendered by our medical department to the insurer which pays the money into the Commonwealth and the Commonwealth, through the treasurer's department, disburses it in accordance with the accounts rendered to him by our medical department. Since December 1, 1917, the beginning of our fiscal year, to September 1, 1918, a period of 10 months, there has been so paid for impartial examinations the sum of $13,889.62, an average of about $1,550 a month.

It should perhaps be stated at this point, if it should not have come earlier in these remarks, that when the parties are not able to get together themselves, or at an informal conference, that under the Massachusetts law, a formal hearing is held, at which both parties are ordinarily represented by counsel, and testimony is taken and received in accordance with regular court procedure and also in accordance with the ordinary rules of evidence prevailing in any court trial, with the result that some cases will run for two or three days, the time being given up entirely to medical testimony from various experts presented by both parties. The provision of the statute quoted with reference to examination of the injured man by the insurer, makes it possible for the insurer to go fully into the medical side of the case with his experts. The employee, generally unable to pay the expense of high priced expert testimony, is, through the system of impartial examination, amply protected in his rights, the impartial examiner being, as before stated, a man especially skilled with the problems of the particular class of cases of which the subject case is a part, and ordinarily a man who, by reason of that fact, is amply able to present his views upon the witness stand when called upon to do so.

I haven't attempted in these few remarks to go into the question of medical treatment and all the other aspects of the medical problem, having in mind, upon an examination of the program, that to do so would be going beyond the scope of our question, encroaching upon the ground which will be covered by other papers.

HOW MEDICAL QUESTIONS ARE HANDLED UNDER COMPENSATION LAW IN NEW YORK STATE.

BY WILLIAM C. ARCHER, DEPUTY COMMISSIONER IN CHARGE OF NEW YORK STATE BUREAU OF WORKMEN'S COMPENSATION.

What are medical questions?

Does the question refer to the organization of the medical division within the bureau or department? Or does it refer to the selection of physicians and the method of treatment with such attendant questions as who shall provide the treatment, etc.? Or does it refer in a larger sense to the relation of the medical question to the whole matter of workmen's compensation? These all stand up in plain view when the subject of these remarks is announced.

But the program of this session when read with the entire medical program would seem to limit the medical question to the first reference above and I may say perhaps the least interesting.

In the New York jurisdiction there is a large claims office in New York City to which is attached the principal office of the medical division and where is stationed our chief medical examiner. There are also claims offices in four other cities. In New York there is the equivalent of 12 full daily sessions a week engaged in hearing claims. In the other cities there is one full day's hearing a week with numerous other cases heard on notice. Each of these latter cities is also the center of a circuit which is visited periodically by deputy commissioners who hear cases. Each of the latter at each place of hearing has available medical advice.

The medical division is in charge of a chief medical examiner whose duties embrace the following: To examine claimants; to be present at hearings where medical testimony is taken, either as an examiner of medical witnesses, as medical counsel to the sitting commissioners, or as witness whose opinions are subject to cross-examination; to review cases and to make written reports on the medical phases thereof; to be present at conferences of physicians in the examination of claimants; and to outline and control the work of his medical and clerical staff.

With never-ending hearings the medical office in New York City is a busy place; for, as soon as it appears to the sitting commissioner that a medical report is desirable, the proceedings are interrupted and the claimant is sent at once to the medical division for an examination. In the course of a few minutes the case is returned with a complete report, whereupon it is again called and disposed of.

That this is an advantageous arrangement goes without saying. It enables us quickly to dispose of a large number of cases and greatly to diminish the time consumed in the disposition of the case. It also permits of numerous adjournments in a given case and the ability of the bureau to follow it from week to week or month to month, keeping in close and accurate touch with it. Of course, it is recognized that a large city and cheap transportation make this possible. But the practice in effect is quite the same in the smaller cities where an available physician is always at hand. There is also the element of impartiality, which is recognized by all parties, our medical division being guided only by a sense of truth and justice and not interested for or against either claimant or insurance company. Of course, primary requisites on the part of the medical division are ability and fairness.

In New York City alone 15,000 examinations were made last year. This gives an idea of the amount of work done. Every report is recorded and made easy of access through a card system of filing. A copy of the report is also filed with the other papers in the case and thus made easily accessible to the claim examiners or sitting commissioner. In New York, besides the cases which are noticed for public hearing, there are many cases in which compensation is paid and received by employers and claimants and which are certified to the commission on joint reports of agreements. The law requires that these agreements shall provide full statutory compensation and makes it a duty of the commission to investigate the cases to see that agreements have been made strictly according to law. To aid in this investigation, notices are sent to claimants to present themselves for medical examination if they lack knowledge of the terms of the law or for any other reason they are doubtful that they have received adequate compensation. This brings thousands of claimants to the office of the commission and most of them go through the medical division, where they are examined and reported on in the manner outlined above. This safeguards the enforcement of the provisions of the law and again demonstrates the utility of a well organized medical division.

It is also the function of the medical division to make arrangements for all specialists' examinations such as neurologists, oculists, etc. The insurance carriers invariably pay for such examinations but the examiner is selected by the medical division independent of the knowledge of any party in interest.

This, in brief, is the manner in which medical questions are handled in New York.

There are a number of great problems in compensation matters such as extent of coverage, manner of insurance, benefits, rates, ad-

ministration, including problems of organization and finality in the disposition of claims, accident prevention, and the medical question. The last has its relative importance, which is always large. Injured workmen should have voluntary recourse to a clinic of undoubted skill and ability; they should be induced by every proper incentive to submit themselves immediately after injury to adequate treatment; their cases should immediately come under the attention of the State, and be held there until a permanent determination of the disability is arrived at; they should have this medical attention without cost to them other than the great underlying cost whose prominent share they are indirectly paying. The State should also be able to command directly the testimony of the physicians under a plan in which the physicians would not be tempted to be witnesses except for the truth.

In addition to this, the administrative commission should have at its command a thoroughly equipped staff of physicians, and in this connection it is safe to say that every State in the Union should have at its service a larger staff than it is now able to command. The physicians composing the staff should be of such well recognized ability that they might well be the final arbiters of all medical questions raised.

So much, in brief, on a phase of the compensation question without limit in importance or interest.

THE NEED OF MEDICAL STATISTICS FOR COMPENSATION PURPOSES.

BY F. H. THOMPSON, M. D., CHIEF MEDICAL EXAMINER, OREGON INDUSTRIAL ACCIDENT COMMISSION.

No compensation board has a complete organization without a statistical department, as such information as is gained from the gathering and presentation of statistical data is essential for effective service. Compensation statistics have two important functions:

First, such statistics give definite information as to the method of treatment offering the most uniform success to the industrial surgeon. For instance, it has been shown that in ununited fractures autogenous bone graft causes early union with no latent aftereffects, the least amount of callus (in excess), and no later operation, such as is the case with the use of plates, nails, etc., which must be removed. Femur fractures vary according to location, character, and extent of soft tissue trauma. Only by reviewing the records of hundreds of cases has treatment of this bone been so perfected that the injured workman can have the benefit of real scientific care, with the expectation that the ultimate result will be satisfactory and the amount of shortening the minimum. The insuring to an injured workman of the best surgical care is made possible only by carefully compiled statistics, from a study of which adequate conclusions can be drawn.

As regards the care of wounds or any other abnormal condition, statistics are just as valuable. To-day a palmar or tendonitis abcess would not be poulticed and allowed to "head" while infection was traveling up the arm, doing irreparable damage and menacing life. The infected area would be drained at such a point as would leave the least disability from scar tissue formation and adhesions.

Real surgical science has, like every other science, grown by slow process of profiting by mistakes and of perfecting technique along lines that have proven successful. Case histories, which are statistics of the best sort, have been kept—the only means by which progress is possible.

Second, statistical computation enables the accident board to arrive more accurately at the relative hazard of any occupation. This is of the utmost importance in properly estimating liability, fixing adequate rates to cover the hazard, and estimating the proper time

loss. It is especially important as to the fixing of rates, as it would be obviously unfair to have one arbitrary rate that would apply to all types of hazardous work. It would be impossible to arrive at an equitable rate without knowing the hazard of the particular industry, which can be ascertained only from accurate statistics.

