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IS IT SAFE TO WORK?
A Study of Industrial Accidents

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PREFACE

WHY must thousands of persons be killed and injured annually in American industry, when reliable authorities agree that 75 per cent, or more, of all accidents could be avoided? Why should we permit our great industrial system to function so inefficiently, when a few employers in each line of production have shown that automobiles, steel, gunpowder, clothes, and all other articles can be produced profitably without the killing and maiming of workers? Why is it that we who have such a hatred for war condone a continual battle field in industry, where the casualties exceed those of war?

This book attempts to answer these questions. In doing so, it calls attention to gross injustices in our present workmen's compensation system, and shows that a scientific treatment of the injury problem has been made impossible because of the conditions surrounding the passage and administration of accident, compensation, and vocational rehabilitation legislation.

There is no one direct and simple answer. The complicated and many-sided nature of our problem makes it difficult of solution, and requires us to make frequent journeys into what at first may appear to be unrelated territory.

A superficial examination of this work may lead to the conclusion that it embodies an attempt to cover three different and unrelated subjects — industrial accidents, workmen's compensation, and vocational rehabilitation.

In part, this conclusion is justified; three different subjects are under consideration. But they are not unrelated; they are mutually dependent.

The prevention of industrial accidents has usually been associated with machine guards, warning signs, and safety engineers. Workmen's compensation insurance has been developed primarily to pay injury benefits, rather than to prevent accidents. Vocational rehabilitation has been instituted to retrain disabled persons who could not reestablish themselves financially. There has not appeared to be any relationship between such seemingly diverse things as safety guards and insurance premiums, or weekly benefits and classes in bookkeeping.

Gradually, however, the idea has gained credence that there might be an intimate relation between industrial accidents and workmen's compensation insurance. Here and there, an actuary has attempted to persuade employers that they might reduce their premium rates if they could curtail the number and seriousness of industrial accidents. Other persons, interested more in the safety of the workman than in the amount of premiums which the employer had to pay, have seen that the problem of safety is a pecuniary one, and that its solution, therefore, demands something more than the application of safety engineering knowledge to the technique of production.

When the State Boards for directing the work of vocational rehabilitation were established, it became a rather general custom to place on the Board one or more persons interested in workmen's compensation. In some States the retraining of disabled persons was administratively

linked with workmen's compensation. In a few jurisdictions the authorities have gone so far as to allow additional benefits when the injured person has consented to be rehabilitated. Occasionally, also, money has been provided for the purchase of artificial limbs.

With the exception of these rather significant gestures (and they amount to but little more), the potential relationships existing between accident prevention, workmen's compensation, and rehabilitation still remain for the most part unappreciated. As long as this situation continues, the progress of accident prevention will be retarded, crippled persons will not receive compensation benefits commensurate with their sacrifices, and the work of retraining the disabled will fall short of its possible effectiveness.

In this book accident prevention, workmen's compensation, and vocational rehabilitation are treated as integral parts of an attempt to have goods and services produced with a minimum of sacrifice on the part of workers. Accident prevention is made the desired goal; workmen's compensation is regarded as the best tool to promote safety; vocational rehabilitation is conceived as the remedy to be used only when safety is not realized. In this capacity it is justified, because it conserves for society at least a part of the productive power of the disabled worker, while it enables him to become partially or wholly self-supporting.

The position is here taken that safety measures will be put forth to the extent that industrial accidents are made important items in production costs. The establishments with a low accident rate must be rewarded by

being permitted to pay smaller compensation insurance premiums than does the concern with a high accident rate. Not only must these accident costs vary with the degree of safety achieved by the different employers, but the margin between them must be sufficiently great to make injuries expensive — so expensive that the company with the poor record will realize that a failure to make its plant safe will place it at a competitive disadvantage.

Higher compensation premiums will also make possible more liberal disability and death benefits. Larger benefits are desirable, because at the present time the benefits paid fall far short of compensating for wage losses caused by injuries. These wage losses, if not properly compensated by workmen's compensation benefits, lower the standard of living of the persons involved, and work a hardship upon the whole community.

There is the possibility, however, that benefits may be made so liberal that some injured workers will be unwilling to attempt to retrain themselves for useful tasks. Rehabilitation under such circumstances may result in complete failure; the injured worker may be idle when he could be productive. In other words, while compensation based upon loss of earning power is advocated as the basis of paying disability benefits, the actual loss compensated for must be the difference between the original earning power of the injured worker and that which he is able to earn after rehabilitation.

The problem under discussion raises many difficulties because it is in the nature of a dilemma. The dilemma is this: Unless benefits are made high enough to necessitate

larger compensation insurance premiums, the number of accidents will not be reduced; but if the benefits are made too liberal, attempts at rehabilitation may be defeated.

The basic problem under consideration, then, seems to be to find ways and means of making industrial accidents more costly to employers than heretofore, and at the same time of retaining the proper incentive for disabled persons to accept retraining. To differentiate between the careless and the careful employer, to conserve earning capacity whenever possible, and then to compensate for whatever deficiency remains, constitute the program. Such a program is possible only when, prevention, compensation, and retraining are viewed as related parts of one comprehensive whole.

The author has received valuable suggestions and other assistance from many persons, for which he wishes to make acknowledgment and to express appreciation.

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March, 1930

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CHAPTER I

INDUSTRIAL INJURIES

NOTHING may be more meaningless than numbers. To most persons a million of anything, or even a thousand, is difficult to visualize. To say that so many thousand persons are killed and injured annually, or that the pecuniary loss resulting from such injuries amounts to so many millions or billions of dollars, is only putting injuries in the category of big things, without giving any notion of their importance. Most people readily accept the statement that a great many persons are killed. But just how the injury problem compares in importance with other problems which society constantly faces, the ordinary man is in no position to gauge.

Industrial Injuries Outnumber War Casualties

Over a long period of years, war has come to be regarded as the most destructive of all agencies, the acme of things horrible. Yet the workshop is more dangerous than the battle field. Since our country has become an independent nation, fifteen times as many persons have been killed or injured in industry alone as have been lost in the Nation's battles. The losses of war loom large for a time only, but the losses of accidents accumulate with:

monotonous regularity. A mine explosion yesterday, a broken scaffold to-day, a train wreck to-morrow — each makes its contribution every year to the appalling number of those injured. The direct financial loss has been estimated as billions of dollars annually, while the indirect loss is beyond all calculation. In addition to all such losses are the human suffering and misery, the extent of which cannot be conceived, but which, taken as a whole, exert a tremendous effect upon the welfare of our country. For reasons which will be developed in subsequent chapters, the problem of accidents is especially serious in the United States. There are killed in this country, per million of population, almost twice as many persons as in France or Japan, more than twice as many as in Great Britain, and four times as many as in Denmark. It behooves us to give deep consideration to this question. Are we buying our industrial ascendancy at the price of our workers' lives and limbs?

Complete Data are not Available

Statisticians of the National Safety Council estimate that more than 96,000 men, women, and children were killed in accidents of all kinds in the United States in 1928. Just what fraction of this number are industrial injuries, nobody knows. There are no statistics of work accidents covering all the States. Four States have no compensation laws and no records of accidents. Not all the remaining States publish the number and type of injuries compensated in their respective jurisdictions. The reports that are available are not entirely comparable, since they do not cover identical time periods.² Some in-

clude and others exclude occupational diseases; some list all injuries, while others report only those of a week's or two weeks' duration. Classifications have different meanings in different States. Out of this heterogeneous mass of data, it is impossible to glean anything like exact figures. At best, any calculation in its final form involves estimating. Fortunately, some estimates have been made.

In 1913, Dr. Frederick L. Hoffman, statistician of the Prudential Life Insurance Company, estimated the annual number of fatal industrial accidents to be 25,000.² Six years later Mr. F. S. Crum, of the same company, placed the annual number of fatal industrial accidents at 23,000; and the number of injuries causing at least one day's disability, at 3,000,000. This estimate was accepted by the Federated American Engineering Societies in their study on elimination of waste in industry.³ Dr. E. H. Downey believed the annual number of fatal injuries to be about 25,000; the number of serious permanent disabilities, 25,000; and the number of temporary disabilities about 2,000,000.⁴ Michelbacher and Nial maintain that previous estimates have been excessive, and that the annual number of industrial fatalities is not more than 15,000.⁵

Our estimate, like all others, will necessarily be of a general nature, because it, in turn, is based in part upon other estimates. For 1926, a total of 11,924 fatal and 1,863,402 non-fatal injuries were reported by 42 States.⁶ These States comprised about 89 per cent of the total population of the country. If we assumed an injury rate in the remaining 6 States comparable to that of the country

as a whole, there would be some 13,285 fatal and 2,093,710 non-fatal injuries in the 48 States.⁷

Not all persons are covered by workmen's compensation laws. A large number of persons engaged in agriculture, in domestic service, and in very small establishments are excluded. This fact raises the question as to the percentage of workers actually covered by compensation acts. Injuries to those not covered are, of course, not recorded. In 1919 Dr. Carl Hookstadt, of the United States Bureau of Labor Statistics, estimated that the average number of persons subject to State compensation laws was about 70 per cent of the total number employed.⁸ Since 1919, the situation has changed somewhat. More persons have been included in the scope of the acts, and a larger proportion of injuries are being reported.⁹ The average number of persons subject to State compensation laws in 1927 was probably about 80 per cent of the total number employed.¹⁰ If we assume that those persons not covered by compensation acts are exposed to an injury hazard comparable to that being faced by insured workers,¹¹ the total annual number of fatal injuries must be raised to 16,606 and the number of non-fatal injuries to 2,604,637. These figures are more in the nature of minimums than maximums.¹² The annual number of fatalities may be as great as 20,000.

Injuries are Very Costly

The average fatality cuts off twenty years of productive labor. This means that the country as a whole, on the basis of 20,000 fatalities per year, is deprived of 380,000 man-years of labor because of each year's fatal accidents.

The serious permanent disabilities result, on the average, in a reduction in earning capacity of nearly 50 per cent. This is equivalent to the loss of some 350,000 man-years²³ of labor. The less serious injuries account for probably 3,000,000 weeks of lost labor annually. All types of injuries taken together cause an annual loss of time of more than 280,000,000 working days.

The annual wage loss attributable to industrial injuries amounts to more than a billion dollars; the annual total loss, to probably four billion. In this are included the cost of medical and surgical attention, and the overhead cost in connection with the payment of claims, as well as a heavy indirect cost. The indirect loss of production is very significant. Whole processes may have to wait because of a single accident. The injurious effect of accidents on the morale of the workers is almost impossible to estimate, but that it is considerable is evident to any one who has seen a serious accident where large numbers of persons are employed.

There are Many Causes for Injuries

The customary way of placing fault for injuries is to say that a certain part of the blame is due to the negligence of the employee; another part is due to the failure of the employer to provide proper working conditions, tools and equipment, and so forth; and all injuries not thereby accounted for are thought of as being nobody's fault. Some accidents appear to be due to carelessness, foolishness, or seemingly inexcusable ignorance of employees. The following cases may be cited in point:

1. A helper on a shears in a rolled steel mill was in the habit of asking the shearman on the opposite side of the shears for tobacco. Becoming tired of getting up and walking around the shears, this man put his hand under the shears just in time to have the big blade sever his right hand at the wrist.
2. An employee for a gasoline distributing company, although he had been cautioned many times, lighted a match and tried to place it inside an automobile gasoline tank to determine if the tank would hold more gasoline. In the explosion that followed, the employee lost the use of an arm and the sight of an eye, and had in addition a badly burned body.

It must not be assumed that the above examples are typical accidents, but undoubtedly the records of every State reveal many such unfortunate experiences. How may these accidents be explained? They may be due to fatigue, lack of sleep, or inability to comprehend and interpret orders. They may be due to mental causes. Mr. Boyd Fisher believes that mental causes are primary in explaining accidents. In his book, *Mental Causes of Accidents*,¹⁴ he divides these causes into five heads: ignorance, predisposition, inattention, preoccupation, and depression.

A study of 75,000 industrial accidents by the Travelers' Insurance Company revealed the fact that only about 10 per cent of accidents are due to physical and mechanical causes, whereas nearly 90 per cent are attributable to the human factor — faulty instructions, poor discipline, unsafe practice, and so forth.

Just as some accidents may be definitely traced to the negligence of the employee, so may others be attributed to the employer. Here are two examples:

1. A planing mill had in operation a large circular saw with no guards around it. An employee had his thumb taken off. Another employee was put in his place. Within a few days this man had his wrist so badly cut that an amputation was necessary. Meanwhile, State officials insisted that the saw be guarded. The guard was not immediately supplied, the blame for the delay being placed upon the foreman in charge. A short while later this same foreman, having some work to do, and nobody available to do it, began operating the unguarded saw. He was fatally wounded after a few minutes of work. Then, and then only, did the company, under the compulsion of the State, guard the machine.
2. A steel company, specializing in the production of iron bars, made a practice of using hand trucks in moving steel about the plant. These trucks, when loaded, weighed as much as 15 tons, and ran from the stock room to the loading car by gravity. Many times one truck would run into another truck with tremendous force. Occasionally, an employee would have a finger smashed or a glove caught between the protruding bars. Requests were repeatedly made that brakes be put on the trucks, but the company did nothing. One night the foreman of the shipping department did not move quite quickly enough, was caught between two trucks, and pierced as if by a hundred spears.

Conditions such as these testify to poor shop management, or insufficient State inspection, or both. Some employers will not make their plants safe because they fear that the expense involved will reduce profits. Further, many a factory manager lives under the delusion that in his plant a serious accident will never occur.

That State inspection is sorely deficient is apparent to all who are familiar with the situation. It is not uncommon for one inspector to have under his jurisdiction all the factories in several large industrial cities. In a territory so large, it is impossible to give adequate attention to each plant. Often the result is a superficial inspection and a duplicate of the previous inspection report with the date changed. An example of the inadequacy of State inspection is found in this extract from the annual report of the Louisiana Commission of Labor:²⁵ 'In the discharge of routine duties, practically every industry in the State has been visited and inspected by some attaché of this department during the last year, and in many industrial centers, even more inspections have been made.'

Aside from those accidents which are caused directly by somebody's negligence, there are many others in which it is difficult to determine fault. The general explanation of the causes of these accidents is to be found in the inherent hazards of industry as it has been conducted since the coming of the machine process, and as it is likely to be conducted in the future, with the ever-increasing intensity of the newer and more powerful machinery. The very nature of modern production seems to demand the hands and legs and arms and eyes and even the lives of men and women. There are punch presses which smash fingers; metal shears which cut off hands; calendaring machines which tear off arms; giant rolls which smash bodies; falls which break legs; cave-ins which wrench backs; flying dust which blinds eyes. These are the concomitants of machine production.

Throughout modern industry, the human organism is expected to adapt itself to an ever-changing mechanical environment. Machine production is increasing in its complexity; speed has become synonymous with efficiency; unskilled and less responsible workmen have replaced old-line mechanics. It is a constant race between man's powers of adaptability and industry's changes in its methods of production. There is good reason to believe that workers unaided would be the losers in the race, and that the only thing that prevents them from losing entirely is the constant assistance given them through safety devices of all kinds.