It has been found that the accident experience of steel-ship yards is greater in frequency, but less in severity, than in wooden-ship yards, and that it is higher in logging than in commercial transfer work. So by proper compilation of actual accident experience accident boards are enabled to arrive at definite, equitable rates for the various industries and at the same time to so grade the rate as to cover the liability of the hazard.

This one point should be borne in mind, however, that in studying statistics for the estimation of time loss due to any given type of accident, the model averages are the averages ordinarily made and should be the standard. For instance, in nine cases of fracture of the tibia one case may be unusually severe and give a disability period of nine months; one may be slight, with a temporary total time loss of one month; five may last practically three months; one may last four months, and one five months. Evidently for these figures three is the mode, and should be taken as the ordinary time loss in estimating liability, instead of the average secured by adding and by dividing by the number of cases, which would give $3\frac{7}{9}$ months time loss per case, a period which would be too long.

For these reasons statistics are vitally necessary for industrial, surgical, and compensation purposes.

THURSDAY, SEPTEMBER 26—EVENING SESSION.

CHAIRMAN, F. D. DONOGHUE, M. D., MASSACHUSETTS.

SELECTION OF THE PHYSICIAN UNDER COMPENSATION LAWS.

BY JOHN W. MOWELL, M. D., MEDICAL ADVISER TO THE INDUSTRIAL INSURANCE COMMISSION OF THE STATE OF WASHINGTON AND CHAIRMAN OF THE STATE MEDICAL AID BOARD.

The selection of a physician under compensation laws depends largely upon the law itself; so what I have to say will be from the standpoint of the compensation law of the State of Washington and it resolves itself into the following:

First. The free choice of physician by the injured workman.

Second. The selection of a physician by the employer, after securing the consent of his workmen to contract for their care.

Third. The selection of the physician for special work, by the industrial insurance commission through the medical aid board.

Under what is known in our State as the "State plan" the law grants the workman the privilege of selecting his own physician in case of injury, provided he resides within a reasonable distance from the injured workman. While this plan seems quite equitable and it appears to be the natural thing to do, it has a good many shortcomings. For instance, to the isolated workman who is employed in a locality where there are only one or two physicians, free choice means little, and the injured workman has to accept the services of the first physician he can obtain. However, in the larger cities where there is a great number of physicians we find that some of the workmen make a wise choice, while quite a large per cent of them, for some reason or other, select a physician who is not very well equipped for the work at hand.

We often find that a workman who has received a serious fracture will select a physician who knows little about fractures; also a man who receives an injury to his eyes may go to an ordinary practitioner for treatment until the serious nature of the case makes it necessary to transfer him to an eye specialist, whom he should have consulted in the first instance. This occurs more or less with reference to all kinds of injuries. We have seen numerous times, and once within the last month, a workman who had received a Colle's fracture, that had never been badly displaced, but had been treated by a long anterior and posterior splint extending over the fingers. The splints

were retained two months. This man was past middle age, and not only his arm but his entire hand was so disabled that it was practically useless, due not to the fracture but to the manner in which it was handled. His condition is such that he will have a practically useless arm and hand the rest of his life.

We have also seen numerous Pott's fractures that were treated by physicians who were not well up in handling this particular fracture, and did not appreciate the final results that are so apt to follow. The claimants are disabled from lack of proper alignment and left in a seriously crippled condition.

Since surgeons learn largely from experience in handling these cases, the surgeon who handles few may entirely fail to appreciate the condition that he is dealing with and trust too much to chance, and after it is too late to remedy the condition he finds that he has been quite shortsighted.

To my mind the principal thing that can be said in favor of free choice of physician by the injured workman is the effect that it has on his mind, that is, the feeling that he is getting what he wants.

Under the contract plan we have a good deal of the same conditions to contend with, since in isolated districts it is impossible to keep a physician in the locality under the "Free choice plan," so some physician, and very often the man with very little experience, locates in the district and contracts with the employer for the care of his workmen, on a monthly payment basis, so that he may be able to maintain himself in that location. He proceeds to handle everything that may follow, to the misfortune of the workmen, and gets his experience, sometimes, at the expense of the workmen and employer. If he is a close observer his work will improve, as it is largely along one line.

In the larger industrial centers some of the contract men are very efficient "business getters" and obtain their contracts largely from enterprise in that direction. They must, however, give service equal to any that can be given in the district, or they are not able to retain their contracts. This they do either by becoming quite efficient themselves or by associating themselves with some surgeon who is well equipped to do the work. The medical aid board also has this check with reference to contract work, that it must be satisfied that the surgeon who is taking the contract is able to give the men as good service as they can get in that locality. The same rule holds good in the isolated districts.

There is one unfortunate feature of the contract plan that has given and is at present giving the State medical aid board considerable trouble. It is the commercializing of the contract plan by nonmedical men who form a hospital association and then go to the employer

and employees and by offering them some special inducement get the signatures of the workmen, giving their consent to the employer to make a contract for their care. Then they secure the services of a surgeon and pay a small part of the proceeds to him for the work and keep the remainder. This has brought about a lot of dissatisfaction among the workmen and the physicians of the State, causing some agitation at the present time toward State hospitals for the care of workmen under the industrial act.

Under the head of "Selection of surgeon for special work," the medical aid board requires, by rule, that where a contracting surgeon is not able to do the work personally he must furnish the services of a specialist.

Under free choice of physician the medical aid board, by rule, reserves the right to transfer a man for treatment to a surgeon of its choice where it becomes evident that the injured workman is not receiving the service that he should at the hands of the physician of his choice. In making this selection the board is guided entirely by its knowledge of the various kinds of work that the different surgeons of the State are best fitted to do. This knowledge is based on seven years' observation of the work done by the physicians in the State.

In conclusion, I would like to say that for the ordinary accident I feel that the workman should have "free choice of physician," but in more serious accidents it would be much better if he would take the advice of some one who is in a position to know what physician is best equipped by experience or otherwise to treat the particular condition from which he is suffering. In this way the permanent partial disabilities resulting would be fewer and the injured man would be left in better shape to take up a gainful occupation, for the disability awards, although as liberal as under any compensation act, are not in keeping with what the workman loses.

SELECTION OF THE PHYSICIAN IN COMPENSATION CASES.

BY RAPHAEL LEWY, M. D., CHIEF MEDICAL EXAMINER, NEW YORK STATE INDUSTRIAL COMMISSION.

[This paper was submitted but not read.]

The selection of the physician to treat workmen's compensation cases is a problem of some moment, and one that must be regarded from various points of view. It is obvious, at the outset, that the selection of the physician by either party—the claimant or the insurance carrier—is accompanied by both advantages and disadvantages. If the physician is selected by the insurance carrier, it may be presumed that the carrier is in a position to select a skilled attendant, who will give the claimant adequate care, but it must also be remembered that the carrier is vitally interested in shortening the period of disability as greatly as possible. This may sometimes result in disadvantage to the injured person, as he may be pronounced cured or beyond need of further attention, or beyond the possibility of further improvement, when he still honestly believes himself to be suffering or not entirely cured.

If the selection of the physician is left to the injured person, it must be remembered that there is the advantage that the claimant is more likely to experience mental satisfaction by having his own way. There is also the element of so-called confidence in the physician of his choice. If he selects his own family physician, however, the doctor may not be specially qualified to treat injuries or complicated surgical sequelæ, or if the claimant selects some one else, he may not be properly guided by good advice in his selection, and his own experience in such matters is necessarily limited. There is also the element of human nature to be taken into consideration that treatment may sometimes be unnecessarily prolonged, or that the physician may tend to magnify the claimant's case.

Even if we assume, as we should, that the claimant will honestly select a competent physician who will adequately treat him and relieve him of his suffering and injury at the earliest possible moment, it should be understood that the commission shall have the power to refer the claimant to another physician for more competent or specialized treatment when it is apparent to the commission that the claimant is no longer receiving skillful or careful treatment.

The ideal plan would be to leave the choice in the hands of neither carrier nor claimant, but entirely in the discretion of the compensation commission, at the recommendation of the medical department. This plan may be presumed to be impartial, fair to both parties, entirely disinterested, and to result, as a general rule, in the selection of competent medical assistance.

FRIDAY, SEPTEMBER 27—MORNING SESSION.

CHAIRMAN, FRED M. WILCOX, PRESIDENT, I. A. I. A. B. C.

V. REHABILITATION.

HOW TO DEAL WITH CRIPPLED WORKERS.

BY T. NORMAN DEAN, STATISTICIAN, WORKMEN'S COMPENSATION BOARD OF ONTARIO.

Terms, especially when used in major premises, require somewhat careful definition. Wherefore, the following: A "worker" is one who functions in society according as he uses the full measure of his physical and mental capabilities; when he has lost some part of those capacities he becomes a cripple. The distinction between a handicapped and a crippled worker is that the handicapped man has lost either actual or potential power, while the cripple has lost only actual power—something which he already possessed. The limitation thus placed in defining crippled workers so operates as to set apart those whose power of social functioning has been lessened by purely exogenous forces. These forces are disease, war, and accidents, accidents being easily divisible into those the result of the public hazard and those the result of industrial employment. Cripples also readily divide into two main groups: Those who are able to pursue their former occupations and those who are unable to do so. This is perhaps the true measure of incapacity from the social side, for if a cripple can engage in his prior occupation and successfully meet the competition of nondisabled workers he is able to produce as much or nearly as much as formerly.

It does not seem possible to hazard an estimate of the number of cripples, irrespective of cause, in the United States, yet to convey concretely the magnitude of the problem an attempt has been made to deduce, conservatively, the number of industrial cripples. Without delineating the bases and various assumptions made, or the intricacies of statistical calculation, the figure, shorn bald of all qualifications, is 2,122,000, of whom 600,000 have been so incapacitated as to be rendered occupationally useless.

In philosophic definitions of the State and its functions and of democracy from the Politicus of Aristotle to the decision of the United States Supreme Court in Chisholm *v.* Georgia, throughout the labyrinth of metaphysical content, there runs the silver cord of national weal and individual well-being.

Every citizen is, as it were, a part of the great economic machine of his country. If he is an efficient part he is adding to the national wealth and maintaining the social prosperity; if he fails in his efficiency he is a dead weight that the rest of the Nation must carry and hence lessens instead of increasing the public resources. The subtraction of the producing capacity of half a million or so cripples is not all; there is a further incubus on the Nation of uncrippled producers maintaining the crippled nonproducers. In a time of national stress, when all productive elements and agencies needs must be marshalled, the power of half a million is not inconsiderable. Furthermore, when the reconstruction of peace inevitably follows the destruction of war there is an accentuated loss from war cripples.

The loss of wages, and of what wages will buy in necessities, comfort, and satisfaction, inactivity, moral as well as industrial, cheerlessness and hopelessness of outlook and physical and mental suffering of the cripple and changed conditions of his dependents, are not conducive to individual well-being.

The pleas for the adequate care of war cripples are not specious arguments. Yet it would require an army of over 43,000,000 continuously in contact with the enemy for a year, or of four millions for ten years, to produce the number of industrial cripples, unable to engage in their former occupations, alive at this instant in the United States alone. Then apart from pure sentimentalism, if war cripples as cripples form a national problem how much more manifest is the problem of industrial cripples. Measured in national terms, the question of military cripples is dwarfed by the immensity of the question of industrial cripples, and measured in individual terms, the number of industrial cripples is to the number of war cripples as the sands of the seashore are to the ships that sail the depths, for the future holds vistas of industrial progress of inconceivable magnitude and of the total obliteration and elimination of warfare. War, in its terrible intensity has galvanized a materialistic world into some consideration for human wastage. Even the unspeakable Turk and the unutterable Hun have been touched. Albeit the "Beast that walks like a man" has naught else than Hohenzollern aggrandizement and Prussian megalomania as his propelling motives. The broken wrecks returning from abroad have stirred the laggard national heart to the pulsating beats of democracy. The call of heroic dead comes sharp and clear.

> To you with falling hands we throw the torch—
> Be yours to hold it high.
> If ye break faith with us who die,
> We shall not sleep though poppies grow
> In Flanders fields.

The torch of democracy—individual well-being and national weal.

The problem, then, is the restoration of the producing and earning power of cripples. The measure of national weal is the producing power of the citizens; the measure of individual well-being is, in fact if not in theory, the individual's earning power; the one is the natural concomitant of the other.

The social movement specifically designated as conservation has its appropriate place in the economic calendar. Conservation is the development of natural resources for the future, natural resources consisting of passive resources such as land, minerals, fisheries, and waterpowers, and of one active force, industrial man power, the only agency through which passive resources can be transposed into usable product. With conservation runs its twin brother, reclamation—the utilizing of waste. With all of the passive resources and with practically every product manufactured therefrom has come the utilization of waste. But the waste dumps of industry still contain the cripples of industry "unwept, unhonored, and unsung." Rehabilitation is the reclamation of cripples—the converting of the now useless cripples into producers, thereby subserving the national weal and individual well-being.

That rehabilitation is possible no longer implies consideration of theoretical probabilities. The experience of Canada with war cripples shows that it has been possible successfully to widen the field of industrial reemployment to 176 different trades and occupations without exhausting as yet all the opportunities. The net result is that up to June 30, 1918, 4,612 soldiers so disabled as to require reeducation had been approved for courses of vocational treatment. Even before the war such schools as those at Charleroi, Brussels, and Tournai were doing excellent work with excellent results. Since war's advent the belligerent nations have earnestly and diligently prosecuted endeavor and the results have been astounding. In Canada, one man with both legs off and one eye out has been taught silver polishing, soldering, and gilding, and is in receipt of a wage of $75 monthly.

Canada is tending her war-disabled from clearing station to his last hospital better than the wounded soldier has ever been tended in any war. In special hospitals—orthopedic, phthisic, neurasthenic, blind—the medical branch of the Department of Soldiers' Civil Reestablishment is restoring the torn flesh, solidifying nerve and lung, and ameliorating other bodily and mental conditions, as well as the most modern science can effect it. An earned sympathy and humanity enwraps the man who fought. The department's dietary branch feeds him as no soldier was fed before, the commandant's branch provides the means for smoothing his personal difficulties; the accounts branch plays its necessary part; whilst the vocational branch

retains him if, by reason of his wounds, there is no return possible to the way he made his living before enlisting.

Scientific rehabilitation, as the result of war experience, connotes adequate medical care, proper prothesis, functional reeducation, vocational training, and system for employment—these form the physical side; and, from the mental side, understanding of psychothenia, sympathetic counseling, patience, and tolerance. It follows as a matter of course that in order to achieve the ends of rehabilitation a system of pay or allowance must be provided for the cripples and their dependents. The necessary adaptations of these methods to industrial cripples constitutes the patent answer to the question, "How to deal with crippled workers."

The jurisdictional differences must be noted. Under present systems or under present laws, it is impossible for a compensation board to exercise mandatory control of the patient from time of injury. It is possible, however, to eliminate the inefficient and unscrupulous medical practitioners. Nor is it possible to require a patient to submit to occupational therapy, but it is possible in large industrial centers to make arrangements with hospitals so that occupational therapy be made a part of hospital regimen.