There are other factors which help increase the injury rate. One of these is temperature. If a plant is too warm or too cold, there are likely to be accidents. In the world's deepest gold mine, the Morro Velho, in Brazil, it was found that with a temperature of 89 degrees there were 20 fatal injuries in 16 months. A cooling plant was erected. In the 16 months following, with a temperature of 80 degrees, there occurred only 6 fatal injuries. As this change in temperature was the only alteration, the presumption is that it was responsible for the reduction in the accident rate.²⁶ During cold days, if plants are not heated properly, and if the work is not strenuous enough to keep the body warm, the hands become numb and lack the power of 'feeling' danger, with the result that more accidents occur than at other times. This was apparent in a cold drawn steel mill where, with virtually the same number of employees doing the same type of work, the number of injuries in January and February was nearly twice as large as in April and May. It seems reasonable

to assume that at least part of this difference should be attributed to temperature.

Lighting also influences the injury rate. A majority of the accidents occurring in halls and passage ways may be attributed to defective lighting. Either there are not enough lights or they are so arranged as to cause obscuring shadows. Artificial lighting, in the main, is inferior to natural light, although the results obtained with modern illuminating devices are in some instances very remarkable. Nevertheless, Collis and Greenwood have found that injuries are 25 per cent more numerous during the hours of artificial lighting, and also that there are 75 per cent more falls.¹⁷ In some kinds of work, such as ship-building and dock work, there are about twice as many injuries during the period of artificial lighting.

The Injury Problem is Still Unsolved

Perhaps the most significant thing about the problem of injuries is that, taking the country as a whole, the injury rate since the War seems to be upward. At this point, a word of caution is necessary. What is meant by an increasing or a decreasing injury rate? When the actual numbers of injuries are compared for different years, usually no account is taken of the size of the respective populations or of the number of persons employed in each period. Frequently, a more nearly complete system of injury reporting is in force during one period than in the other, or the number of injuries reported may be greater at one time than at another.

The proper basis for computing the fatal injury rate is the number of man-hours' exposure. This takes into ac-

count, not only the number of persons employed, but also the length of the working day. The basis for the non-fatal injury rate should be the number of lost-time injuries in so many hours worked (frequency rate) and the number of days lost per so many hours worked (severity rate). For the purpose of premium rate determination, insurance companies desire to know the number of accidents in relation to the volume of payroll. Production experts and cost accountants base the accident rate upon the volume of production, to determine what part of the cost of producing each article is due to workmen's compensation. An accident rate based upon either the amount of payroll or the volume of production has its value and uses, but it is of no aid to the student of accident prevention. Unfortunately, injury statistics, for the most part, are not given in terms of man-hours' exposure.

The following figures, taken from the 1928 report of the Bureau of Workmen's Compensation of Pennsylvania, are in absolute numbers, with no account taken of the size of the population, the number of persons employed, or the type of cases to be reported. The depression of 1921 and 1922 brought with it a decrease in the accident rate, but the return of industrial activity was accompanied by a substantial increase.

Pennsylvania is surpassed by few, if any, States in the quality of its safety work. Were this not true, many more accidents would occur in the hazardous mills and mines of the Keystone State. Nevertheless, the figures in Table 1 are anything but reassuring. The fact that over two thousand persons are sacrificed year after year in the indus-

tries of a single State indicates that there is still work to be done.

TABLE I. ANNUAL NUMBER OF FATAL AND NON-FATAL INJURIES IN PENNSYLVANIA, 1920-28

YEAR	TOTAL	FATAL	NON-FATAL
1920.....	174,979	2,528	172,451
1921.....	140,197	1,924	138,273
1922.....	146,255	1,890	144,365
1923.....	200,435	2,412	198,023
1924.....	177,539	2,209	175,330
1925.....	176,392	2,022	174,370
1926.....	180,420	2,136	178,284
1927.....	160,743	2,053	158,690
1928.....	152,513	2,080	150,433

In New York State, the number of fatal injury cases (closed) increased from 1109 in 1924 to 1217 in 1929. During the same period, the number of construction accidents increased from 13,361 to 23,701. In attempting to explain this increase, the New York officials make this significant statement: 'The increase may be due in part to the greater speeding-up, with its effects on the hazards of the industry.'

'The peace-time casualty list in the industries of Ohio is simply staggering.'²⁸ This is the statement of no less an authority than the Ohio Superintendent of Safety. The annual number of fatal industrial injuries increased from 898 in 1924 to 1108 in 1928. Non-fatal injuries increased from 174,276 to 228,125. There were 123 more fatal and 9093 more non-fatal injuries in Ohio in 1928 than in 1927.

The reports of the Illinois Department of Labor are equally pessimistic. Here is a sample: 'The report with respect to fatal industrial accidents was decidedly worse

than that for the previous year. There was a material decrease in the number of employees exposed to the hazard of death, because fewer of them had jobs. But in spite of this, practically the same number were killed as during the previous year.'¹⁹

'Wisconsin has for ten years stood at the forefront of the safety movement, yet the accident rate per thousand employees was higher in 1920 than in 1915.'²⁰ In 1923 and 1924, Wisconsin rallied to the situation, and the accident problem seemed for a time to be under control. The year 1928, however, brought a fresh record of industrial slaughter.

What is true of the States is true of industries. In coal mining, the fatality rate per 1,000,000 hours of exposure increased from 1.31 in 1913 to 1.40 in 1921, and thence jumped to 1.59 in 1924. In quarrying, the frequency rate for all types of accidents rose from 38.31 in 1914 to 58.34 in 1924.

In commenting upon the industrial accident experience of 1928, the United States Department of Labor recently concluded that:²¹ 'While there were in 1928 as compared with 1927 material reductions in accidents as measured by frequency rates, in a number of industry groups there were altogether too many industries in which the number of accidents per million man-hours increased. The severity rate, which is based on time loss, tells the same story — a general increase in 1928 over 1927.'

The data just submitted are not intended to convey the idea that all business firms have failed to meet satisfactorily the injury problem. In Chapter XII, evidence will be submitted to show that some organizations have done

remarkably well in eliminating the injury hazards in their plants. Rather, the injury statistics are cited for the purpose of showing that industrial cripples are still being made; that a serious injury problem exists; and that, from the standpoint of national welfare, it is more in need of careful study and attention than it ever was before.

A newspaper editor recently commented enthusiastically upon the fact that there had been 20 fewer deaths in his State during the month just closing than there had been in the preceding month. In one sense this reduction was commendable, but the editor forgot to mention that the 'record' he was lauding represented a fatality rate higher than any during the previous 18 months, with the exception of the month with which the comparison was made. The original bench mark had been forgotten. In fact, in most jurisdictions there is no measuring stick for determining the progress of safety. Injuries occur; the facts are duly recorded. If the number is larger than usual, the fact is temporarily lamented; if it is smaller, the fact is made known and favorable comment follows.

On another occasion a writer, in attempting to extol the compensation system of his State, made the point that about \$1,500,000 more had been paid to injured workmen during the fiscal year then closing than in the previous year. This writer neglected to explain that, while about one third of this increase was due to the inclusion of more persons under the scope of the compensation law, about two thirds was attributable to an increase in the number of injuries. While it was very fortunate that the funds were available for compensating the victims, the increase in benefit expenditures was an indica-

tion of a poor injury prevention record, rather than of the liberality of the workmen's compensation law.

Conclusion

Preventing injuries is the first step in the program of getting goods and services produced with the least cost to society. To the extent that accidents are eliminated, compensation for injuries is unnecessary; the retraining of crippled industrial workers is not required. Compensation and retraining merely assist in the curing and placement of the worker who already has met with a misfortune, but preventing accidents strikes at the cause of the misfortune. Some persons, and among them not a few safety engineers and Government officials, feel that the limit has been reached in accident elimination; that information about injuries, both fatal and non-fatal, from now on, must be received as a matter of course. There may be some truth in this belief if one holds that the methods now being employed for insuring safety are beyond improvement. But such an assumption seems to be unwarranted. The systems of prevention now in use are not unalterable. Logic unites with experience to indicate that a measure of safety far in excess of that which industry as a whole now enjoys, is possible if society is willing to pay the price. Not the smallest part of this price will be the willingness to alter, and in some cases to abandon, established ideas and obsolete practices. In speaking of the tendency in this direction, Michelbacher and Nial say: "Although the records of individual employers show decided improvement, all the efforts so far devoted to the problem have failed to accomplish any radi-

cal improvement in the aggregate experience of the country. This would indicate that the original methods of approach are in need of revision, or that they must be supplemented by others, and it is apparent that an appreciation of this fact is urging students of the problem to discover more effective means of attack.'

In a later chapter, an attempt will be made to explain some methods of accident prevention which may possibly be more effective in curbing the number of injuries than some of those now in use. But such a discussion must wait for an analysis of the workmen's compensation system of the United States.

CHAPTER II

WORKMEN'S COMPENSATION SYSTEM OF THE UNITED STATES

THE term 'workmen's compensation' is a misnomer as it is now applied to schemes for paying industrial injury benefits. An injured workman assumes from three fourths to four fifths of the financial loss attending his incapacity, in addition to whatever pain and trouble the injury may have caused him. The various State compensation laws in this country — or in any other country, for that matter — are in reality limited insurance acts, limited in every sense of the word; limited as to the amount and duration of benefits, as to the number of persons covered, and in many other ways.

American States Tardily Followed European Example

The group of State laws taken together is sometimes referred to as the Workmen's Compensation System of the United States. The term 'system' seems to be inappropriate, unless it be interpreted to mean that all the laws have about the same defects. Having stood by for years, while all of the other great industrial countries were gradually developing their plans of caring for the victims of industrial accidents, the American States, in the second decade of the twentieth century, apparently at last convinced of the practicability of foreign experiments, tried to see which could be the first to write upon its statute books a law which had for its purpose the compensating

of industrial cripples. In no single decade, in any part of the world, had there been such a complete turn to a new form of social legislation as was experienced during the period from 1910 to 1920, when State after State substituted for its employers' liability system a type of legislation in which the first word in the title was 'workmen's,' while the second word suggested a payment, rather than a quibbling over the question of liability.

Workmen's Compensation Replaced Employers' Liability

Prior to the enactment of workmen's compensation legislation, employers' liability laws governed the liability of employers for accidents. The liability laws could be applied only through a court trial. The problem of the courts was to decide who was at fault, to center responsibility, and to make the guilty party assume the burden. The courts, in interpreting the liability laws, held that the employer was to provide a safe place of employment, safe tools and equipment, competent fellow workers, and adequate supervision. If he took these precautions, he was freed from the responsibility of accidents arising from the workers' own carelessness, the negligence of fellow workers, the ordinary risks of occupation, and the extraordinary dangers of employment.

If the employer, or rather the insurance company with which the employer had insured, could prove in court any one of the last mentioned points, the injured worker or his dependents had little chance of receiving compensation, however meritorious their claim might be. Investigations in the Pittsburgh coal and steel district during the operation of employers' liability laws in Pennsylvania *

disclosed the fact that, in death claims, more than 50 per cent of the families received not more than \$100 compensation each, and that, in such serious injuries as the loss of an arm or a leg, either awards were not made, or the amount was generally limited to a few hundred dollars. To-day, under workmen's compensation laws, a death award of \$6500 is not uncommon, while awards for serious non-fatal injuries range from \$1000 to over \$4000.

Germany was the first country to abandon the employers' liability system. In 1885 she enacted a Compulsory Compensation Insurance Act. Austria-Hungary followed in 1897, France and Italy in 1898, Russia in 1903, and Great Britain in 1906. The United States Government enacted a compensation law in 1908 for certain Federal employees.* A New York State law of 1910 was declared unconstitutional.

Workmen's compensation actually began in the United States in 1911. In that year, laws were passed by California, Illinois, Kansas, Massachusetts, Nevada, New Hampshire, New Jersey, Ohio, Washington, and Wisconsin. Only Arkansas, Florida, Mississippi, and South Carolina are without definite provision for compensating injured workmen.

Workmen's Compensation Coverage is Being Extended

Year by year, various groups of workmen are brought under the coverage of workmen's compensation laws. In March, 1927, a group of over 300,000 wage-earners exposed to risks greater than most factory employees are permitted to assume, were given protection through the passage by Congress of the Longshoremen's Compensa-

tion Act. Although the act applies primarily to long-shoremen engaged in loading and unloading vessels, it also provides compensation coverage for a number of trades and crafts, such as painters, carpenters, plumbers, and so on. This Federal enactment marks the first invasion, as far as private employees are concerned, of the workmen's compensation principle into South Carolina, Arkansas, Mississippi, and Florida.

Another noteworthy extension of workmen's compensation took place in 1928, when Congress passed a bill which gave protection to some 60,000 workers in private employments in the District of Columbia.

Some Workers are Still Without Protection

It must not be inferred, however, that all workers, even in States that have workmen's compensation laws, are covered by compensation insurance.³ In most States, agricultural laborers, domestic employees, casual workers, and in a few States, public employees, are excepted from the provisions of the law. In some States are to be found some unusual provisions. To give only a few examples, Maine excludes logging operations from the scope of the law, Texas excludes cotton ginning, and Kentucky omits distilling. Still other exceptions are to be found. In twenty-four States, employers of less than a stipulated number of employees are exempt from the operation of the laws. In Ohio, the number is three; in New York, four; in Alabama, sixteen.

Perhaps the greatest single omission at present is that of more than 1,500,000 transportation workers who are without the protection of a compensation law because

they are in interstate commerce, rather than intra-state commerce. Before 1906 these workers, if injured, could sue their employer under common law or State liability statute. In that year Congress passed a special liability law for interstate workers. It soon was declared unconstitutional, and in 1908 the present employers' liability law was passed. That bettered conditions somewhat, although the act in question was based on the old idea of fault of master or servant.

Whereas the harbor workers made every effort to assist in the obtaining of a Federal compensation law for harbor workers, the railway brotherhoods — at least, some of them — have not taken aggressive steps in that direction. Generally speaking, their attitude has been apathetic. They do not favor a workmen's compensation law as an exclusive remedy. Rather, they would retain the option of securing redress under a compensation law or a liability statute. This position is made clear by a declaration passed by the Order of Railway Conductors at its 34th Grand Division:

'Be It Resolved, That the Order of Railway Conductors does not favor a workmen's compensation law as an exclusive remedy for damages sustained through injury or death of employees of railroads, but it believes that inasmuch as compensation and liability laws are for the benefit of the employee it will lend its support to any bill that will strengthen the present liability laws, Federal and State, and to any compensation bill satisfactory to those who favor the principles of workmen's compensation.

'Provided, however, that said compensation bill shall

give the employee his option and election to either claim indemnity under the compensation law or maintain an action under the liability laws, such option and election to be exercised by the employee after his injury, or in case of death by his dependents after death; and that we will oppose any effort to repeal, suspend, or amend the present liability laws, Federal and State, unfavorable to the employees.'

It is probably true that a relatively small number of high court awards, such as the following,⁴ have reacted, thus far, against the passage of a compensation act:

- (a) A verdict against a railroad for \$35,000 for the death of a switchman, salary \$200 per month.
- (b) A verdict for \$27,500 to the widow of a brakeman.
- (c) A court award of \$32,900 to the dependent family of a locomotive engineer.

However, there are but few prizes. Some of the injured workers receive little or nothing, and the small amounts obtained are still further reduced by attorney's fees. The Secretary of the American Association for Labor Legislation sums up the situation by saying: 'One out of five of these men, when seriously injured, has a limited opportunity through a damage suit to secure a clumsy justice. But even then, less than half of the money awarded gets to the pocket of the injured workman.'

Not until there is a Federal compensation act to cover interstate employees, will this large and important group of workers be adequately protected. As things now stand, the States are powerless to remedy the situation.

We have examined the scope of workmen's compensation laws with respect to the number of workmen in-

cluded in their coverage. We shall next note some of the limitations placed upon the amount of compensation received by those who are injured.

Disability Benefits are Limited

All but two of the States require a minimum duration of disability as a prerequisite to the payment of compensation benefits. This 'waiting period' varies from one day to two weeks, over one half of the laws specifying one week. Some of the States later compensate for this waiting period if the disability is found to be of sufficient duration.

There is no agreement as to what per cent of the average weekly wage shall constitute the weekly award. The amount varies from 40 per cent to $66\frac{2}{3}$ per cent, depending upon the particular State in which the accident happens to occur. In Connecticut, it is 50 per cent; in Indiana, 55; in Iowa, 60; in Michigan, $66\frac{2}{3}$. Some States have different percentages for different degrees of disability and for different types of injuries; and, finally, the percentage is sometimes found to vary with conjugal condition and the number of children.

The benefit schedules are further complicated by the fact that all but about a half dozen of the States provide weekly maximum and minimum payments. The minimum payments may be dismissed without discussion. They are usually so low as to be ineffectual. But the maximum limitations are especially significant, in view of the fact that they nullify the actual percentage of wages awarded. This is shown in the results obtained in a study of 500 permanent partial disability cases⁶ in a State

where the weekly maximum (\$18.75) is well above the average,' and where the percentage of wages specified in the law is $66\frac{2}{3}$. In 386 of the 500 cases, the 'two thirds of wages' provision is meaningless, the average percentage of wages actually received being only 41.5.

Finally, the amount of injury benefits is further limited by two other factors. These are, first, the total sum of money which may be paid to an injured person or his dependents, and second, the number of weeks during which compensation shall be paid. The maximum total award for partial disability is in Colorado \$3640; in Massachusetts, \$4500; in Utah, \$5000. Although Utah has a total maximum of \$5000 as against \$4500 for Massachusetts, the weekly maximum of the former is only \$16, as compared with the weekly maximum of \$18 of the latter.

The maximum period during which benefits may be paid for partial disability is in Connecticut, 520 weeks; in West Virginia, 340 weeks; in Idaho, 150 weeks. But Connecticut's comparatively long time award is partly nullified by the further provision that benefits are limited to 50 per cent of average weekly wages at the time of injury. Conversely, West Virginia's short time award is counterbalanced by the greater per cent ($66\frac{2}{3}$) of weekly wages allowed. Idaho's short time award of 150 weeks is still further reduced by the provision allowing only 55 per cent of weekly wages to be paid as a weekly benefit, and is not helped much by the size of its weekly maximum, which is only \$16.

In some of the States the award for permanent partial disability begins immediately after the waiting period,

and is limited to a certain number of weeks. If the injury has been slow in healing, the disabled person finds his award discontinued before he is able to return to work. It is difficult to comprehend the reasoning of a State legislature which will draft a compensation law so as to have compensation payments stop before the injured person has become able to resume employment.

Perhaps the most unscientific phase of the plans for compensating permanent partial disabilities is the flat-rate schedule, which specifies how much the award shall be for each particular type of injury listed in the schedule. The number of weeks' award paid for the loss of a hand, for example, runs from 104 in Colorado to 329 in Oregon. There seems to have been no attempt to base the award upon the seriousness of the injury as measured by the loss of earning power, the desirability of which will be made clear in the following chapter.

Not all partial disabilities take the form of dismemberments. An arm, for example, may be injured so that it is partially useless. Many of the States attempt to determine just how much loss of earning capacity is caused by such injuries, and pay awards on the basis of the estimated impairment, subject to limitations of various kinds. There is a tendency to discontinue the compensation payments for these impairments before the expiration of the maximum period allowed. Thus, in a study of 278 cases, it was found that compensation continued for only about one fifth of the maximum period allowed by law, although the impairment sometimes lasted much longer.

Twenty-four States have not yet amended their laws

so as to provide compensation for life in case of total disability. The limitations on the total time for which compensation shall continue vary in these States from 300 weeks in New Hampshire to 1000 weeks in Wisconsin. But in some of the States where the laws specify that compensation for total disability shall be upon a life basis, there is the contrary provision that the total amount paid shall not exceed a certain figure, thus nullifying the life payment provision of the act. The law of Maryland, for example, specifies life payment for total disability, and then proceeds to place a limitation of \$5000 on the total amount of the award. South Dakota, although purporting to pay a life pension, shows an even greater inconsistency by limiting the maximum payments to a total of only \$3000. In still other States the amount of the pension paid for total disability is reduced, after several years, to as low as \$5 per week.

Death Awards are also Limited

In all but seven States, the amount going to the family of a man killed in industry is definitely limited.⁸ This limitation is either on the basis of the total amount of the award, the number of weeks during which it shall run, or both. Thus, in Indiana, the death award shall not exceed \$5000; in Wyoming, \$3600; in Ohio, \$6500. The maximum number of weeks during which the award shall continue is in Connecticut, 312; in Delaware, 285; in Vermont, 260. A few States pay awards to children of the victims of fatal injuries if such children have not reached a self-supporting age. But these allowances to children are in most instances less than the awards to an

able-bodied widow. Oklahoma does not pay even death benefits.

Medical Service is Inadequate

Many of the State laws fail to provide proper medical service. All the States, except Arizona, provide some medical benefits, but some of the provisions are very limited. The limitations take one of two forms: either the amount of money for medical service is limited, or the number of weeks during which medical attention is provided is limited. Seventeen States place no limitations upon the amount of money which may be spent for medical services, although seven of these States nullify what would otherwise be a most commendable provision, by limiting the maximum time during which medical attention shall be given to two weeks, sixty days, ninety days, and so forth. Conversely, some States provide an unlimited time for medical attention and then specify that the maximum amount so spent shall not exceed \$150 or \$200. There are many injured men and women who have suffered greatly because of this limitation. Poor amputations, lack of attention to broken bones, uncorrected internal injuries are some of the results of insufficient funds, which have made adequate expert attention impossible. In some instances, artificial appliances should be provided. True, the injured person may be able to purchase these from his compensation receipts, but if he happens to be caught with his injury unhealed, his award exhausted, and no job in sight, the purchase may be impossible.

Despite the limitations placed upon the amount of

medical aid, the total amount spent annually for this type of service is comparatively large. The National Council on Compensation Insurance found that, for the policy years 1918, 1919, and 1920, medical expenditures in thirty States comprised 20.7 per cent of the compensation payments, or \$48,133,542 out of a total of \$232,374,728.⁹

Workmen's Compensation and Rehabilitation should be Coördinated

Another weakness of our compensation laws is their failure to coördinate properly with a new activity designed to guide the interests of an injured man after a compensation commission or board is through with him — that of the reëducation, or, as it is usually called, the rehabilitation of the injured person. This work is still new, and it is too much to expect that all of the compensation laws should yet have been adjusted to the rehabilitation movement. But there is no reason why the present laws should not be amended so that all efforts to assist the injured workman may be unified. In a later chapter, an attempt will be made to show, first, what has been accomplished in the retraining of industrial cripples, and second, what may be done to coördinate compensation and rehabilitation activities.

Administration has Serious Defects

Not only do many of our compensation laws fail to make adequate provision for injured workers, but the inadequate laws are often inefficiently administered. Because the laws are constructed as they are, and because

administrative boards are everywhere under-manned, the injured person must often, first, know his rights, and second, be willing to take the proper steps to secure them. But, unfortunately, the average injured employee does not know his rights under the compensation law. He does not know even the general outlines of the law of his own State. Nor can his associates assist him. Their half-knowledge may even be detrimental to his interests if they happen to tell him something which is not true. But the main trouble lies in administration. Let us grant that the average employer is honest, that he wants to see his men properly taken care of, and that he is willing to carry out those provisions which the law requires of him. A man in his plant is injured. An office employee, charged with many duties, fills out the report. The report is mailed, let us say, to the office of a State fund. There it is opened by a clerk who is receiving, possibly, \$115 per month. The report is filed and temporarily forgotten. The attending physician, especially if he has few industrial injury cases, or if he happens to be busy at the time, may delay the forwarding of his report, thus helping to postpone, in some instances, the day when compensation payments begin. Then, somewhere along the line of these underpaid clerks in the State's offices, some one commits an error; one of the reports is mislaid. Finally it is located, and after a lengthy delay, compensation starts.

Everything runs along smoothly for a time, and then compensation stops. Something has happened in the office, or perhaps the injured man has changed his address; for no one moves around more than does an injured man, and generally the more seriously he is injured,

the more often will he move.¹⁰ The receiver of awards may not know where to write to get his check. Finally, some one comes to his rescue, and he notifies the office of a change in address; or the office, in turn, finds its mistake and resumes payments.

Let us assume that the employer puts into the hands of the company physician the whole job of handling compensation cases. The physician, in private practice, can earn only \$5000 per year, but the company pays him \$10,000. An employee, an uninformed foreigner, has his right foot partially amputated. The company physician reports the 'loss of the great toe.' The award is placed at \$450, and not \$2000, the amount it should be. Finally, it dawns upon some of the man's friends that something is not entirely right. The special investigator has not been around, and will not appear for some time, inasmuch as he has many times more cases to investigate than he can handle properly. In the mean time, the injured man and his family may be without the necessities of life. One man who lost both a leg and an arm was without compensation for nearly a year. He lived with his wife and three children in two dingy upstairs rooms, with only store-boxes for a table, and chairs and old burlap sacks for a bed.

Let us consider the case of a man working for a company which carried self-insurance. His left arm was caught in a great machine. It was literally wrenched from the socket, the whole shoulder was strained, the spinal column affected. The company physician — it is an insult to the many reputable physicians who are doing meritorious work in the industrial field to apply the term

to this man — reported the loss of an arm at the shoulder. At the end of two months, the physician pronounced the man 'cured,' the temporary total disability payments were discontinued, and award proper started. Needless to say, he was not cured, and he never will be cured. The physician had no good reason for pronouncing him cured. Being asked how the man would live, the physician admitted the seriousness of the injured employee's condition when he said, 'If he can't earn a living, let the d— fool die.'

That the above conditions are also to be found where private carriers provide insurance for the employer cannot be doubted. One needs only to consult the Conner Report of the investigation, conducted for the Governor of New York State, in relation to the management of the State Industrial Commission, to learn how some disabled workers fare at the hands of dishonest persons. In this report, it was shown how unscrupulous adjusters were able to force settlements far below the amount provided by law. Thus, in 114 cases, the awards as made by the adjusters totaled \$13,712. Had they been made properly, they would have amounted to \$52,280. This difference may be attributed partly to the dishonesty of the insurance adjusters and partly to the failure of State supervision.

It has already been suggested that those responsible for the administration of the laws are underpaid. This is due largely to the erroneous notion that it is not good business for the State to pay sums equal to those paid by private companies. Most of the State's employees come under civil service, but civil service has not remedied all the

evils of State employment. The third, or fourth, or tenth man down the list, if he happens to be of the right political complexion, may get the job or the promotion, regardless of the provisions of the civil service.

But while much may be said about the inefficiency of the routine workers responsible for carrying out the detailed provisions of compensation laws, the greatest difficulties arise with the holders of the more responsible positions. The low salaries paid to those who occupy these positions of authority, the lack of opportunities for promotion, and the odium of political maneuvering combine to drive away from the employment of the State those who are most competent. Some of the persons are connected with State funds, while others are in the general administrative offices, charged with regulating the activities of private carriers and self-insurers.

To make clear just how the Government may lose the services of competent officials, let us take the example of one Western State. When the compensation system was first inaugurated, every one was new at the task. By persistent efforts, certain capable men charged with the operation of the act at its inception succeeded in training a number of energetic and intelligent young persons, presumably with the idea that they would carry on the work in the future. But the salaries of the younger group were low and were raised but very little to meet the increased cost of living during the war period. Soon one left to join an Eastern insurance company at a salary several times what he had been receiving; then another left, and still another, and so on, until only one remained.

When a State goes into the compensation insurance

business, it does not change its policy in regard to the payment of low salaries. One would think that in such jurisdictions as West Virginia and Ohio, for example, where the State funds do business amounting to millions of dollars annually, the employers themselves would override the State's lethargy and demand, for those in charge of the business, salaries which would guarantee the proper administration of so enormous a fund. The members of the Ohio Industrial Commission, responsible for the conduct of the largest carrier of workmen's compensation insurance in the world, receive only a small per cent of the amounts paid to the officials of private organizations who hold positions that require no more capacity than that necessary for the efficient execution of the duties of an industrial commissioner. One very important reason for low salaries and shortage of help in State enterprises is the constant political 'bugaboo' about lower taxes and decreased Government expenditures. This always has been a favorite subject of the political aspirant who has nothing else to say.

Along with low salaries, the method of appointing officials to office has helped to impair the efficient administration of workmen's compensation laws. The tenure of employment is not stable. The election of a new administration may mean the loss of position to those officials of the wrong political affiliations. The industrial commissioners may not be affected because of their longer appointments and because the law usually stipulates that they shall not all be of the same political party; but the officials directly under them, heads of departments and the like, stand a chance of being re-

moved if they are not of the same party as the incoming Governor. If there is no legitimate excuse for dismissing them, a fictitious one will soon be concocted. The department will presently be open to attack and, sooner or later, a new department head will be in charge, competent or otherwise; but, good or bad, a friend of the administration. During the time in which this change is being made, the other employees are in a constant state of uncertainty and turmoil, and conditions are not the sort which encourage efficient work. Certainly, an official, if competent service is to be expected, must not be subjected to the uncertain destinies of political parties.

An indication of the defective administration of certain of our compensation laws is to be found in some of the activities of deposed officials, or those who resign because of low salaries. Let us take the case of an auditor, a claims manager, or a disability rating expert. An official holding one of these positions is forced out of a job by a change in the political situation. He has campaigned for the Governor who is about to leave, may indeed have obtained his job in the beginning by campaigning for him. Some one else has campaigned for the new Governor and he must be rewarded for his efforts. An opening must be created. The deposed official promptly opens up offices and makes it known that he is specializing in workmen's compensation cases. Even if he happens to reside in a State where resort to the courts is generally not necessary, he can still find plenty to do in looking up cases, in hurrying the proceedings, and in making himself so generally helpful that injured persons are willing to pay good sums for his services. It is not our intention,

here, to imply that, in helping injured persons to get their full award, these former State officials are not giving value received; but the mere fact that injured employees have to resort to this assistance, or think they have to do so, is a pretty good indication that the compensation system is not working smoothly.

Whatever may be said about the functioning of the compensation laws in their present state of development, nothing stands in the way of future progress as much as the attitude of some of those persons responsible for the administration of the laws. The Pharisaic satisfaction with things as they are, because they are so much better than they formerly were, has had a deadening effect upon the improvement of compensation methods. The agitation for reform, so marked between the years 1910 and 1915, has deliquessed almost to a stage of non-activity. This self-complacency in the things already accomplished has become so ingrained in the thinking of compensation officials generally, that future improvements are not only deemed unnecessary, but well-nigh impossible to attain. To suggest that the program of compensating injured persons has yet to undergo many changes is but too true.

Conclusion

In summary, we may briefly note at this point that the past eighteen years have brought notable changes in the treatment of the injured man and woman. In many respects, however, the compensation laws have been based upon guesses, rather than upon facts. What provisions of the laws are unscientific, and just where changes are necessary, can be determined only in the

light of actual experience. The operation of the laws for almost twenty years has yielded this experience. To the consideration of the lessons learned during this time, we shall now turn our attention.