The first thing necessary to a plan of rehabilitating industrial cripples is the appointment of a vocational officer, a man of broad sympathies and good judgment, one conversant alike with industrial processes and human nature. On notification of an accident likely to result in serious permanent disability this officer should, if possible, interview the injured man and his dependents, to provide proper hospital accommodation and a living allowance for maintenance of family, so that the fear of want could be eliminated from the mind of the patient, for it is the actual fear of want, of subsequent incapacitation and industrial uselessness that engenders psychothenia, the poison that creeps into the mind suddenly shocked by injury and then allowed to stagnate through long and forced idleness, and psychothenia, even as neurosis, often disables more than injury itself. Any business or financial worries settled on the mind of the patient should be dissipated by sound advice so that surgical recovery can be hastened. The patient should be visited often, his prior occupational record should be studied, and his employer canvassed for suitable employment. The thought that any service rendered is with the ultimate idea of reducing compensation should not be allowed to germinate. When convalescing time comes, a start should be made toward suggesting new avenues of employment necessitated by injury; that he can be self-supporting, that his power to work can be restored should be the thoughts dominant in the patient's mind—this by the power of suggestion. Naturally the

man's desires should be consulted but he should be impressed gently but firmly with the fact that he must compete with nondisabled workers and so piloted into a sensible and practical occupation. He should be advised further as to the most suitable type of artificial appliance. Employers within the jurisdiction should be canvassed for suitable opportunities. It is more than a belief that there is suitable employment for every disabled man provided he be not insane and that he retains some useful faculty. In point of fact, experience and such meager statistical data as are available demonstrate this a fact. The actual introduction to the new trade should be in the shop or existent institutions for rehabilitation and reeducation. If fitted, the man should receive further education—in night schools, social service classes, technical schools or business colleges. Finally, when placed he should be further encouraged to "carry on" and sympathetic tolerance should overbear his vagaries.

It is manifest that pay and allowances would be necessary. These could be deducted from compensation without too greatly reducing the amount and without fear of overpayment.

Objections can be urged, it is true, against such a plan, that it is academic in scope, paternalistic in conception, and socialistic in execution, that men will not submit, that employers will not provide employment, that the trade-unions would object, that it would cost too much, that it is not practical.

Whether it be paternalistic, idealistic, socialistic, or academic is beside the point. The fundamental thing is that there is a problem, that that problem requires solution, that it can be solved, and that it can be solved only by action. All the writings or talkings can not restore one cripple to service unless there be action. That the employers will hire these men is a proved fact. Even as a matter of business, if a cripple can compete and the employer, through compensation, has already paid him a part of wages, surely in return for 100 per cent labor he is willing to pay a minimum of wages up to a reasonable amount. That men will not submit is not shown to be true by war experience, and even if some of the wastage can be reclaimed something is done. Trade-unions will not object if they understand the fundamental conception of rehabilitation, for to do so would defeat some of their own ends. The cost of the scheme is not overwhelming—the services of one or at most two officers and the incidental postage, office, and traveling expenses—for the number of cripples in any one jurisdiction in any one year is small.

In last analysis the argument against action in restoring cripples to industrial usefulness, in view of the necessity to provide for the added risk by reason of prior disability, is untenable. In the case of jurisdictions which refuse permanent total disability compensation to a substandard workman who has his remaining earning

capacity seriously impaired or wiped out in the accident under consideration, the conclusion can not be supported by the premises. A careful calculation for a jurisdiction which provides for total disability regardless of whether that disability was incurred in the present or in a previous accident shows that the average rate per hundred of pay roll would be increased by less than one-third of 1 cent in order to meet the added burden necessitated through a humane consideration of facts.

Furthermore, with Canada's four years of war cripples back in the country, the problem of prior disability in relation to subsequent compensation has not become acute nor pressing to the Ontario compensation board. Pennsylvania has a record of 42,111 employment openings in that State for its soldiers, sailors, and marines who may return disabled by war service, and it is understood no question of increased compensation liability has become apparent.

A year ago it was urged that action in regard to industrial cripples be taken. It was pointed out that the present system of pensioning was inadequate and highly artificial, that the whole economic theory of workmen's compensation called for rehabilitation, that pensioning instead of being the only thing to be done was but the last of five equally important things. In the year since elapsed some 30,000 industrial cripples have been thrown on the Nation. To-day the problem and its solution are left, with the thought of the old tent-maker—

> The moving Finger writes, and, having writ,
> Moves on, nor all your Piety nor Wit
> Shall lure it back to cancel half a line,
> Nor all your Tears wash out a Word of it.

CONSERVATION OF MAN POWER AND REHABILITATION OF THE INDUSTRIALLY DISABLED.

BY LIEUT. COL. HARRY E. MOCK, M. C.

[This paper was submitted but not read.]

Our Nation, following the example of the other warring nations, has adopted a plan to physically reconstruct, functionally reeducate, and completely rehabilitate all of her disabled soldiers. Congress in June, 1917, pledged this service by passing the War Risk Insurance Act. The necessity of conserving our man power as well as the debt which the Nation will owe these disabled soldiers makes such a program obligatory.

By physical reconstruction is meant the continued and complete medical and surgical treatment until the greatest possible restoration of the disabled parts has been secured.

Functional reeducation consists of various methods to restore function in a disabled part, or to train other members to new work, or to teach the amputated cases the use of artificial members. In other words, it is combining with our surgical procedure, which aim at his physical repair, certain other therapeutic measures which will help the patient to functionally overcome his handicap.

These reeducational methods are:

1. Physiotherapy—massage, hydrotherapy, mechanical appliances, gymnastics, games, etc.

2. Bedside occupations and, later, work in the curative workshops—so-called occupational therapy.

3. Mental training—individual and classroom work. This has a psychotherapeutic value.

Rehabilitation, or the refitting of the man to an independent economic position in society, consists of measures which are neither medical nor surgical, but which can often begin during the course of his medical treatment.

Thus the work of rehabilitation laps over into the hospital treatment and in many cases continues for an indefinite time after the work of the medical officers has been completed.

In the majority of cases the functional reeducation, especially the occupational therapy, can be made so practicable that it will dovetail in with the rehabilitation work.

Therefore, while a portion of this work must be conducted while the man is under military control, and a portion must be carried on after the man becomes a civilian, yet, as far as the man himself is

concerned, it will be a gradual, unbroken reclamation to a useful life whatever his handicap may be.

These are the plans for the disabled soldiers from the Army. But no concrete, definite program has yet been conceived for the disabled from the industrial army.

During the last decade a new specialty has developed in the medical profession dealing with the human maintenance in industry. This does not refer to the old-time company physician whose chief, and often only, duty consisted of emergency treatment for the injured. Rather industrial medicine and surgery includes everything necessary for the complete supervision of the health of the working force.

Human maintenance in industry consists in applying the general principles of medicine and surgery to a large group of people as a unit. While individuals receive special medical or surgical care whenever needed, yet the chief purpose of this specialty is prevention. Prevention of disease or accidents among the entire group of employees; prevention of undue loss of time when injury or disease assails an employee; prevention of deformities and permanent disabilities; prevention of inefficiency on the job when traceable to some physical condition. In fact, the prevention of everything which would tend to undermine the physical or mental welfare of the workers.

In order to accomplish this many of our largest industries have developed a staff of capable physicians and surgeons who spend part, or all, of their time at the plant. Here, by being on the job—in the front-line trench of industry—they are not only in the strategic position to study and apply every phase of prevention, but also to render immediate and proper medical and surgical care to every sick or injured employee, which after all is only another form of prevention.

We have succeeded in having this comprehensive system of industrial medicine and surgery adopted by many of our larger employers. To-day approximately one-tenth of the workers of our Nation are receiving the benefits, to a more or less degree, of this system. There still remains, however, many more large concerns, the small employer, the householder with his domestic help, the farmer with his hired men, and many others who have not considered it a duty to safeguard the health and welfare of those working for them.

When we consider that 40,000,000 people in the United States are engaged in gainful occupations, we can then comprehend what the adoption of a Nation-wide program of disease and accident prevention would mean to the economic existence of our country.

But in spite of all our prevention methods we have, and will continue to have, the disabled employee in our midst. The man who

is no longer able to continue at heavy work because of a damaged heart or circulatory apparatus; the man who develops tuberculosis, and, even though cured, is afraid to or advised against returning to his former work, or is rejected from one job after another because of his damaged lung; the epileptic who, to safeguard the concern against possible compensation, is fired as soon as his condition is known; the men with hernias, with flat feet, and many other anatomical conditions that make them inefficient; as well as the armless and legless and others seriously handicapped, the result of injuries; all make up our army of disabled men. Every year adds to the total of incompetents who on account of disease or accidents are prematurely thrown into the scrap heap because their handicap prevents them from continuing at their old occupations.

A few industries have salvaged these disabled and made them efficient and independent. Some industries have given their disabled employees easy jobs where they could make a living. But the very softness of the job robbed them of all incentive, and the bitterness engendered from dying ambition added to their incompetency, so that many of these drifted on into the scrap heap. Other concerns settled with their disabled workman, when they were legally responsible, and then dismissed him. Their disabled for whom they were morally but not legally responsible were scrapped without a settlement.

These men, trained for certain occupations, who meet with permanent handicaps, are the waste products of our industrial life. Too often when reemployed they are ineffective because they are thrown into the job without considering their physical fitness for it. Again, they are given the positions of watchman, flagman, messengers, porters, and the like when, with proper training, their full mental energy and remaining physical capacities could make them highly efficient in much more useful vocations.

The most unfortunate group of these disabled are those who cease to be employed by the concern responsible for their disability. Other employers are not interested in them—do not feel responsible for them. They drift from one job to another, constantly dropping into a lower scale, until finally they relinquish all effort to work. These make up the loafers, the beggar on the corner, the shoe-string merchant on the street, the poor physically handicapped and mentally debased flotsam and jetsam of our civilization.

The great lesson, therefore, which industrial medicine and surgery can learn from the plans of the Medical Department of the Army to reclaim the disabled soldier is the complete rehabilitation of the disabled from the industrial army.

These handicapped soldiers from industry must not only be physically cured, but they must be retrained for new work when their

disability prevents return to the old job; they must be given suitable employment in a position that affords them equal income and the opportunity for initiative and advancement; adequate compensation must be paid them for disabilities directly the result of occupation, without derogatory reaction upon their future opportunities; and proper supervision must be maintained over them to see that their rehabilitation is completed and so remains.

To-day, as a result of our plans for the reclaiming of the war disabled, the nation is awakening to its responsibility toward the civilian disabled.

There is every reason to believe that before long Congress will enact a law for the vocational rehabilitation of the industrially disabled just as it is now meeting the same question for the disabled soldier.

It is conceded that the industries of the country are as essential to the winning of the war as the military army. Many of these industries, producing and transporting materials necessary to maintaining our fighting forces, belong to the Federal Government. Others are controlled by the Government. Still others are civilian. These have built up a vast industrial army, many of whose men are exempted from draft because they are needed in this branch of the service. It has even been suggested that it may become necessary to conscript labor for this army.

Production and other work in many of these industries is slowed up, due to (*a*) insanitary working conditions; (*b*) insanitary living conditions; (*c*) failure to select men for proper work—especially from a physical standpoint; (*d*) inadequate medical and surgical care; (*e*) failure to provide disease and accident prevention; (*f*) great labor turnover, resulting from many of the above conditions; (*g*) many accidents occur, the result of employing green hands and of speeding up.

As a war measure the Government must make every unit of this industrial army as efficient as possible. The health of these men is of primary importance in accomplishing this. Some medical force of the Federal Government must take up this work. As this is a military measure some existing governmental medical department is the logical force to carry on such a human conservation policy, in those industries directly operated for military production.

The duties of the governmental medical officers assigned to these military industries should be: (*a*) To establish plant dispensaries. (*b*) To give immediate medical and surgical care. This would save lives and many subsequent complications and deformities. (*c*) To examine all applicants for work. 1. To protect the old forces from contagious diseases. 2. To prevent men with disabilities from being placed at work where they could not be efficient—thus to prevent

premature breakdown. 3. To provide physical selection of men and women for work. (*d*) To supervise health of workers by medical examinations. (*e*) To establish plant sanitation. (*f*) To establish house sanitation. (*g*) To provide for all kinds of disease and accident prevention.

In Government controlled industries and civilian industries carrying on any type of military work this governmental medical department could assign medical officers at once to act as health inspectors. A precedent is established by certain departments of the Army in that inspectors are assigned to inspect the products of an industry—as inspectors of shells in munition plants. Also, a medical officer has been assigned to shipbuilding industries for this work at request of the Secretary of War.

The duties of these inspectors would be: (*a*) Inspect plants for insanitary conditions tending to slow up production, and report on same. (*b*) Use influence to have these industries establish the above health policy by using civilian doctors. This could be forced by the Government by including certain clauses in contracts, by commandeering methods, etc.

Comprehensive plans for the reconstruction and otherwise reclaiming of the war disabled are being developed by the Federal Government. Since the industrial army is equally serving the country this reclamation work should be extended to include the disabled from these military industries. Hundreds are being disabled every day. Therefore reconstruction hospitals should be established at once and work on the reclaiming of the disabled from the industrial army begun at once. Man power is at such a premium now that this policy is essential to the winning of the war. Federal and State governments should be held responsible for reclaiming their disabled.

Also this reclamation work should be extended to those rejected because of disabilities from both the military and the industrial army. At present these are being thrown back into society as a discard without the Government taking proper steps to reclaim this man power so badly needed. It is an economic waste which an efficient war policy demands should be conserved.

Man power will win this war, man power at the front over there, and man power in the great industrial army—the second line of defense—over here. As a Nation we are united in one great purpose—our determination to win this war. Our every motive must be toward this end.

Therefore every effort expended for the conservation of human life and the reclamation of all human energy, in both the military and industrial armies, will be of the greatest aid in achieving this victory.

PROBLEM OF THE CRIPPLED MAN IN INDUSTRY.

BY CARL HOOKSTADT, EXPERT, UNITED STATES BUREAU OF LABOR STATISTICS.

The purposes of this article are to outline the actual industrial problem, as disclosed by several intensive investigations, confronting workmen permanently injured in industry; to analyze the causes of the various factors entering into the problem; and to offer certain remedial suggestions. The statements are based chiefly upon a study of industrial cripples in Massachusetts, supplemented by similar investigations in California, Wisconsin, New York City, and Denmark. The facts show the actual economic consequences of permanent disabilities under normal industrial conditions.

THE PROBLEM.

The economic problems resulting from permanent disabilities are indicated by (1) length of time totally disabled; (2) change of occupation and of employer; (3) number unemployed; (4) reduction in wages and earning capacity; (5) relative severity of various types of injuries in different occupations and industries; and (6) the adequacy of present statutory compensation benefits as compared with probable loss of earning capacity.

Period of total disability.—The period of total disability resulting from the loss of limbs is shown by the following table. Loss of a member, as hereinafter used, means loss of use or impairment of functions, as well as loss by severance or amputation.

PERIOD OF TOTAL DISABILITY RESULTING FROM LOSS OF LIMB, BY TYPE OF INJURY.

Type of injury.	Average period of total disability in months.		Per cent of cases causing total disability of 18 months or over.		
	Massachusetts.	California.	Massachusetts.	California.	Denmark.
Loss of—					
Hand or arm	13.4	12.7	26	28	19
Foot or leg	24.8	13.4	59	42	55
Total	15.9	13.0	33	33	28

The above figures are minimums. Many of the injured men were still disabled or unemployed at the time of the investigation, and the actual disability periods, therefore, are longer than the figures indicate. The accidents investigated in California occurred later than those in Massachusetts, which accounts in part for the shorter disability periods reported.

Two important facts stand out. One is the greater severity of the foot and leg injuries over those of the hand and arm, and the other is the unexpectedly long period of disability in all cases. One-third of the workers losing a hand or foot are disabled for 18 months or over. The average length of total disability for the lesser injuries is: Loss of one eye, 4.8 months; of one thumb, 2.4 months; one finger, 2.1 months; two or more fingers, 3.8 months. The relative severity of the several types of permanent injuries is also shown by the proportion of cases of each type of injury in which disability terminates within 5 months. These proportions are: Hand or arm, 21 per cent; foot or leg, 13 per cent; eye, 67 per cent; thumb, 59 per cent; one finger, 91 per cent; and two or more fingers, 76 per cent. The percentages for the loss of limbs were based upon the combined data of Massachusetts and California; the percentages for the other injuries were based upon California data alone.