CHAPTER III

FLAT-RATE DISABILITY SCHEDULES

A **DISABILITY** schedule is a table, used by those administering workmen's compensation laws, which shows the amount of compensation to be given for each type of injury. The amount of compensation, or the award, usually is not stated in terms of dollars, but in the number of weeks during which a certain per cent of average weekly wages shall be paid to the injured person. With the exception of Wisconsin, California, and New Hampshire, the States have flat-rate disability schedules.² They are so called because a flat rate is given for each injury, regardless of the age, occupation, or previous training of the disabled worker. In Ohio, for example, some of the awards are:

TYPE OF INJURY	AWARD IN WEEKS
Arm.....	200
Leg.....	175
Hand.....	150
Foot.....	125
Eye.....	100
Thumb.....	60

If an Ohio worker were to have his arm taken off at the shoulder, he would receive two thirds of his average weekly wage for a period of 200 weeks, whether he were 20 years of age or 60 years of age, or whether he were a laborer or a skilled mechanic. The amount of the award is qualified by the inclusion, in the law, of the provisions

that the maximum weekly award shall not exceed $66\frac{2}{3}$ per cent of average weekly wages, or a total of \$18.75. This means that if a skilled mechanic, receiving \$45 per week, were to be injured, his weekly award would not be \$30 ($66\frac{2}{3}$ per cent of \$45), but \$18.75.

Flat-Rate Disability Schedules are Unsatisfactory

One may search in vain for a rational basis for these flat-rate schedules. The New Jersey schedule, the first of its kind in this country, seems to have been based partly upon a scale of benefits used by personal accident insurance companies, and partly upon the awards for damages in personal injury suits. Some of the other early schedules may have been based upon medical ratings, but the schedules so resemble each other that one is forced to believe that one State simply copied another. What differences are to be found are probably due to legislative compromise.

The outstanding advantage claimed for a predetermined disability schedule is that it makes unnecessary a court trial or a 'higgling' to determine the amount of the award, except where other disputable points are involved. It does not follow from this, however, that the schedule itself should be based upon court decisions and compromise agreements. To the extent that it is so based, the compensation system is defective.

To many persons, these flat-rate schedules are entirely satisfactory. As one official, administering compensation, put it: 'We get along all right with them, so why tinker with them?' If this line of reasoning were to be generally applied, there would be little progress. The question is

not whether we have a condition better than that which existed before, although that is desirable, but whether we have the best possible system for administering compensation. Fortunately, there are some people who have never lost an opportunity to point out the defects in workmen's compensation laws. Thus, the late Dr. Carl Hookstadt of the United States Bureau of Labor Statistics said: 'Compensation laws in the United States have been enacted in too much of a hit-and-miss fashion. The benefits provided are based upon no recognizable principle and in most cases bear little relationship either to the needs of the injured workers and their dependents or to the loss of earning power resulting from the injury. This is especially true with respect to the compensation for permanent partial disabilities. Practically all of the American State laws provide a flat schedule of benefits and do not take into consideration either the age or occupation of the injured worker. California is the single exception.'

Dr. E. H. Downey, late compensation actuary of the insurance department of Pennsylvania, in speaking of the disability schedules, said: 'All existing schedules are founded primarily upon medical ratings of physical disabilities modified by legislative compromise between opposing interests.'

Over eight years ago, in introducing the subject of disability rating at the eighth annual meeting of the International Association of Industrial Accident Boards and Commissions, Mr. F. W. Wilcox, of the Wisconsin Industrial Commission, said: 'The rating of permanent partial disabilities is a matter to which every State must

give attention. One cannot administer compensation without realizing the fact that these definite flat-rate schedules that allow a certain number of weeks for this particular injury and apply alike, in all occupations, must have some modifications. If we are giving benefits to tide people over every kind of injury they have sustained, we must level them up in some manner according to their occupation, the thing that they have learned to do, their age, and their working prospects.'

The question of rating permanent partial disabilities has been discussed at practically every meeting of the International Association of Industrial Accident Boards and Commissions, the professional organization of those administering workmen's compensation laws. In 1921, the Association authorized its Committee on Statistics and Compensation Cost to formulate a standard disability schedule. The Committee began the work, but quickly found that reliable data were not available. That the several States did not have the data needed by the Committee was due, primarily, to the prevailing belief that the schedules then in force were satisfactory, and that, therefore, there was no need to collect information which might be used in the construction of new schedules.

The lack of funds undoubtedly prevented some industrial commissions from doing what they would have liked to do in the way of research. For various reasons, the States failed to coöperate in a uniform plan of record-keeping and to work coöperatively at a task which could be done much better by united action than by a single State. Whatever the reasons, there was, and still is, a

dearth of data dealing with the causes, extent, and effects of industrial injuries.

Data Showing Experiences of Injured Persons are Needed

The greatest need at the present time is data showing the actual experiences of injured persons as they are revealed in their everyday lives. It is one thing to ask a superintendent of an industrial concern, a trade union committee, or a welfare worker, honest as their opinions may be, what is the actual effect of any particular injury upon the future life of the injured person. It is quite a different matter to go to the injured worker himself, visit his home, and see, at first-hand, exactly what takes place — the difficulties he has to encounter, the reduced standard of living which in many cases he must accept, the loss of earning power, the disappointment resulting from unrealized ambitions, the loss of his skilled trade, and many other circumstances, the importance of which only those who have been injured can know.

A Case Study was Made

In order to learn what was actually happening, a study was made of a thousand industrial injury cases adjudicated under the Ohio workmen's compensation law. The major emphasis was given to such serious injuries as the loss of a leg or an arm. Such injuries are permanent, but usually do not result in total incapacity. Ohio was chosen because of its accessibility to the investigation and because of the representative nature of its industries. The problem is one which affects, not only Ohio, but every State.

Some States, it is true, would have a somewhat different class of workmen with which to deal. Washington, for example, would need to give considerable emphasis to lumbering, Nevada to mining, and so on; but the economic problem is essentially the same.

Preliminary to the study, it was necessary to obtain from the Ohio Industrial Commission a list of injury cases. These records of the Commission yielded the name, the address, and the age of the injured employee, the occupation at the time of injury, the wage, the amount of the award, and various other things.

The next step was to locate the injured person and, through a personal interview, ascertain his occupation, if any, after the injury, the wage, the amount of work lost as a result of the injury,⁵ the difficulties of employment, the effect of the injury upon the family's standard of living, and various other facts. Employers, physicians, and other persons qualified to answer were also consulted, in an effort to make the information as complete as possible. Thus a comparison could be made of the injured person's status before and after injury.

Any comparison must be based upon some sort of injury classification. Accordingly, the injuries are divided into six groups. Minor injuries are those affecting one finger only. Finger injuries involve two or more fingers. Eye injuries refer to the loss of sight in either eye and, in a few instances, to the partial loss of sight. Foot or leg injuries are grouped together, as are hand or arm injuries.

Effect of Different Injuries upon Skill was Investigated

The first question raised was as to the relative effects of these injuries upon the skill of the worker. Forty per cent of all the workers who held skilled positions before injury were obliged to pursue unskilled jobs after injury. Minor injuries had practically no effect upon skill. One third of the eye injuries forced the recipients to pursue an unskilled job. Slightly less than one half of the finger injuries, and slightly more than one half of the hand or arm injuries, caused a loss of skill. Over 60 per cent of those receiving foot or leg injuries were obliged to shift from a skilled to an unskilled occupation.

A similar way of determining the relative seriousness of the several types of injuries is to note how many of the victims of the various kinds of accidents are able to return to their old jobs and to their former employers. Practically all of those persons covered in this study who received minor injuries returned to their old jobs. Nearly three fourths of those sustaining the loss of a thumb were able to resume their old occupations. A little over one half of the victims of finger injuries returned to the same type of work, although 72 per cent of them returned to the same employer, some of this latter group being obliged to pursue new tasks suitable to their disabled condition. Sixty per cent of those disabled by eye injuries returned to the same kind of job, but 71 per cent returned to the same employer. Only one out of 10 persons who lost a hand or an arm was able to resume his old job, although employers took back about a third of them. Only one out of every 20 persons who lost a foot or leg was able to perform the same work. Employers took back nearly one fourth of this group.

Still another way of arriving at the relative seriousness of the different kinds of injuries is to ascertain the number of weeks of work missed during the healing period. The average for minor injuries was 7 weeks; for thumb, 8 weeks; eye, 15 weeks; fingers, 19 weeks; hand, 32 weeks; arm, 43 weeks; foot, 45 weeks; leg, 64 weeks.

Effect of Different Injuries upon Earning Capacity was Studied

Of all the factors considered in this study, that of loss of earning capacity is of most importance. If a crippled man is forced to take a less skilled job than he formerly had, that fact will almost certainly be reflected in his wages. If his disability seriously handicaps him in carrying on his old work, the degree of such hindrance will also be reflected in his post-injury wages. It is the amount⁶ of the pay check which, of course, determines his future standard of living—his home, the things he and his family eat and wear, the number and kinds of pleasures, the opportunities for advancement; in fact, everything requiring purchasing power will be limited by the amount of wages received by the injured breadwinner.

It may be advisable to consider some of the conditioning factors involved in determining loss of earning capacity. Average weekly wages are used as the standard. The problem thus becomes one of comparing pre-injury wages with post-injury wages. To illustrate: a carpenter, receiving an average weekly wage of \$40, loses his left hand. Because of the nature of his occupation, it will probably be impossible for him to continue at his old trade after having suffered such an injury. However,

there are other things which he can do. Suppose he becomes a janitor at \$20 per week. His loss in earning power has been 50 per cent. But this 50 per cent represents actual loss only in case there has been no appreciable change in general wage-rates, and particularly in the rate of wages being received by carpenters.⁷ But if wage-rates have so changed that carpenters are now receiving \$50 per week, then the actual loss in earning power has been, not 50, but 60 per cent.⁸ This method of computing loss of earning capacity was used throughout the study.

In Table 2 are given the data in 820 injury cases.

TABLE 2. AVERAGE LOSS OF EARNING POWER AND WEEKS' AWARD FOR SELECTED INJURIES

TYPE OF INJURY (1)	NUMBER OF CASES (2)	AVERAGE LOSS OF EARNING POWER IN PER CENT (3)	AWARD IN WEEKS (4)
Arm	127	46.6	200
Leg	87	54.9	175
Hand	180	36.2	150
Foot	104	40.1	125
Eye	98	17.4	100
Fingers	127	20.6	78
Thumb	53	4.3	60
Minor	44	2.6	27
All types	820	31.6	127.7

Column 3 shows the average loss of earning capacity for each of the eight types of injuries. Column 4 gives the number of weeks' award. Minor injuries cause practically no loss of earning capacity. Finger injuries result in about a 20 per cent loss. Hand injuries are less serious than are arm injuries; foot injuries cause less loss in earning power than do arm injuries; arm injuries cause less loss

than do leg injuries. Putting this in terms of weekly wages, it means that, if the average⁹ worker in the group earning \$40 per week were to sustain the loss of a hand, he would lose in future wages \$14.48 per week; if he lost an arm, \$18.64 per week; a foot, \$16.04 per week; and if he lost a leg, his future wage reduction would be \$21.96.

Compensation Benefits are Based upon Guesses, not Facts

Even a cursory glance at Table 2 will show that the amount of the award is not proportionate to the loss of earning power. This is the same as saying that the flat-rate schedules are out of harmony with the facts of industrial life, and recalls the statement of Dr. Hookstadt that 'the benefits are based upon no recognizable principle.'

In order to bring out clearly the inconsistencies in the flat-rate schedule, the awards given for different injuries will be correlated on the basis of loss in earning power caused by the injuries. That is, each injury will be rated in terms of all other injuries. The procedure is as follows:

Table 3, Column 2, shows that the average loss of

TABLE 3. AWARD COMPUTED ON BASIS OF OTHER INJURIES

INJURY USED 'AS A BASIS OF AWARD (1)	AVERAGE LOSS OF EARNING POWER IN PER CENT (2)	AWARD IN WEEKS (3)	AWARD COMPUTED BY COMPARING LOSS OF EARNING POWER WITH LOSS IN OTHER INJURIES			
			Hand (4)	Arm (5)	Foot (6)	Leg (7)
Hand.....	36.2	150	150	155.3	112.8	115.3
Arm.....	46.6	200	193.0	200	145.2	148.1
Foot.....	40.1	125	166.1	172.1	125	127.8
Leg.....	54.9	175	227.4	235.6	171.1	175

earning power suffered by persons who lose a hand is 36.2 per cent, and that the loss of earning power for those losing an arm is 46.6 per cent. The average number of weeks' award given for arm injuries is 200 (Column 3). In order to calculate the award for hand injuries on the basis of arm injuries, using loss of earning power as the determining factor, it is only necessary to resort to a simple proportion equation, with x representing the award to be found. The equation, on the data presented above, then is: $36.2:46.6::x:200$. Solving, x is found to be 155.3 (Column 5), and represents the number of weeks' award which would have been given to the person who lost a hand, had the hand injury been awarded as much for the loss of earning power it caused as the amount of award given for an arm injury on the basis of the loss of earning power caused by the arm injury.

Following the above method of computation, it will readily be seen that foot and leg injuries are underrated in terms of hand and arm injuries. Or, it might also be said that the hand and arm injuries are relatively overrated in terms of the foot and leg injuries. Thus, 150 weeks represent the period during which the award shall be paid to the person who loses a hand. But if the award for hand injuries was based upon the amount given for foot injuries, the amount would be only 112.8 weeks (Column 6), and not 150 weeks. If the hand award were based upon leg injuries, the award would be only 115.3 weeks (Column 7).

Foot injuries, which receive an award of 125 weeks, if based upon hand injuries, would carry an award of 166.1 weeks; if based upon arm injuries, 172.1 weeks; if based

upon leg injuries, 127.8 weeks. This means that foot injuries as compared with hand and arm injuries are grossly underrated, and that foot injuries as compared with leg injuries are but slightly underrated. The award given to the person who loses a leg continues for 175 weeks. But if this award were based upon the amount given for the loss of a hand, on the basis of loss of earning power, it would be 227.4 weeks. And if the leg award had been based upon the award given for the loss of an arm, it would be, not 175 weeks, but 235.6 weeks, or an increase of over 34 per cent! In other words, our compensation systems are based upon guesses, not facts.

The Dexterity Factor should be Taken into Account

Of lesser importance than the one just considered is the question as to whether, for right-handed people, an injury to a right, or dexterous, member will cause a greater loss of earning power than will an injury to a left, or non-dexterous, member. That is, if a carpenter who regularly uses his right hand to drive nails, saw boards, and so forth, should lose the use of that hand, would he suffer an equal, a lesser, or a greater loss of earning capacity than if he had lost his left hand? The foregoing injury cases throw some light upon this question.

In arm, hand, and finger injuries, the dexterity factor seems to influence the loss of earning capacity. On the average, the loss of a right hand or arm, or part thereof, entails a loss of earning power greater by more than 6 per cent (absolute) than does the loss of a left member. Foot and leg injuries show such a negligible difference as to lead to the conclusion that one foot or leg is no more dexterous than the other.

Workmen's Compensation Laws should be Revised

While only a few types of injuries have been considered in the Ohio investigation, inconsistencies similar to those just noted probably run throughout the schedule. They are to be found in practically every schedule, and in varying degree. They are to be found in some of the latest laws, as well as in the first. They are to be found where private insurance companies operate; where a State fund handles a part or all of the business; where employers are permitted to carry self-insurance. In short, the flat-rate schedule by its very nature is destined to present an illogical array of benefits.