In each type of injury the seriousness of the disability increases with the age of the workman. The average total disability for those under 45 years and those 45 years or over is as follows: Loss of one limb, men under 45 years, 12.2 months; men 45 years or over, 20.3 months; loss of one eye, men under 45, 4.4 months; men 45 or over, 6.5 months; loss of one thumb, 4.1 and 4.6 months, respectively; one finger, 2 and 2.7 months; two or more fingers, 3.4 and 5.1 months. Here again the averages for the major injuries are based upon the combined Massachusetts and California data, whereas the lesser injuries are for California alone.

Change of employer and occupation.—Opportunity for reemployment by the same employer varies inversely with the severity of the injury. Of those who lose a hand or foot less than 40 per cent (Massachusetts, 39 per cent; California, 37 per cent; Wisconsin, 37 per cent) return to the same employer. For other injuries the percentages of workmen returning to the same employer are as follows: Eye, 62; thumb, 56; one finger, 58; two or more fingers, 57.

Ability to return to the same occupation also decreases with the severity of the injury. Of those who lose a hand or foot less than one-third return to the same occupation (Massachusetts, 10 per cent; California, 33 per cent; Wisconsin, 18 per cent; Denmark, 24.4 per cent). For other injuries the percentages in California are as follows: Eye, 73; thumb, 68; one finger, 69; two or more fingers, 60.

About one-third of the persons, therefore, sustaining a major injury return to the same employer, and about one-fourth reenter the same occupation, while in the case of minor injuries three-fifths return to the same employer and two-thirds follow the same occupation. Of the several types of injuries the loss of an eye has the least effect upon the change of occupation or employer.

The character of the industry determines to a considerable extent whether the injured man is reemployed in the same industry or by the same employer. Machinery manufacturing establishments show a high percentage of reemployment. This is due mainly to two reasons: First, the employees are usually highly skilled, and because of this fact are more readily reemployable; second, because of the nature of the work employment for this type of disabled man is either already available or can be more easily created. On the other hand, employers in the building construction or trucking business show a low percentage of reemployments. The character of the work and the small size of the establishment account chiefly for the nonreemployment in these industries.

The percentage of those unemployed increases with the seriousness of the injury. Of those who lost a limb about one-fourth were unemployed at the time of the investigation (Massachusetts, 23 per cent; California, 27 per cent; Wisconsin, 16 per cent; New York City, 54 per cent). Of 45 eye-injury cases in California, 13 per cent were unemployed. Among those suffering minor injuries the per cent of unemployment was small. In California, of those losing one finger, 2 per cent were unemployed; of those losing two or more fingers, 5 per cent were unemployed; and of those losing a thumb, none was unemployed.

There was practically no difference between right-hand and left-hand injuries as regards length of total disability and opportunity for reemployment. This is due to the fact, as will be explained later, that a crippled man's greatest handicap is not his inability to perform work, but his inability to get a job.

A comparison, from the standpoint of degree of skill required, of occupations held by workmen before and after injury, shows that a smaller number were engaged in skilled work after the injury than before it. In Massachusetts, of the injured workers losing a limb, 60 per cent were in skilled occupations before the injury, whereas only 31 per cent were in skilled occupations after the injury. In California the corresponding percentages were 61 before and 45 after the injury. Of those sustaining minor injuries practically the same per cent were in skilled occupations after the injury as there were before.

Inability to speak English in many cases lessens the opportunity for reemployment, although it is not possible to show this statistically, because of incomplete and indefinite data. In a number of cases reported by the industrial accident board and by insurance companies in Massachusetts this factor had a determining influence. Ability to understand and speak English may not be of vital importance to a machine tender in a cotton mill, but it is essential to

watchmen, messengers, and elevator operators, and it is occupations of this character that most of the injured employees fill after their injury.

Summarizing the above conclusions, it may be said that reemployability of crippled industrial workers varies directly with degree of occupational skill and ability to speak English, and inversely with the severity of the injury and the age of the employee.

Change in wages and earning capacity.—The effect of the injuries upon earning capacity is difficult of determination. Change in earning capacity is indicated by the difference in the wages received before and after injury, but this method of comparison is entirely misleading unless industrial conditions have remained stationary for a sufficient length of time. Another method is to compare the wages of crippled workers with those received by normal workers in the same occupation; this method is faulty, however, in that it takes no account of change in occupation necessitated by the injury. The best method of measuring reduction of earning capacity is to compare the present wages of the injured worker with the wages current in the occupation in which he was injured.

In Massachusetts 48 per cent of the injured workmen (hand and foot cases) received less at the time they returned to work than they received before the injury, 34 per cent received the same wages, and 18 per cent received a higher wage. In California the corresponding percentages were 41, 33, and 26. In case of the lesser injuries (eye, thumb, and fingers) 17 per cent received less, 33 per cent received the same, and 50 per cent received more.

Relative severity of upper and lower limb injuries.—It may be well to emphasize here that while from the medical and economic standpoint the loss of a foot or leg is more serious than the loss of a hand or arm, the compensation schedules of every State are based upon the theory that industrial workers who lose an upper limb suffer a greater economic loss than those who lose a foot or a leg. Even the committee on statistics of the International Association of Industrial Accident Boards and Commissions seems to have adopted this view in formulating its severity rating schedule. The common, and practically the only, argument in substantiation of this belief is that "it stands to reason." Yet an analysis of the following table, giving the results of four independent investigations, shows the contrary to be true.

There are two main reasons for this. In the first place the economic severity of foot and leg injuries is accentuated by the fact that a preponderant number occur in industries in which the loss of the member is a practical bar to employment. A one-legged man is effectively excluded from most of the operations in the transportation, construction, lumbering, and mining industries; it is in employ-

ment of this character that three-fourths of the foot and leg injuries occur. In California 91 per cent of the permanent foot and leg injuries occurred in nonmanufacturing industries and 60 per cent occurred in transportation and construction. An analysis of the permanent disability accidents in Massachusetts during the first four years' operation of the compensation act shows that 75 per cent of the hand and arm injuries occurred in manufacturing industries and 25 per cent in nonmanufacturing industries, while the percentages as regards foot and leg injuries were exactly reversed, being 25 in manufacturing and 75 in nonmanufacturing industries. Nearly all of the latter injuries occurred in the building trades, transportation, and construction.

Ordinarily when one thinks of the relative industrial usefulness of an upper and a lower limb one has in mind factory operations. And, of course, in operating a machine a one-legged man is less handicapped than a one-armed man; but machine operators do not lose their legs, they lose their hands and arms. In manufacturing industries in which the majority of upper-limb injuries occur, the injured workman can often go back to the same employer or the same occupation. On the other hand, the industries dangerous to lower limbs are the industries in which the use of lower limbs is practically indispensable. A larger proportion of those who sustain foot and leg injuries, therefore, must seek a new employer, and this fact affects adversely their reemployability (see table below).

In the second place, the greatest industrial handicap heretofore suffered by a crippled worker, as already noted, has not been his inability to perform work, but his inability to get a job. Potential ability to perform work is of little use to a workman who by reason of his injury is prevented from seeking employment, or is not employed even if he does find a prospective job.

The following table shows the relative severity of upper and lower limb injuries as shown by four independent investigations:

RELATIVE SEVERITY OF UPPER AND LOWER LIMB INJURIES AS SHOWN BY VARIOUS INVESTIGATIONS.

Place of investigation.	Average period of total disability in months.		Per cent of cases in which disability continued for 18 months or more.		Per cent unemployed.		Per cent reemployed by same employer or in same occupation.	
	Hand or arm.	Foot or leg.	Hand or arm.	Foot or leg.	Hand or arm.	Foot or leg.	Hand or arm.	Foot or leg.
Massachusetts	13.4	24.8	26	59	.....	.....	52	30
California	12.7	13.4	28	42	30	24	[1] 40	[1] 32
New York City	.....	.....	.....	.....	41	62	.....	.....
Denmark	.....	.....	19	55	8	17	[2] 27	[2] 16

[1] Per cent reemployed by same employer. [2] Per cent of persons reemployed in same occupations.

It will be noted that in practically every case the loss of a foot or a leg is more serious than the loss of a hand or an arm as regards length of total disability, per cent of persons reemployed by same employer or in same occupation, and per cent of persons remaining unemployed after the injury.

Comparison of statutory benefits with probable loss of earning capacity.—Adequacy of compensation benefits should be earnestly considered in conjunction with the whole rehabilitation and reemployment problem. In none of the existing State compensation laws is the scale of benefits commensurate with the economic losses sustained by reason of industrial injuries. The benefits provided under the most liberal law are not more than 50 per cent of full indemnity, and those provided under the least liberal law are not over half that of the most liberal. Some idea of this inadequacy is obtained by comparing the statutory benefits with the schedule of severity ratings of industrial injuries formulated by the committee on statistics of the International Association of Industrial Accident Boards and Commissions. The purpose of this schedule was to obtain a more accurate measure of industrial hazards and was not intended as a basis of compensation awards. Assuming, however, that the schedule is a reasonable measure of adequacy for compensation payments, how do the compensation scales in our State laws compare with this schedule? The following table shows, for the more important injuries, the severity ratings in terms of number of weeks of time lost as computed by the committee on statistics, the number of weeks of compensation benefits usually provided in State laws, and the percentage the average time allowances of all the States is of the severity schedule:

SEVERITY RATING IN TIME LOST FROM EACH SPECIFIED INJURY, AND PER CENT OF THIS LOSS COMPENSATED BY STATUTORY BENEFITS.

Injury.	Severity ratings in time lost (in weeks), computed by committee on statistics of I. A. I. A. B. C.	Number of weeks for which compensation is usually payable under State compensation laws.[1]	Per cent average time allowance of State laws is of committee's severity schedule.[2]
Death	1,000	300	.....
Permanent total disability	1,000	500	64
Loss of—			
Arm	600–750	200	29
Hand	500	150	33
Leg	500–750	175	38
Foot	400	125	35
Eye	300	100	36
Thumb	100	60	53
Index finger	50	30	66
Great toe	50	30	55

[1] The number of weeks here given are those provided in the normal or model State compensation law.
[2] These averages are computed from the arithmetical average of all the State laws having specific schedules.

As the table shows, the average statutory compensation provided for the loss of a hand, arm, foot, leg, or eye is approximately one-third of the loss of earning capacity caused by such injuries. Moreover, the adequacy of the benefits provided decreases with the severity of the injury. The above percentages refer only to time. When the statutory wage percentages are applied, the percentages of adequacy are still further reduced. Furthermore, a just and adequate compensation scale for permanent disabilities should take into account not only the workman's decreased earning capacity, but his increased living expenses as well. If the necessary expenditures of a one-legged man are greater than those of a normal man, his net income and consequently his real earning are doubly reduced.

ANALYSIS OF CAUSES.

From the foregoing facts it is quite clear that the present industrial handicap of the workman who sustains a major injury is a serious one. The period of total disability resulting from the injury is unnecessarily long. Only about one-third of the seriously crippled workers return to the same employer, and relatively few reenter the same occupation. The compensation benefits are inadequate, and practically no retraining has been done. A critical analysis of the several contributory causes shows that nearly all of these causes have their origin in, and are closely related to, the absence of a central and responsible supervising authority. The welfare of our crippled men has been nobody's business. Closely connected with this irresponsibility is the lack of opportunity. The very fact that men are crippled has closed the door of opportunity against them. They are not given a chance to show their worth or ability. Some of the more important of these contributory causes, in the order in which they would present themselves to the injured employees, are as follows:

1. The injury produces a sense of helplessness and uselessness. The injured man's self-reliance is temporarily destroyed and he feels that he is "done for" for the remainder of his life. Coupled with this is a feeling of resentment and bitterness toward society for his injury. In many cases he refuses to cooperate and adopts an antagonistic attitude toward all efforts to help him. His unfamiliarity with his legal rights prevents him from distinguishing between those who wish to help him and those who desire to exploit him. Usually the first person with whom he comes in contact following his injury is the insurance company adjuster, who often antagonizes him and arouses his suspicions. The agent's efforts to obtain the facts in the case in order to ascertain whether and to what extent the company is liable are interpreted as an attempt to take advantage of him. In many cases the agent is tactless, unsympathetic, and inclined to

take advantage of the employee. At the very time when the injured man is in most need of assistance and sympathetic advice he meets with indifference and exploitation. This initial experience colors all his subsequent acts and has an important effect upon his reaction toward medical treatment, rehabilitation, and reemployment.

2. Another contributory cause is the inadequate medical service furnished, both as to quantity and quality. From every viewpoint, and especially from that of social economy, unlimited medical and surgical treatment, without cost to the employee, should be provided. Here again the element of distrust affects adversely the speedy recovery of the injured man. In many cases the employee is suspicious of the service provided by the insurance carrier and is exploited by those in whom he has confidence and who speak his own language. There is no one to take an intelligent interest in him and to obtain his confidence. Furthermore, some races are peculiarly sensitive to pain and refuse to undergo necessary operations or other treatment recommended. Because of this lack of cooperation the injury does not heal properly and disability is unnecessarily prolonged, or made permanent.

3. A third contributory factor, correlated with the medical service, is the lack of rehabilitation hospitals for functional restoration. Practically the only attempt at rehabilitation revealed by these studies was the furnishing of artificial hands or arms, and these were supplied in only about one-half the cases. In many instances the men refused to wear these appliances, either because they did not fit or because they were unsightly and useless. No systematic instruction in the adjustment and use of them was given.

4. Not only has there been very little reeducation and retraining of industrial cripples, but a large proportion have never been educated or industrially trained at all. The task of retraining our disabled men brings into relief the great need for industrial education. However, those who are most helpless and in need of assistance are foreigners, and consequently even an adequate industrial education system would not solve the whole problem. But by no means all of the disabled would be subjects for retraining. Very little could probably be done with the old men—those who were already near the end of their industrial career at the time of the injury. But an intelligent readjustment of industry and the interested cooperation of employers would take care of most of the remainder. Thousands of positions exist which a one-armed or one-legged man could fill as successfully as a normal man. Obviously, however, it would not be desirable to place all these injured men in such positions without regard to age. For example, men under 21 or 25 years of age should not spend the rest of their lives operating elevators. Those most in

need and best adapted for reeducation are the young men. Of the disabled men studied in Massachusetts, 12 per cent were under 21 years, 28 per cent were under 24, and 43 per cent were under 30. For California the corresponding percentages are 9, 18, and 35. Most of these could probably be benefited by reeducation and retraining for suitable occupations.

5. None of the compensation States have established proper facilities for the reemployment of handicapped men. In Massachusetts insurance companies must pay compensation for total disability until the men are reemployed. Consequently, it is incumbent upon them to find employment, but they have not been very successful. Employers refuse to employ these industrial cripples unless they were injured in their own establishments. Even then, because of the character of the industry, the size of the establishment, the employee's lack of skill and ability to speak English, his possible adverse effect upon plant output and processes of production, and the risk of a second injury causing serious or total disability, many are not reemployed. Few employers will employ handicapped men injured in other establishments. They feel no moral responsibility in the matter and do not want to be bothered with cripples, especially if plenty of normal workers can be had at low wages. On the other hand, many employers do feel morally responsible for workmen injured in their own establishments, and this despite the fact that their full legal obligations have been met by the payment of compensation insurance premiums. However, moral responsibility, though important, is not necessarily the sole determining motive in reemploying even their own injured men. A study of the reemployment cases in Massachusetts discloses the fact that in many instances the men taken back are old, faithful, and usually skilled employees whose knowledge of the business is an economic asset to the employer.

One reason frequently advanced for not employing handicapped men is that such men constitute an extrahazardous risk. From the accident-compensation standpoint, injuries sustained by physically defective workmen are more serious than similar injuries sustained by normal workers and the accident or insurance cost to employers or insurance carriers would be increased. As a matter of fact, however, this fact is probably largely psychological, for the number of such accidents as compared with the total is practically negligible. No figures are available showing the actual number of second permanent injuries. However, a computation made by the Bureau of Labor Statistics from accident data furnished by the Industrial Commission of Wisconsin shows that the annual number of second major injuries would at the very most be not over four in the entire State, that is, of all the persons in the State of Wisconsin who had

lost a hand, arm, foot, leg, or eye not more than four would suffer the loss of a second major disability in any given year.