The egalitarian principle of compensating injuries does not square with the facts of industrial life. Not all injured persons are of the same age, nor do they pursue similar occupations. Their powers of adaptability vary. Thousands of injured persons are being improperly compensated. Whether the man who loses a leg gets \$2000 or \$3000 may not mean very much to the person who has never been injured, but to the person losing that leg, it means a great deal. Both fairness and logic demand a revision of the flat-rate schedules.

Those who are interested in this phase of social insurance may feel like inquiring: How did these schedules ever get into our compensation laws? Why was not some study made to ascertain the relative loss of earning power for these various injuries before the rates were fixed? This is the answer: There were practically no data to use as a basis. The spirit of the times is well expressed in the words of one identified with the operation of an early compensation law: 'We were not interested so much in

getting exact awards, as we were in getting something started. Any award which will work and not be contested seems to be satisfactory.' When one recalls the deplorable condition that existed before workmen's compensation laws went into effect, he feels like agreeing that the principal thing needed just then was to get something started. But things have been started now for a number of years; long enough for scientific studies of the early laws to have been made, and their weaknesses to have been discovered. Surely the time has come when sufficient knowledge has been acquired to make possible a scientific revision of our compensation laws.

Conclusion

The data just submitted for the purpose of determining the correctness of the flat-rate schedules are not beyond reproach. It is frankly admitted that errors may have crept into the calculations. It is probable that these errors are neither very numerous, nor of such character as to change materially the final figures. But, to repeat, no claim is being made for accuracy to the final dollar.

In the following chapter will be described a compensation system which is not premised upon a flat-rate schedule, but rather upon a scale of benefits based upon such variable factors as age, wage, and type of occupation, which, along with the nature of the injury, condition the real loss in earning power.

CHAPTER IV

CALIFORNIA DISABILITY SCHEDULE

THE literature of industrial accident compensation in the years immediately following the passage of the first laws gave very little attention to injury benefits. This is not surprising when one remembers that the whole idea of compensation was new. The important thing was to get the program under way, and that required a great deal of careful attention. Some things had to wait, not only for more time, but for more experience. In short, refinements had to be postponed until another day.

Gradually, however, there began to creep into the annual meetings of the International Association of Accident Boards and Commissions discussions concerning the proper methods of computing compensation benefits. These discussions generally centered about the plan of paying benefits that had been adopted — and is still in use, although with some modifications — in the State of California.

The California Disability Schedule was Originated by Chance

The disability schedule, the pivotal point of the California system, had its origin in a casual argument over the relative hardships which the loss of a thumb would bring to a printer and to a day laborer. The argument led to an investigation which provided data for constructing

the schedule. Among other things, the data showed that the economic loss resulting from any particular injury would depend upon the age of the injured person, as well as upon his occupation, and that the size of the wage was likewise a factor.

The California System is Premised upon Loss of Earning Capacity

The California system departs from the idea of a flat financial remuneration. It is premised upon the assumption that the loss of earning capacity in any particular instance can be measured, and that the relative amount of the award in each case should be a sum which bears a definite relation to the loss of earning capacity. Thus, if Worker A sustains a loss of earning capacity of 50 per cent, and Worker B a loss of 25 per cent, the award going to Worker A, as compared to the award going to Worker B, is approximately in the ratio of 50 to 25.

▲ In analyzing the elements which enter into the problem of constructing a disability schedule, it seemed fairly clear to the California officials that persons suffering identical injuries need not be given equal compensation, and that the first thing to do was to determine what should constitute a reasonable requirement for a disability rating system. This requirement was defined as the amount of compensation necessary to enable an injured workman to adjust himself to his new condition. This idea later took the form of what is now called the 'rehabilitation theory' and assumed, what is obviously true, that an injured workman can or cannot regain his previous earning capacity. If he cannot, he must be pensioned for life. If

he can, he must be given financial assistance during the time required for rehabilitation.

The California system assumes that the average person will require about four and one half years in which to rehabilitate himself from a 60 per cent disablement. As an aid to him during this period, the law gives him what he would have earned in three years, had he remained in employment at the wages he was receiving at the time of injury. The payments are made to him at the rate of 65 per cent of the weekly earnings. If an injury results in a disability of 70 per cent, or over, it is assumed that the injured person cannot rehabilitate himself completely. Therefore a pension varying with the severity of the disability is necessary.

A Standard was Established

The first step in establishing the California plan was the postulation of a 'standard man.' Because the average age of workmen in California was 39 years, the 'standard man' was assumed to be a man 39 years old. His occupation was that of an ordinary unskilled workman — a sewer digger, for example, because a sewer digger is required to use all parts of his body, but no part has to receive any special training to perform the work. The next step was to decide the degree of disability attending this standard man if he sustained the loss of his major arm at the shoulder joint. This was *assumed* to be 60 per cent.¹ Since the Compensation Law of California required that an award equal to 65 per cent of wages for four weeks be paid for each 1 per cent of disability, the award for the standard man who lost his right arm at the shoulder joint

became 65 per cent of pre-injury wages for a period of 240 (60 × 4) weeks. Thus, four variables enter into the determination of the award: age, occupation, injury, and wage.

Injuries were Given Disability Ratings

Once having postulated a standard man, it became necessary to consider not only the loss of an arm at the shoulder but every conceivable type of injury. Various methods were employed for this purpose. Some thirty leading physicians were asked for an opinion as to what could be the economic loss sustained by the standard man in each of some 300 different injuries. Next, the laws of the several States and of foreign countries were studied, to determine the respective awards given for each type of injury. This was not a difficult task. All that was necessary was to consult the flat-rate schedules and note the number of weeks' award given for the particular injury. The flat-rate schedules simply gave one award, irrespective of age or occupation. By noting how many weeks' award any particular State or country gave for injuries involving total disability, and then comparing that with the award given for some specific injury, it was easy to determine the percentage of total disability attributable to such injury.

Still other means were employed to determine the relative seriousness of injuries. A number of specialized treatises were consulted to get the opinion of authorities.² Use was also made of the disability ratings employed by private insurance companies and by the United States Pension Bureau.

By way of illustrating the method by which the percentage of disability caused by any particular injury was determined, let us assume that the standard man lost a leg at or above the knee. The California officials arrived at a disability rating by the following process:

- (1) Average percentage of disability recognized by the laws of foreign countries for the loss of a leg 67.3
- (2) Average percentage of disability recognized by American State laws for the loss of a leg 50.6
- (3) Percentage of disability allowed for leg injuries in United States pensions 71.0
- (4) Average estimate of physicians whose advice was consulted in this connection 50.0
- (5) Average estimate of private insurance companies 46.7
- (6) Average suggested by California officials 50.0
- (7) Final decision — The loss of a leg at or above the knee by a common laborer, 39 years of age, shall be rated as a 50 per cent disability.

The same procedure was followed with all the other types of injuries.

An Occupational Study was Made

So much for the standard man and his injuries. But there still remained to be considered a long list of occupations other than common labor. Here was an immense task, and its solution was begun by making a comprehensive study of some 1300 types of occupations being pursued in California industries. It was necessary to study not only 1300 occupations, but also the effects of some 300 different kinds of injuries, upon a man's ability to pursue any one of these occupations. To make the study, a group of young college men was given special instruction and assigned to the task of gathering the needed information.

These investigators held conferences with employers, superintendents, labor leaders, and other qualified persons. Each investigator took a certain industry group, such as fruit canning, and studied the different occupations from the point of view of the specialized use of certain parts of the body, placing in one class those tasks with the same functional requirements. This was especially important. It is not the name of the occupation which is the determining factor in deciding whether a one-armed man can do a certain piece of work, but rather the bodily functions required. It was found that occupations could be grouped in classes based upon the similarity of required functions. Eventually, the 1300 occupations listed for study in the beginning were reduced to 52 classes. Thus in Class 4, for example, are the following occupations, all found to require similar movements of the person performing the work:

1. Metal-Working Annealers
2. Burlap Bag Cutting Machine Operators
3. Burlap Bag Bailing Press Operators
4. Beamers in Cotton Mills
5. Beef Washers in Packing Industry
6. Bobbin Frame Tenders in Hemp Factories
7. Buzz Planers in Planing Mills
8. Canning Machine Operators (Tamales)
9. Candy Maker's Helpers
10. Compound Mixers in Rubber Plants
11. Cube Press Boys in Sugar Refinery
12. Grinders in Porcelain Factory

To allow for the occupational variations for the same injury in the schedule, there were constructed 17 rating tables. This permitted 17 possible variations of the oc-

cupational requirement; but experience has shown that actually there is no injury group with more than 13 variations, and some have only 3 occupational variations.

Disability Ratings were Determined for Different Ages

Adaptability to a changed condition is dependent, in part, upon age. Because of this fact, it became necessary to determine disability ratings for different ages. It was assumed that a boy of 15 years would have complete adaptability, and that a man of 75 years would have none. It was further assumed that a 10 per cent disability at age 15 would correspond to a disability of 17.5 per cent at age 75. By linear interpolation, the intermediate values for intermediate ages were determined. Thus, a common laborer who lost a major arm at the shoulder would be given the following disability ratings at the designated ages:

AGE	PERCENTAGE OF TOTAL DISABILITY	AGE	PERCENTAGE OF TOTAL DISABILITY
19	54.3	49	62.2
25	56.1	59	65.1
29	57.2	69	67.3
39	60.0	75	69.1

It will be seen that the schedule proceeds upon the assumption that disability increases with age. As already stated, the California law prescribes four weeks' award for each per cent of disability, thus giving the older man a higher award than the younger man, on the grounds that his degree of adaptability is less than that of a younger man.

Finally, considerable attention was given by the Cali-

fornia officials to what has been termed 'the ability to compete in an open labor market.' A workman who loses a finger, or suffers a disfigurement which distorts the face, may suffer no immediate loss in earning capacity because of his injury; but that he may lose something in future competitive ability cannot be denied. If all workers were similarly handicapped, none might suffer the loss of such earning power; but because the employer, especially in dull times, has the choice of a number of prospective employees, he usually selects those physically most fit. Or, if the lack of orders or any other contingency necessitates dismissing part of the force, the individual with the physical defect, unless he is an unusually good worker, will quite likely be one of the first to be released.

The complete disability schedule, when completed, was printed and included in a book of some 75 pages, and was intended to be distributed to employers and insurance carriers so that they might independently arrive at the amount of compensation. But difficulties immediately arose. Some persons found the schedule difficult to understand. The seriousness of injuries was many times underestimated. Difficulties arose in adjusting claims. Finally, the actual work of administering the disability rating schedule was taken over entirely by the State Industrial Commission.

At the present time all rating is being done in a special rating department in charge of a rating expert and a medical examiner. The ratings are based upon the injured workman's application and the doctor's reports. This arrangement is of special advantage, because the rating

expert can test the ratings against actual experience and can suggest changes in the schedule where they seem wise.

As far as the amount of the award is concerned, most workmen fare no better in California than they do in other States. In fact, some of the Eastern industrial States actually pay larger benefits. This is because the scale of awards permitted by law in some of these Eastern States is greater than in California. But, under the disability schedule just described, the different types of injuries are probably more equitably rated than is possible with the flat-rate schedule. One stroke of the legislative pen in California could increase the size of the awards. Instead of allowing only four weeks' award for each 1 per cent of disability, the award might continue for eight weeks.

Conclusion

In conclusion, it may be said that the California plan of compensating injured workmen is diametrically opposed to the idea embodied in the flat-rate schedules. Whereas the latter takes the form of predetermined awards for damages, the former anticipates the return of the injured person to productive employment and attempts to pay benefits based upon loss of earning capacity. To accomplish this objective, the California disability schedule increases the size of the award as the age of the injured worker increases, and decreases it in inverse ratio to the degree of adaptability possessed by the worker, as indicated by his pre-injury occupation. Whether this method results in compensation commensurate with loss of earning capacity can be tested only

in the light of actual experience. This will be done in Chapter IX. In the intervening chapters other proposals will be examined in connection with a further study of the factors which condition loss of earning capacity.

CHAPTER V

BRITISH COLUMBIA WORKMEN'S COMPENSATION SYSTEM;

No survey of workmen's compensation would be complete without an analysis of the methods employed in some of the Canadian Provinces, though it may be a rather unwelcome thought, to some persons, that our neighbors to the north are in a position to teach us something about injury compensation. Some of the Canadian officials, realizing that there are many factors involved in determining injury awards, have incorporated these factors in their compensation laws. These are worth noting.

Moreover, though an injured workman in Canada may not receive a larger award than he would receive had the injury been sustained in an American State — the award may, in fact, actually be less — he gains through the fact that the benefits are paid at the right time and in such a way as to be most conducive to his retraining. This will be made clear by a brief analysis of the British Columbia system.

British Columbia Law Functions under Favorable Circumstances

One cannot get a good understanding of the British Columbia system without knowing the particular conditions surrounding the administration of the law. In British Columbia, a smaller number of cases is handled daily than in the average American industrial State.

Added to this, is the advantage that the working force responsible for the operation of the system, though perhaps not sufficiently large to satisfy every one, is more nearly adequate than the personnel handling the laws of the States. Appointments are for longer periods, salaries are somewhat better, political influence is probably less menacing. The result is that capable officials not only have been secured, but have been retained for long periods, thus assuring experienced administration.

Large powers are vested in the safety department, which is part and parcel of the compensation system. The rehabilitation of injured persons is handled largely by the same authorities that administer compensation. In short, more personal attention is given to the victims of industrial accidents than is usually given in this country. The injured man does not receive benefits and then suddenly become neglected, but he is assisted in various ways toward regaining his economic status.

The Occupational Factor is not Considered

An interesting and important fact is that, on the basis of similar data, California reached one conclusion as to the amount of the award for particular injuries, while British Columbia, in part at least, reached an opposite one. It will be recalled that the California law placed considerable emphasis upon the occupational factor, on the assumption that certain kinds of injuries received by persons in various kinds of occupations would affect in different degrees the capacity of these persons to earn a livelihood. In British Columbia the occupational factor as such is not considered, but rather the amount of wages

received at the time of injury is used as an index of one's powers of adaptability after injury. It is assumed that a person receiving a large wage has more mentality, experience, training, and so forth, than has a person who is receiving a small wage.

The Wage Factor is Important

The Secretary of the British Columbia Board concisely explains the underlying philosophy of the system of his Province by saying that: 'The degree of impairment [of earnings] will remain constant if the power of adaptability is lacking, but that degree will decrease as the power of adaptation increases. The power of adaptation is probably greatest with the most intelligent and high-priced workman, and with the young, and that power is probably least with the least intelligent and lowest-priced workman, and with the old.'