From the insurance standpoint, therefore, the employment of physically defective men would present no special problem. The increased compensation cost, which would be slight, could be taken care of by the necessary increase in insurance rates. But this does not hold true as regards self-insured employers, because in such establishments there is a greater and more direct connection between accidents and compensation costs, and because of this connection there is a decided tendency among self-insurers, through their system of physical examinations, to discriminate against handicapped men.

This factor of discrimination, therefore, whether based upon justifiable grounds or not, does actually exist and must be met. Two remedial measures suggest themselves. One is the adoption of the New York plan of compensating for second injuries. Under the compensation act of this State the liability of an employer for a second major disabling injury is limited to the liability resulting from that particular injury without reference to any prior disability. Compensation for the remaining disability is paid out of a special fund, which could be charged to the industry as a whole. Since July 1 of this year the Industrial Commission of Ohio has also put this plan into effect in that State. Thus, from the compensation viewpoint the extra hazard element inherent in a handicapped man would be eliminated and one factor of discrimination removed.

A second remedial measure would be the adoption of a plan providing that employers, before they are granted the privilege of carrying their own risk under the compensation act, must agree not to discriminate against crippled men in the matter of employment. Such an agreement by employers is required by the compensation board of Pennsylvania.

6. One of the chief obstacles in the way of a successful solution of the whole rehabilitation problem lies in the very nature of our industrial society. Reemployment is beyond the State's present power. Our industries are privately owned and consequently opportunities for industrial employment are under the exclusive control of private employers. Employers therefore can not legally be compelled to reemploy handicapped workers.

This question of compulsory employment has been considered by foreign countries in connection with the reemployment of disabled soldiers. In France employers who refuse to reemploy their proportionate share of military cripples are excluded from obtaining any concession, monopoly, or subsidy from the State. In Italy private employers employing three or more persons must take back those

employees who had been with them one year if they can do the same work. The Paris conference of May, 1917, went on record as follows:

> It belongs to the legislature of each allied country to decide whether or not employers should be placed under obligation to employ disabled soldiers. Meantime, the interallied conference holds that there is a moral obligation resting upon employers to employ disabled soldiers in a number proportional to the importance and personnel of each industrial and commercial establishment.

This principle of compulsion or constraint might conceivably be applied to the employment of industrial cripples. For example, the State compensation acts might be amended to provide that employers having a certain number of employees must pay additional compensation to injured workmen if they refuse to reemploy these men at suitable jobs and at fair wages. Such a scheme might act as an incentive for employers to make an intelligent study of their establishments, with the result that positions could be found or created which would be mutually beneficial.

7. But actual restoration to industry solves only half of the problem. It is important to know under what conditions injured workers are reemployed. What wages should they receive, both absolutely and in relation to normal workers? What effect will their reemployment have upon the displacement of normal workers and upon the integrity of the organized labor movement? Those employers who maintain sick-benefit funds, welfare plans, and the like seem more inclined to reemploy and take care of their injured workers than other employers. On the other hand, they are extremely hostile to labor organizations and would resent interference from this quarter. It is the policy of some of the labor unions to look after their own disabled men, but a large proportion of injured workers are not members of labor organizations. The difficulties involved in these fundamental problems, though great, need not be insolvable, but they require cooperation and careful study.

8. Another factor tending to prolong disability and prevent early return to industry is the operation of the lump-sum provision in many of the State compensation laws. A lump sum usually looks large and inviting to the average employee. He may want to return to his native country or to invest the proceeds in some small business enterprise, though these reasons are frequently given merely as a pretext to influence the industrial board. Often the employee is afraid that his return to work would prejudice his rights under the law. As a result the case drags on and on until for sheer relief a lump sum is finally granted.

9. For the reasons mentioned above the injured man remains disabled and unemployed much longer than the circumstances warrant. Accustomed to idleness and regular compensation payments he feels

progressively less inclined to resume work. He gets into a rut, adapts himself to a lower standard of living, and loses his ambition and initiative. His idle time is frequently spent in saloons and other lounging places, in which he finds cronies similarly situated. Here he discusses his ailments, the seriousness of which he is inclined to exaggerate, and the effect of which produces a psychosis which impairs his will power and accelerates his physical deterioration.

10. An analysis of the foregoing contributory causes shows that they are all closely related to, and the result of, the lack of an intelligent and responsible supervision. The welfare of our disabled men, whether injured in military or civil life, is a social and public function. Accident prevention, compensation, insurance, medical treatment, rehabilitation, reeducation, and reemployment are all component parts of this problem and should be under the supervision and jurisdiction of a single public body. Delegating to private agencies the performance of these social functions should no longer be tolerated. This is not intended as a criticism of these private agencies. They have developed largely because the State failed to grasp its opportunity or shirked its responsibility; but the fact remains that they have not been able to perform these social functions successfully.

REMEDIAL SUGGESTIONS.

An examination of the facts and an analysis of the contributory causes prompt the following remedial suggestions:

1. *Compensation.*—(*a*) The compensation scale of benefits should be materially increased to approximate the loss of earning capacity. (*b*) Benefits for permanent injuries causing dismemberment or mutilation should be fixed at a definite, though adequate, amount, graded according to nature of disability and age and occupation of the employee, but not dependent upon employment in individual cases. Injured employees should not be penalized for rehabilitating themselves. When the injured man knows that the amount of his compensation will not be affected by his early return to industry, disability and unemployment will be materially decreased. (*c*) In Massachusetts compensation is paid for the loss of a major member for 50 weeks, and also for total disability while disabled, and these payments run concurrently. This practice of concurrent payments should be abolished. The combined weekly amounts of such payments in most cases exceed the employee's wages. Employees are often under the impression that the amount received will continue indefinitely, and consequently have less desire to return to work. (*d*) The present system of granting lump sums should be abolished or materially restricted for reasons already explained. (*e*) Employers should be relieved of the added risk involved in the employment of disabled workers.

2. *Medical service.*—(*a*) Adequate medical and surgical treatment, including necessary appliances, should be furnished by the State. (*b*) Orthopedic and rehabilitation hospitals should be established and maintained by the State, utilizing present institutions wherever possible.

3. *Reeducation and retraining.*—There should be established vocational training schools, with both day and night courses, which should be closely correlated with the rehabilitation hospitals.

4. *Reemployment.*—A survey of the occupational opportunities in the various industries of the State should be made and the cooperation of the employers and labor organizations should be enlisted. Thousands of positions exist or could be created which crippled workers could fill as successfully as normal workmen were the problem carefully studied and an intelligent readjustment made. Particular care should be taken to eliminate the stigma of charity. The positions should be necessary and constructive in an industrial sense in order that the handicapped man may feel himself an integral and important part of the economic world and thus maintain his self-respect.

5. *Insurance.*—In the field of workmen's compensation, competitive insurance companies are wholly unsatisfactory. Either a monopolistic State insurance fund or an employers' mutual association should be substituted for the competitive casualty companies.

6. *Administration.*—The entire administrative and supervisory work should be under the jurisdiction of one central authority, preferably the industrial accident commission. This commission should, in case of necessity, have power to coerce the employee as well as the employer. Confidence, impartiality, and intelligent direction and supervision are vital factors in the whole rehabilitation problem, and these can best be obtained through public administration.

Mr. Ralph M. Little, former chairman of the United States Employees' Compensation Commission, and now director of the American Museum of Safety, called the attention of the conference to the Smith-Bankhead bills (S. 4922 and H. R. 12880) providing for Federal and State cooperation in promoting the vocational rehabilitation of persons disabled in industry or otherwise and their return to civil employment. He gave an address explaining the meaning and objects of the bills and urged that they receive the support of the association.

The following motion was passed by the convention:

Moved that this organization indorse the principle of the Smith-Bankhead bills (S. 4922 and H. R. 12880) and that the president of this organization be authorized and instructed to appoint a committee for the purpose of furthering legislation along that line.

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