The decrease in the degree of impairment of earnings as the degree of adaptability increases, and as indicated by the increase in the scale of earnings, is recognized in the British Columbia disability schedule by rating the low-priced and presumably less intelligent workman somewhat higher than the high-priced and presumably more intelligent workman. This does not mean that the low-priced worker will actually receive more compensation than the high-priced worker. In fact, he usually will receive less, because the award is based upon the amount of the wage, as well as upon the degree of impairment of earnings. To give due recognition to the wages received by an injured person in determining his degree of impairment, the disability schedule, referred to as the 'Scale of

Impairment,' uses as a base a wage span of from \$27 to \$30. For example, if a workman 36 years of age sustained the loss of a leg below the knee, and if his weekly wages were somewhere between \$27 and \$30, his percentage of impairment of earning capacity would be 30.² The percentages of impairment of earning capacity for some of the other wages are:

WEEKLY WAGE	PERCENTAGES OF IMPAIRMENT
\$9 to \$18	33
19 to 22	31.8
23 to 26	30.9
27 to 30	29.75
35 to 38	28.50

Thus, if a workman earning \$24 per week sustains the loss of a leg below the knee,³ he is given an impairment rating of 30.9 per cent. Since his monthly earnings amount to \$104 (a month is considered as having $4\frac{1}{3}$ weeks), 30.9 per cent of this amount is \$32.14. That is, his injury (on the assumption of a 30.9 per cent loss in earnings) reduces his monthly earning capacity by this amount. The British Columbia law does not pay awards equal to the total loss of earning capacity, but specifies a monthly pension equal to 62.5 per cent of the impairment. Thus, the monthly pension in this instance is \$20.09 (62.5 per cent of \$32.14). This pension continues during the life of the disabled worker.

Age is a Factor in Determining Degree of Disability

Both laws recognize age as one of the determinants of disability, expressed in loss of earning capacity. But, while California very minutely graduates the degree of

disability according to the age of the recipient, British Columbia uses the age factor directly to determine the amount of the monthly pension. Since, under the British Columbia system, the award in many cases continues for life, it is necessary to use both age and life expectancy in determining the pension.

In applying the age factor, 40 is taken as the basic age. Claimants over 40 are credited on account of lack of adaptability, and claimants under 40 are penalized because of their greater adaptability. A worker 40 years of age is assumed to have a life expectancy of 28.18 years (according to the American Experience Table of Mortality). It is assumed that if the age were younger, the expectancy would be more; but as the adaptability would be greater, the impairment of earnings would in a measure be equalized. If the age were greater, the adaptability would be less; but the life expectancy would also be less and the impairment of earnings would again tend to be equalized. The award is computed by determining the present value of \$1 per month at age 40, multiplying by the sum of the monthly pension, and dividing the result by the present value of \$1 per month at the claimant's true age. These present values of \$1 per month for the various ages are codified in a table and can easily be consulted. The present value of \$1 per month at age 40 is \$166.16. This sum multiplied by the monthly pension (\$20.09) gives a total award of \$3338.15.⁴ But this is for age 40. To find the monthly pension at age 36, the true age of our hypothetical claimant, it is necessary to divide \$3338.15 by \$174.01 (present value of monthly pension of \$1 for a person 36 years of age). The result is \$19.18.

TABLE 4. PRESENT VALUE OF ONE DOLLAR (INCOME) PER MONTH AT SELECTED AGES ^a

AGE	TERM OF LIFE EXPECTANCY (years)	AMOUNT
15	45.50	\$205.02
20	42.20	198.03
25	38.81	192.26
30	35.33	184.55
35	31.78	175.85
40	28.18	166.16
45	24.54	154.90
50	20.91	142.03
55	17.40	127.20
60	14.10	111.90
65	11.10	96.33
70	8.48	80.79

^a Computed on a 5 per cent compound interest basis.

Concretely, this means that if a workman 36 years of age, earning \$24 per week, loses a leg below the knee, he is entitled to receive under the British Columbia plan a pension of \$19.18 per month for the remainder of his life. In this particular case the pension probably would be \$19 per month, the additional 18 cents per month being commuted to a cash payment of \$31.96.

When the pension amounts to less than \$12 per month, a few hundred dollars are usually paid in cash, and the balance given at the rate of \$25 per month until the total amount is paid. This avoids bookkeeping. In order to make a settlement of this kind, it is necessary to know the present value of \$25 per month for any given number of months.⁵ At any time a cash payment can be made and the new pension readjusted. This procedure is especially valuable in connection with vocational rehabilitation. If there is an opportunity to establish an injured man in

business or to give him special training, the funds can be made available. Or, if special emergencies arise, this arrangement is convenient. To get a cash payment, thereby decreasing the amount of the pension, the claimant must show good cause why such a policy should be pursued. This gives the compensation board an excellent opportunity to investigate the proposition, with the result that those lump sums which are granted are usually wisely spent.

Conclusion

A comparative study of the underlying principles of the California and British Columbia systems reveals almost every important controversial issue involved in the problem of rating injury cases for compensation purposes. Both plans are premised upon the idea that persons suffering identical injuries do not require the same amount of compensation, because their financial losses are not the same. Both plans recognize age as a factor to be considered in determining the amount of the award, although, as already explained, the use made of this factor is different. But here the similarity ceases. The plans are totally different in regard to the significance they place on the occupational factor.

California says in substance: Consider an injured worker's occupation at the time of injury. Its nature indicates the probable powers of adaptability of the injured worker with the resulting loss of earnings which he is likely to sustain.

British Columbia says: Occupation as a determinant of adaptability is impossible of measurement. Look at

the worker's wage at the time of injury. If the wage is relatively high, that fact is an indication that the recipient's powers of adaptability are above the average and his need for compensation correspondingly less.

Which of the above ideas is sound? It is a question of the proper method of measuring adaptability after a person has been injured. In Chapter IX additional data secured in the Ohio investigation will be analyzed in an attempt to discover which is the more scientific position to take on this most important aspect of compensation.

CHAPTER VI

UNITED STATES FEDERAL COMPENSATION SYSTEMS

THE United States Government has established several injury compensation systems. As each plan deals with a different group of persons, no two are alike. Because of its opportunity to benefit by the experiences of the States, and because of its better facilities for research, it was expected that the Federal Government would develop improved methods for dealing with injured persons. Whether this is so can be decided only by an analysis of some of these compensation acts.

United States Federal Compensation Act

The Federal Compensation Act was passed September 7, 1916, but it did not begin to function until about one year later. The theory underlying the law was that an employee of the Government suffering a permanent partial disability will probably be taken back to his former place of employment, or if that be impossible, to some other employment, and that his earnings from time to time can readily be ascertained. During the healing period, while total disability exists, the injured person is entitled to receive two thirds of his wages at the time of injury, subject to a maximum compensation of \$116.66 per month. After the employee is ready to return to work, his compensation amounts to two thirds of the difference in his earnings before and after injury. If he be

so fortunate as to return to his old position or to another position, at the old wage, he receives no compensation from the day he begins work. In the future, however, if, as a result of the injury, his total earnings are reduced, he is privileged to reopen the case, and by so doing may receive additional compensation. For determining earning capacity, the commission may require the employee to make affidavits from time to time as to the amount of his earnings. If a partially disabled employee refuses to seek work, or refuses to accept suitable employment, compensation is withheld during the period of such refusal.

Let us consider an actual case.² A postal service employee had his leg amputated. He was disabled for 63 days. For the first 24 days he was paid full wages; after that, compensation was paid for 36 days at the rate of \$2.23 per day. He then returned to work at his original rate of pay, and no additional compensation was paid. The cost of medical and hospital care was \$291.60, not including the cost of \$100 for an artificial leg. If, at any future time, this man should suffer loss of earnings because of the injury, his case could be reopened and additional compensation might be paid.

Those who were responsible for the passage of the Federal Compensation Act did not believe they were creating a model law. They saw a definite need and devised what appeared, at the time, to be the most practical legal solution, hoping, by subsequent amendments, to improve the measure. This hope has been fulfilled to some degree. On February 12, 1927, was approved the amendment which raised the maximum monthly award from

\$66.67 to \$116.66. This is in excess of even the most liberal State workmen's compensation laws, and has partially silenced the critics of the law.

The Federal Law has Some Objectionable Features

The principal objections raised against the Federal law have not been from the viewpoint of the injured worker. Rather, the law has been opposed because of the difficulties and cost of administration. The obstacles attending the follow-up work on the part of the Government are many. This is true because some injured persons must be carried on the record books for the remainder of their lives, their earnings checked from time to time, and corresponding adjustments in compensation made. As long as the employees remain with the Government, this is not so difficult, although even then it is costly. But when the Government must keep a check on an individual after he goes into private employments, the obstacles are very great. Many people erroneously believe that this procedure is being followed in the California and British Columbia systems. They apparently overlook the fact that loss of earning capacity can be used as the basis for determining the amount of injury benefits without a perennial checking of post-injury wages.

There are other unsatisfactory features of the Federal law. One of these is the provision that the wage at the time of injury in all cases controls the amount of compensation, except for minors and those learning trades. That this procedure leads to a great deal of difficulty is apparent, for, as just suggested, any change in price-levels immediately alters the value of the award. If a

machinist who has been receiving \$4 per day before the inflation period, is injured so that he is unable to return to his old work, but is able to operate an elevator during the period of inflation at a wage of \$4 per day, it is incorrect to say that his earnings remain the same, if, in the meantime, machinists' wages have gone to \$8 per day. Conversely, under a falling price-level, an injured worker apparently may be suffering loss of earning capacity, and be compensated accordingly, when actually his real earnings have not been reduced.

In still another respect is the method of determining compensation faulty, to wit:² 'The law, in basing compensation upon wages at the time of injury, seems to make an assumption that the permanently disabled employee, unless a minor or learner, could not expect to improve his wages or occupation; that the unskilled laborer would always remain unskilled; that the skilled laborer would never advance in wage. This, of course, assumes a limitation of opportunity wholly inconsistent with American experience, as the average man or woman increases his earnings up to 35 and often up to 40 years of age.'

Finally, an injured Government employee may fail to receive compensation proportional to his financial losses because of his ignorance concerning the provisions of the law. As noted above, an injured Government employee, by submitting evidence from time to time showing the amount of his post-injury wages, can obtain changes in the amount of his pension. If he fails to do this, he is the loser.

Sometimes an injured employee is able to return to his old work with no loss of earning power, but suffers a

reduction in his total annual income because he is unable to pursue some auxiliary occupation, the returns from which have been used to supplement the regular income. A case in point is that of an unskilled workman, 43 years of age, temporarily employed in a Government establishment at \$65 per month.³ In 1917 this man sustained the loss of two fingers of the left hand. After a sufficient healing period, he was able to return to his former place of work without any reduction in salary. His compensation benefits were accordingly discontinued. Under ordinary conditions, this would have been considered a satisfactory arrangement, but in this case it was not, because it happened that the regular trade of this man was making cigars, and it was only his desire to assist the Government in time of war that prompted him to make the change. Perhaps of still more importance was the fact that the man was a violinist and played during the evenings, thereby adding to his income about \$300 annually. This case affords an illustration of the hardships which may result when a worker is injured in a casual occupation, if that happens to be less remunerative than his regular occupation.

The Federal Compensation Law has been open to attack on the score that it gives no appreciable recognition to the problem of the rehabilitation of the injured worker. Since the law provides that no compensation shall be paid if no wage loss occurs, the injured Government employee knows that his retraining, if successful, will deprive him of future compensation, regardless of any inconveniences caused by the injury. Under such circumstances, rehabilitation is often difficult, if not impossible.

When the United States Government entered the workmen's compensation field, it had a splendid opportunity to set an example of good business methods to all of the States. It failed, however, to take advantage of the opportunity. The three commissioners responsible for the administration of the act were put upon a \$4000 per year salary. Other positions were filled at similarly low salaries. In still other ways was Government inefficiency shown.

Longshoremen's Compensation Act

The Longshoremen's Compensation Act (approved March 4, 1927) covers harbor workers of all types except the master and the ship's crew. It provides compensation not only for injuries and death but also for occupational diseases. Employers loading, unloading, or repairing vessels of 18 tons (net) and over are required either to furnish insurance or to give proof of financial ability to meet directly such awards as may be made by the administrative commission. An employer cannot be sued by an injured worker or his representatives unless the employee has failed to secure the payment of compensation required by the act.

No compensation is paid for the first 7 days of disability unless the incapacity lasts more than 49 days. The maximum weekly benefit is \$25 and the minimum, \$8. Medical and surgical treatment, medicine, and hospital services are furnished. Permanent partial disability is compensated on a schedule basis; total disability is compensated during its continuance; death benefits are payable until the widow remarries or the children reach 18

years of age. The maximum weekly benefits are limited to $66\frac{2}{3}$ per cent of wages, while the maximum total allowance, in any event, is \$7500. The United States Employees' Compensation Commission is responsible for the administration of this new measure.

There is no good reason why seamen should not have been included in the coverage afforded by the longshoremen's legislation. But the seamen's organization did not see fit to sanction the matter. It, like some of the railway organizations, is still reluctant to give up the possibility of an occasional large court award for a smaller, though certain, return provided for by compensation legislation.

District of Columbia Workmen's Compensation Law

After years of agitation, Congress in 1929 approved a bill to provide workmen's compensation for the District of Columbia. The bill extends to workers privately employed, the same protection as that afforded longshoremen by Federal statute. It is administered by the United States Employees' Compensation Commission.

A worker injured while executing his duty receives a maximum of two thirds of his pay, but not to exceed \$25 weekly, while he is incapacitated. A definite schedule of awards for various sorts of injuries is provided by the bill. A widow and her dependent children are protected if the worker-husband is killed, the maximum amount to be paid over a series of years being \$7500. Necessary medical and hospital attention are provided for the injured workman.

United States Veterans' Bureau Disability Schedule

Prior to 1924, the disability schedule used by the Veterans' Bureau was comparable to the average schedule used by the State industrial commissions. But on June 7, 1924, the President approved the World War Veterans' Act, which placed upon the Bureau the obligation of constructing a schedule of disability ratings in accordance with the following provisions: 'A schedule of ratings of reductions in earning capacity from injuries or combinations of injuries shall be adopted and applied by the Bureau. Ratings may be as high as 100 per centum. The ratings shall be based, as far as practicable, upon the average impairments of earning capacity resulting from such injuries in civil occupations similar to the occupation of the injured man at the time of enlistment and not upon the impairments in earning capacity in each individual case, so that there shall be no reduction in the rate of compensation for individual success in overcoming the handicap of an injury. The Bureau, in adopting the schedule of ratings of reduction in earning capacity, shall consider the impairment in ability to secure employment which results from such injuries. The Bureau shall, from time to time, readjust this schedule of ratings whenever actual experience shall show that it is unjust to the disabled veteran.'

In the construction of the schedule, neither age nor wage was considered. The criterion was earning capacity determined by the type of occupation. The only precedent for the schedule was the California system of rating disabilities; but, while the California schedule was based upon permanent disabilities, the Veterans' Bureau sched-

ule had to include both temporary and permanent disabilities. The schedule covers practically the entire range of human diseases and injuries. It is comprised of two tables. One includes the 'Occupational Ratings,' which consists of a series of injury variants for all parts of the body coördinated with the occupational requirements of the job at the time of enlistment. The variant so assigned determines the per cent of payments which will be made under Table 2. This Table 2 is sometimes referred to as the 'Disability Ratings' because it comprises over 1000 injuries and diseases, which are in turn subdivided on the basis of severity. The ratings are then shown in a multiple rating table.

The benefits paid under the Bureau schedule are liberal when compared with other schedules. Permanent partial disability awards are based upon loss of earning capacity and are expressed as a per cent of total and permanent disability as shown in the schedule. The usual monthly award given a veteran who is totally disabled is \$100, but for the loss of the sight of both eyes \$150 is paid; and if, to this impediment, should be added the loss of either limb, the award is increased to \$200 per month. This is a very commendable characteristic of the schedule. The fact that some persons may not only be so incapacitated as to be unable to provide for themselves, but may even require the paid assistance of others, has somehow or other not found its way into the State compensation laws.

Where disability is total, but only temporary, the monthly benefit for a man without wife and children is \$80; if he has a wife and no children, it is \$90; a wife and one child, \$95; and \$5 for each additional child. Further,

if the disabled person has a father or mother, either or both of whom are dependent upon him for support, then, in addition to the above amounts, \$10 is allowed for each dependent parent.

If death results from injury, the widow of the deceased, if she has no children, will receive \$30 per month; if she has one child, \$40 per month; and \$6 for each additional child. If there is no widow, but one child, the amount going to the child will be \$20; if there are two children, the amount will be \$30; three children, \$40; and \$5 for each additional child. A dependent father or mother receives \$20.

The schedule was reënforced by an enormous rehabilitation program for the retraining of disabled veterans. Millions of dollars were spent to retrain thousands of persons. In fact, as will be shown later, it was this immense undertaking which demonstrated the practicability of spending money in the rehabilitating of victims of industrial accidents. The allowances for training were \$80 per month for a single man, or \$100 per month for a man with dependents, plus such family allowances as \$15 for a wife, \$10 for one child, and \$5 for each additional child. In some instances, where the cost of maintenance and support was above the average, a larger allowance was authorized.

In order to give to every commissioned officer and enlisted man in the Army and Navy, together with nurses serving in these units, future protection, the United States Government, through the Veterans' Bureau, provided insurance (converted insurance) in multiples of \$500 against the death or total disability of any qualified

person. No one was permitted to take less than \$1000 or more than \$10,000. Unfortunately, many veterans of the War did not take advantage of this opportunity.⁵ Had all of those eligible for service insurance taken out policies in amounts of \$5000 to \$10,000, the future financial security of this group would have been greatly increased. If every industrial worker were given similar protection, many hardships now faced by disabled workers and their dependents, and the dependents of deceased workmen, would be avoided. Voluntary insurance is likely to miss those most in need of it; compulsory insurance protects all.

Conclusion

The United States Government, through its compensation systems, has probably added something to the progress of injury compensation in this country. By recognizing the California system in the construction of the Veterans' Bureau schedule, it has at least departed from the flat-rate idea of the State laws. It is regrettable that the District of Columbia act, the most recent of the laws, was copied largely from the unsatisfactory State laws.

CHAPTER VII

BENEFITS UNDER FOREIGN WORKMEN'S COMPENSATION LAWS

GERMANY had twenty-five years in which to experiment with workmen's compensation before any American State enacted similar legislation. Austria, France, England, and Italy, although their legislation is of later date, also have had considerable time in which to test their social insurance acts. In certain respects this experience in other lands has been productive of results. The injury benefits provided by the laws have been altered from time to time, as additional data show the relation between the amount of benefits and the number and kinds of dependents. The effect of benefits upon the standard of living has been studied more carefully than in this country. As a result, the English law now provides that either the employer or the employee has the privilege of asking for a review of the weekly benefits 'if the rate of wages in the workman's pre-accident occupation falls or rises by more than 20 per cent during the twelve months preceding the review, and [the weekly benefit] is to be correspondingly decreased or increased.'

Compensation Benefits are not Based upon Loss of Earning Capacity

Despite the changes in foreign workmen's compensation acts which have been made from time to time, certain undesirable features still remain which merit the

same type of criticism as that directed against American State acts. Most important of these undesirable features is that pertaining to the method of determining disability benefits. The pernicious 'flat-rate' schedules, so common in our State laws, find their counterpart in the European benefit 'scales.' In writing of these disability rating devices in 1916, Mr. Ferdinand Schnitzler, a former director of the Workmen's Accident Insurance Institute in Austria, said: "In inquiring into the origin of the scales in use, as, for instance, for loss of an eye, 25 to 33½ per cent; loss of the right arm, 75 per cent, etc., one will be surprised to find that none of them is based on systematic observation of facts, i.e., of the actual earnings made by persons who have suffered such injuries. At the beginning of compulsory workmen's accident insurance the insurance institutes had merely adopted the compensation scales contained in the insurance contracts of private insurance companies, but quite generally increased the rates of compensation. Likewise, the scales of the private insurance companies were not based on observation of actual conditions, but represent merely assumptions on which the two contracting parties have agreed. One is, therefore, mistaken in assuming that the usual compensation scales represent averages deduced from actual conditions, and that by small increases or decreases of the rates of these scales full justice can be done to the individual conditions of injured persons.'

There is Some Flexibility

The European flat-rate schedules, as the above quotation suggests, are not absolutely rigid. The schedules

used in France and Germany are not even legally recognized. The persons responsible for determining the degree of disability attending each injury simply use the schedules as a guide, and make the final award larger or smaller, as circumstances may warrant. By so doing, it is possible partially to allow for age, former occupation, aptitude for new occupations, and other elements which differ for different individuals. The deviation from the scale, however, is usually not sufficient to bring about an award which corresponds to actual loss of earning capacity. As one authority has put it: 'The variations from the average percentages of incapacity are, however, generally small, and the experts usually tend to follow closely the schedule, even where it is purely a guide, so that in practice, physical incapacity remains the principal factor in the evaluation of economic loss.'

In Italy the ratings in the disability schedule have imperative force, but since only the principal or key types of injuries are listed, the authorities are given discretion in the rating of large numbers of disabilities. Similar plans are followed in Bulgaria, Spain, Brazil, Argentina, Queensland, and South and Western Australia.

In almost direct contrast to the Italian system is that of England. The British authorities have no schedule. Each individual case stands on its own merits, and the degree of disability is determined by an inspection of the circumstances surrounding each injury. The only duty imposed by the law is that evaluation of disability must be based upon the reduction in earning capacity.

The workmen's compensation laws of Denmark and Finland are more specific in respect to rating disabilities,

in that they prescribe what factors shall be taken into account in determining the degree of incapacity. In Finland, for example, the injured person's age, sex, mentality, and skill are factors entering into the determination of the ultimate financial award.

Allowance is Made for Age

Additional elasticity in computing awards is found in most European laws in the determination of pre-injury earning capacity, upon which the award is computed. Thus, if a law provides that two thirds of annual earnings shall constitute the sum of the benefits for a year, it is necessary to determine just what were the injured person's annual earnings before injury. In determining the amount of these earnings, some regard is usually taken of the age of the disabled person. Since a boy 17 years old has not reached his full earning power, it would be unfair to pay him, over a period of years, compensation benefits based on his partial earning power. In order to give due weight to the age factor, the laws of some countries provide for a review of the case after a period of six or twelve months, at which time benefits may be increased. Germany divides injured persons into groups according to age. One class includes those under 16 years; another includes workers between the ages of 16 and 21; and the third class includes all of those above 21 years. By this means it is possible to allow for age differences in determining the degree of incapacity.⁴

Practically all of the European laws, at least as far as the underlying philosophy goes, are based upon the assumption that incapacity should be measured in

terms of the general labor market, and not on the basis of the occupation at which one happened to be engaged at the time of injury. While the reëducation of crippled persons was little practiced at the time the compensation laws were passed, the above assumption seems to harmonize with the present-day idea that most disabled persons, if they are not too badly injured, can return to industry and that, as far as their economic status is concerned, it makes little difference whether they pursue their former occupation or a new one. The important thing is the size of the pay check at the post-injury job, and not the particular nature of the job itself.

Methods for Determining the Award Vary

The estimation of the per cent of disability caused by any particular type of injury, even though it be correct, is not equivalent to the amount of the actual award. The amount of the total disability award is specified by law. For example, in Germany the award granted an injured person is 50 per cent of the daily wage of persons similarly employed in the community, but not exceeding three marks per day. If a German worker suffers a disability which causes a 50 per cent loss in earning power, the amount of the award is 50 per cent of what the award would have been, had the worker been totally disabled. Benefits are paid as long as the disability continues. In many cases this is for life. Whatever limitations apply to total disability benefits apply also to permanent partial disability benefits.

In France a partially disabled worker receives 50 per cent of the reduction in annual earnings suffered as a

result of the injury. In Italy the benefits amount to six times the reduction in annual earnings; in New Zealand, 58 per cent of reduction in weekly earnings, but payments cease at the end of six years. Roumania pays $66\frac{2}{3}$ per cent of reduction in annual earnings, plus a cost-of-living allowance varying from 50 to 200 per cent, according to the degree of incapacity. In Russia the rate of pension not only depends upon the degree of incapacity but also upon the resources of the injured person. In Spain permanent partial disability benefits are limited to one year's earnings. If the degree of incapacity for habitual occupation is less than 50 per cent (or 40 per cent for women and men over 60) it is not compensated.

In Great Britain, if weekly earnings are 50 shillings or more, the permanent partial disability benefits amount to 50 per cent of reduction in weekly earnings. If weekly earnings are less than 50 shillings, 'weekly payment bears the same proportion to the difference between earnings before and earnings after accident as weekly payment, if incapacity was total and not partial, would bear to earnings before accident.'

Lump Sum Payments are Sometimes Made

A majority of foreign laws permit the payment of disability benefits in the form of a lump sum or cash payment, but the conditions under which this may be done vary considerably. In France the workman may request a commutation to a lump sum of 25 per cent of the award, but if the total sum thus requested is in excess of 100 francs, the consent of the compensation judge must be obtained. In Germany a worker may petition for a

commutation of pension if his injury has not resulted in more than 20 per cent incapacity.

The British system makes it possible for an injured worker to receive a lump sum with which to purchase an annuity, although the size of this lump sum is limited to 75 per cent of the total pension. The employer and injured worker may agree upon a lump sum at any time, but such agreement must be ratified by the court, and the money used as the judge directs.

Conclusion

In summarizing the principles underlying the determination of benefits in European workmen's compensation systems, it may be said that, although there is not rigid adherence to pre-determined disability schedules, the deviations from the 'scales' used as guides are usually so slight that it cannot be said that actual loss of earning capacity is used as a basis for determining awards. Furthermore, there has been no disposition to change the laws in this respect. Professor Alfred Manes of Berlin sums up this position by saying:⁵ 'In the country of origin of social insurance, as in all the many countries which have copied the German legislation more or less closely, the system of benefits, even down to some of its most important details, is still governed by the same or almost the same principles in 1925 as it was in the first bills drafted between 1881 and 1889.'

Outside of the field of benefits, some desirable changes have been made in the compensation laws of Europe. The credit for these changes is in part due to a series of studies and writings by European students of social

insurance. There has been no lack of excellent treatises on some phases of the law, but the subject of benefits has so far been neglected.

Workmen's compensation insurance ought to serve the interests of the insured. Benefits, therefore, ought to be the center of the system. It is surprising that this question has received so little emphasis in injury compensation literature.

We may say, therefore, that while some valuable suggestions for American legislators and students of social insurance can be gained from a study of European compensation systems, not too much must be expected by way of example. The field is still an open one.

CHAPTER VIII

DISABILITY SCHEDULE OF THE INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS

At the eighth annual meeting of the International Association of Industrial Accident Boards and Commissions held at Chicago in September, 1921, the Association authorized the Committee on Statistics and Compensation Cost to formulate a standard disability schedule. This action was prompted by the fact that for the preceding six years there had been discussion as to how disability, both temporary and permanent, should be rated from the standpoint of compensation.

Those who regularly had been attending the annual meetings of the Association seemed to be in general agreement concerning the weaknesses of their compensation systems, but not until after the appointment of the Committee entrusted with the work, did differences of opinion arise which gave evidence of the fact that, after all, there was no unanimity as to what a disability schedule should include and how it should be constructed.

The members of the Committee, before attempting the actual drafting of a schedule, made a preliminary survey of existing schedules and methods of compensation.¹ Both American and foreign compensation systems were analyzed. While the majority of American State laws revealed little that was useful in the drafting of an ideal schedule, there is no doubt that the California system

furnished valuable suggestions. Certain characteristics of several of the Canadian systems were likewise helpful. As may be judged from the discussion in Chapter VII, very little was to be learned from foreign workmen's compensation laws.

The Committee's Report Consisted of Five Resolutions

The Committee entrusted with the task of constructing a disability schedule met during the course of the year and thoroughly discussed the subject. Apparently considerable time was spent in gathering data, because when the next annual meeting of the Association convened, the Committee presented a rather extended report, one that must have necessitated a great deal of time and study. The report consisted of five resolutions, four of which were adopted at the 1922 meeting, after considerable discussion and some disagreement. The fifth resolution was carried over and finally passed at the 1923 meeting.

The first resolution adopted read: *The schedule of permanent partial disability shall be for compensation to be paid after compensation has been paid for temporary total disability.* This resolution was favorably received inasmuch as 18 States had already been operating on this principle. The justice of the resolution is apparent. If a State pays a certain per cent of wages for 125 weeks to the workman who loses a foot, and begins this payment immediately after injury, the payment may cease before the injury has healed, thus allowing no financial assistance during the adjustment period.

The second resolution adopted was: *Compensation for permanent total disability shall be valued on the basis of the*

total disability for life. The purpose of this resolution was to have some of the States remove their maximum restrictions on total disability benefits, thereby recognizing the fact that if a person is totally disabled at 30 and remains so until his death at 70, his needs at 50, 60, or 65 years are just as great as, if not greater than, they are at 30 or 35 years.

The third resolution adopted was: *Compensation for permanent partial disability shall be valued as a percentage of permanent total disability.* With the exception of a few States, compensation is stated in terms of so many weeks during which the award shall continue, and not as a certain per cent of total disability. The Committee believed that the person who loses an arm carries that handicap through life, and his disability should be so considered. It is only by determining what part of total disability is represented by a particular injury that a proper relationship can be established for all of the injuries. For rating purposes, it amounts to giving injuries a common denominator.

The last resolution adopted was: *The permanent disability schedule shall be one designed to measure loss of earning capacity, considering all elements.* This resolution was especially significant because it directly challenged the flat-rate principle and called for a method of measuring loss of earning capacity. In the last analysis, it is this degree of earning capacity remaining after the accident, which decides whether the unfortunate victim is to be able to support himself and his family according to pre-injury standards, or whether the home life is to be sacrificed, the wife and children forced to work,

and poverty substituted for the former standard of living.

The fifth resolution, and the one provoking the most argument, was: *The permanent disability schedule shall be based upon the principles of variable rather than fixed factors. The variable factors to be taken into account shall be: (1) nature of injury; (2) age of injured employee; and (3) occupation of injured employee, including degree of displacement in industry.* There was little discussion about the nature of the injury. Age and occupation were the points at issue.

The Committee Believed Age should be a Factor

Following somewhat the same line of reasoning employed by the framers of the California schedule, the Committee came to the conclusion that age should be considered as a factor in determining loss of earning capacity. It will be recalled that, according to the California plan, the amount of the award increases at about a uniform rate with the age of the recipient. But whereas the line representing the age factor in the California law was a straight line, that portraying age, as the Committee saw it, was a broken line, containing five distinct breaks. For example, the percentage of disability for the loss of the major (right) arm at the shoulder was placed at 45 at age 25; 50 at age 30; 55 at age 40; 65 at age 50; 80 at age 60; 85 at age 70. These percentages were thought to represent definite changes in the economic status of the average workman. Beginning with 40, the age factor becomes increasingly important. Physically, the workman is on the decline. An injury at this time of life may

mean not only the loss of an occupation but a degree of difficulty not experienced by a younger man in securing another job. Therefore, from age 40 to 50, the percentage of disability was increased 10 per cent (absolute). From 50 years on, rehabilitation is most difficult; there is little opportunity for an injured person to reestablish himself. During the next decade the rate of increase in the degree of disability was assumed to be 15 per cent (absolute). From 60 on, there is little change, although the Committee added another 5 per cent (absolute) to the total per cent of disability for those sustaining an injury after reaching this advanced age.

The Committee's treatment of age did not meet with unanimous agreement at the ninth annual meeting of the I.A.I.A.B.C. Some of the members present believed that to pay an old man more than a young man was unsound policy. It was argued that a man 60 years of age, for example, had only a few more years to work anyway, that he had had his opportunity for earning and saving for a long period of years, while the young man of 20 had practically his whole life before him, and even though he possessed more adaptability, his total loss would be much greater, and therefore his disability rating should not be less. Despite objections, the Committee's recommendation was finally adopted.

The Occupational Factor was Excluded

That occupation as a factor in determining the degree of disability did not cause the discussion which centered about age was due to the fact that the Committee itself recommended that, for the time being, the occupational

factor should not be considered in determining the degree of disability attending any particular injury. The decision to exclude the occupational factor was due, in part, to the prevailing unfavorable opinion concerning the California system. The Committee believed the California schedule was in error in assuming the existence of standardized permanent occupations. Many persons, although they may be employed a large part of the time, have no regular occupation. In such hazardous industries as harvesting and lumbering, and, to a lesser degree, in businesses like the steel industry, there are likely to be many casual employees. Many of these unskilled workers pass from one industry to another. In fact, the nature of some types of work demands that laborers be employed only a part of the time. Therefore, it was thought unjust to compute the amount of compensation on the basis of the effect of the injury upon the earning capacity of the workman in the occupation he happens to be in at the time of injury, when that occupation may be only a temporary one, and perhaps not representative of the kind of work the injured person normally does.

It was also thought that the occupation was not a fair indicator of the worker's experience, training, education, and what may be termed his 'mentality.' These attributes were believed by members of the Committee to have more effect upon earning capacity than the nature of the occupation. A workman's power of adaptability depends most of all upon his mentality. A man well educated and highly trained, regardless of his occupation at any particular time, is likely to be able to retrain him-

self, provided the injury is not too serious and the age not too advanced.

A Disability Schedule was Constructed

After reaching a decision as to what factors should be included, the Committee was ready to begin the construction of an abridged disability schedule. It is interesting to note that the starting point was an idea borrowed from the California system. The first step was the establishment of a standard to which all other disabilities could be related. The standard selected was the loss of an arm at the shoulder by a common laborer 30 years of age.² The next question to be decided was the amount of earning power suffered by the average common laborer, 30 years old, who lost an arm. The answer to this most important question was: 'Frankly, the Committee does not know. Had the compensation commissions left a record of their permanent disabilities, we would now be in a better position to know the relative economic handicaps resulting from such disabilities.'

The Committee finally decided to consider the loss of an arm at the shoulder to the 'standard' man as a 50 per cent disability. Other injuries were then related to the loss of an arm.

The Occupational Factor was Finally Recognized

Although the Committee decided not to consider the occupational factor in constructing a disability schedule, and so reported at the 1922 meeting of the I.A.I.A.B.C., the idea was not lost sight of, and at the 1923 meeting the following supplement was offered to resolution num-

ber five, was voted upon, and was passed by a large majority: 'When the permanent disability is of such a character which peculiarly unfits the employee for the performance of the occupation in which he was injured or of any other occupation in which he was experienced, the benefits shall be increased to compensate for the excessive handicap to such a degree as may be determined by the commission, but not more than 25 per cent of the schedule allowances.'

This idea is somewhat similar to the procedure in the Ontario system, where the Compensation Board has considerable discretion in the granting of the award. It might also be noted that an amendment to the supplement was submitted which provided that, wherever the employee was able to return to work at a less reduction in earning power than anticipated in the regular schedule, the commission might make a deduction from the award up to as much as 25 per cent of the schedule allowances. This idea was disapproved, on the ground that the schedule would be inactive because the commission always would have to decide, within a range of 50 per cent, what award should be granted.

Corrections were Made for Age and Life Expectancy

Still another factor was considered by the Committee. In addition to the age and occupational factors, the compensation award was to be based upon the average weekly wages at the time of injury. But this weekly average for the normal worker increases up to a certain point (about the age of 40) and then decreases. Therefore, it was thought wise, in determining the amount of the average

weekly wage, to take into consideration not only the wage at the time of injury, but the expected future wage of the injured man, had he not been injured. This was done by constructing wage indexes showing the relative annual earning capacity of a workman from 15 to 74 years of age, and the period of life expectancy.⁴

Conclusion

Following the 1923 meeting of the I.A.I.A.B.C., interest in the subject of disability schedules seems temporarily to have waned. The Bureau of Labor Statistics, which had been financing the work of the Committee, at least in part, apparently has decided not to invest additional funds in the enterprise at the present time. Perhaps of greater significance is the fact that several individuals who in the past have been very active in promoting reform measures in workmen's compensation are no longer a part of the movement. The Committee did the work it was asked to do. The I.A.I.A.B.C., having no authority of its own, and equipped with only the powers of recommending, had to content itself with urging its own membership to do what it could by way of getting State legislatures to act upon the advice of the Committee. To only a slight degree have the legislatures responded. Nevertheless, the Committee's efforts seem to have been worth while. The weaknesses of the present laws were set forth in bold relief; the path of improvement was clearly marked.

CHAPTER IX

VARIABLE FACTORS IN DISABILITY RATING

IN Chapter III it was seen that the flat-rate disability schedules, now being used by the States in the operation of their workmen's compensation laws, fail to give a proper relative rating to injuries. That is, the awards for each particular type of injury bear little relation to the loss of earning power sustained by the person receiving the injury. In the same chapter it was suggested that any State might improve the character of its compensation system by reconstructing its flat-rate schedules, but that even then its system would still be short of what it might be if certain factors in addition to the nature of the injury were to be considered in the determination of the award.

The purpose of the present chapter is to examine these factors, and to determine to what degree they affect the loss of earning capacity in any particular instance. To this end, 800 injury cases (Ohio data) were studied to determine the effect of age, wage, and occupation upon the extent of disability resulting from industrial injuries.² Only the more important types of injuries were considered.

Loss of earning capacity is the essential thing in determining the amount of compensation. But in the past this loss has been only estimated. The value of an estimate depends upon the knowledge of the person making it. The fact that the various estimates made

have but few points in agreement seems to indicate that some of them are not in accord with the facts of industrial life. Therefore, it will be necessary to examine actual injury cases to discover what the exact loss of earning power due to accidents is.

Age is a Factor in Determining Degree of Disability

The first factor to be considered will be age. Does the older man suffer a greater loss of earning power than the younger man if each sustains the same type of injury? If the older man meets with a greater loss, how much greater is it? Does the loss of earning capacity increase at a uniform rate with the increase in age? Or are there five distinct breaks in the line representing the age variation factor, as suggested by the Committee of the I.A.I.A.B.C.?^a Or does age show a different relation to the loss of earning power from any heretofore suggested? To arrive at answers to these questions, the findings in the study mentioned above were analyzed with the purpose of determining the effect of the age of the worker upon his loss of earning power. Arm, hand, leg, foot, finger, and eye cases were studied under six different age groups, beginning with those under 20 years and continuing, at ten-year intervals, to those over 60 years of age.

Figure 1 shows the effect which age exerted upon loss of earning capacity. The average loss sustained by those under 20 years of age was only 20 per cent. For those workers in the next ten-year group, an additional loss of 4 per cent (absolute) was incurred, while in the following group a 6 per cent (absolute) additional wage loss re-

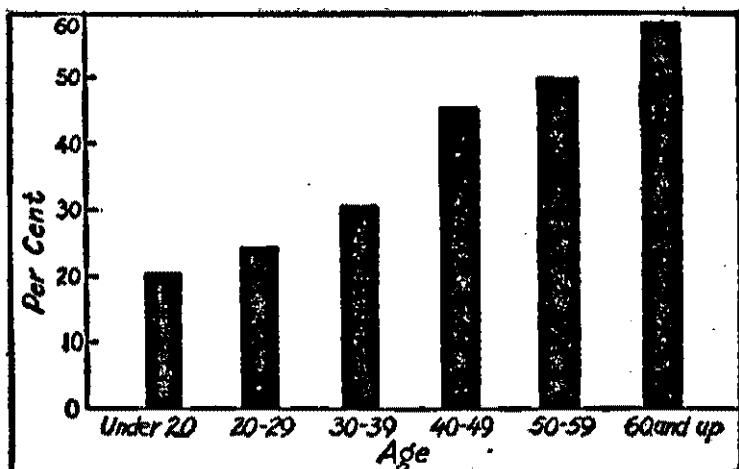


FIGURE 1. PER CENT LOSS OF EARNING CAPACITY SUSTAINED BY DISABLED WORKERS IN DIFFERENT AGE GROUPS

sulted. Beginning with age 40, the age factor became more important. The loss of earning capacity for the group of disabled persons between ages 40 and 49 was 43 per cent, an increase of 13 per cent (absolute) over the preceding age group. The next group (50 to 59 years) experienced an additional increase of 7 per cent (absolute), while the last group (60 years and up) increased 8 per cent (absolute) more, making a total loss in earning capacity of 58 per cent. The degree of disability, therefore, while it increased with age, did not increase at a uniform rate.

The loss of earning capacity as affected by age was not the same for all injuries. The average loss in the arm cases for a man of 60 years or over was 44 per cent (absolute) greater than for the worker who had not reached 20 years of age. For hand injuries, the difference in

absolute per cent was 43; foot injuries, 39; eye injuries, 37; finger injuries, 36; leg injuries, 44.

What light do these data throw upon the correctness, as far as age is concerned, of the systems already described? If a 19-year-old laborer in California loses his major arm at the shoulder joint, he is rated as a 54.3 disability. Had he been 69 years old, he would have been rated as a 67.3 disability — a difference of more than 13 per cent (absolute). Had the injured worker been a structural steel rigger, the ratings would have been, respectively, 47.1 and 94.1 — a difference of 47 per cent (absolute). It seems that, in so far as unskilled workers are concerned, the California schedule does not allow sufficient difference in the degrees of disability attributable to the low age groups as compared with the high age groups. This is probably due to an overemphasis of the occupational factor in disability rating. The California schedule errs, also, in assuming a uniform rate of increase in the per cent of disability as age increases.

The Committee of the I.A.I.A.B.C. was probably correct in assuming that an injury to a boy of 15 would result in about the same loss of earning capacity as an injury to a boy of 19 years, and that in neither case would the loss be so great as with those of more mature years. The Committee reached the conclusion that an injury sustained by one between the ages of 20 and 30 would result in a rather larger increase in loss of earning capacity than if it were sustained by one in the age group composed of those under 20 years of age. For arm injuries alone (the injury upon which the Committee made its calculations) the average decrease in loss of

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earning power (Ohio data) for those whose ages ranged between 20 and 30 increased only 4 per cent (absolute), as compared with the Committee's estimate of 10 per cent. The loss of earnings sustained by disabled persons (Ohio data) in the next age group (30 to 39 years) was 8 per cent (absolute).

Beginning with 40, the age factor becomes an increasingly important one in the economic life of the workman. The Committee of the I.A.I.A.B.C. allowed a 10 per cent (absolute) increase in the disability rating for those between 40 and 50 years. Although the Ohio data showed an increase of only 7 per cent (absolute) for arm injuries, the average for all injuries was 13 per cent (absolute); and for leg injuries only, it was 19 per cent (absolute). During the next ten-year period the Committee allowed a 15 per cent (absolute) increase in disability, although the Ohio data showed it to be only 8 per cent (absolute). For the last grouping, those of 60 years or above, the Committee believed there would be but little increase in the per cent of disability.³ However, the increase averaged 8 per cent (absolute) and ran above 15 per cent (absolute) for certain types of injuries. On the whole, then, it appears that the age variation is a broken line, rather than a curved one.⁴

There remains to be considered the British Columbia treatment of the age factor. There, it will be recalled, the total amount of the award is obtained by multiplying the weekly pension by the present value of \$1 per month at the claimant's true age. The age of 40 is taken as the pivotal point, and claimants over 40 years of age are credited because of lack of adaptability, and claimants

under 40 years of age are penalized because of their greater adaptability. This amounts to figuring the value of the award at what it would be at the age of 40, and then spreading it over the actual expectancy of the injured worker at any age. By this method a considerably higher pension is given to injured persons of 40 to 65 years of age than to those who are younger. While the British Columbia law thereby takes into consideration the increased loss of earning capacity of the older workers, it does not apparently give them enough advantage. That is to say, age 40 is not the proper dividing line; the per cent of increase in disability rises much more rapidly from age 40 on, than does the decrease in the degree of adaptability from 20 years up to 40 years. If the per cent of disability increased at about the same rate as the increase in age, as assumed in the California schedule, the British Columbia plan would give what might be termed 'average justice' to each workman, regardless of his age.⁵ Likewise, the recommendations presented by the Committee of the I.A.I.A.B.C. in this respect are valuable, and point out lines of improvement that might well be followed.

Females Suffer Greater Loss of Earning Power than Males

There is one more aspect of the age factor which may be briefly presented here. This has to do with injuries to female workers. The number of females injured in industry, as compared with the number of males, is relatively small. In fact, it was only during the first period of the Ohio investigation that any attention was given to

injuries of females, and then only a relatively few cases were investigated. The facts of importance in this connection are two in number: First, for the same type of injury, females sustain a greater per cent loss of earning power than males. Second, advancing age increases the degree of disability to a greater extent with females than with males. A serious injury to a woman beyond 45 years of age almost invariably means an industrial surrender.

Wage is not an Indicator of Adaptability

We now come to a consideration of wage levels as an indicator of one's ability to adapt himself to new conditions. The British Columbia system assumes that those persons receiving the highest wages are those who possess more mentality than those receiving lower wages, and that, in the event of injury, they can better adjust themselves to their new condition, and will not suffer as great a loss of earnings as those in the lower wage groups. This idea seemed to be in the mind of at least some of the members of the Committee which framed the schedule for the I.A.I.A.B.C. If this relation between mentality and wage-rates could be established, the need for taking occupation into account in establishing a rate would be eliminated. True, the wage would not designate the exact occupation of the injured person, but if it could be used as a key to one's powers of adaptability, it would be indeed a splendid criterion for disability rating.

The Ohio data shed light upon the relation existing between the wages received at the time of injury and the loss of earning power sustained as a result of the injury.

To the extent that the cases were sufficient in number and representative of injury cases in general, there was found to be no relation whatever between the amount of wages and the loss of earning power. That is, the person earning a high wage does not, on the average, possess sufficient powers of adaptability to prevent him from sustaining as great a per cent loss of earning capacity as that experienced by the low wage-worker.

The explanation of the fact that some workers, although possessing less mentality, receive higher wages than other workers, would carry us into the problems of wage determination and, in fact, into the whole problem of distribution. It is worth noting at this point that wages are based upon other things than mentality. The skilled carpenter or machinist receives a high wage because his type of skill is sufficiently limited in relation to its demand to bring high rewards for its services. The limiting factor may be due, also, to the strength required for a certain task, the ability to stand a great deal of heat, the willingness to pursue great risk, or any other inconvenience which tends to limit the number of persons willing to enter a particular line of work. A rubber worker in the 'pit' earns considerably more than do some other laborers who perform other tasks in the making of tires, not because he possesses more mentality, but because he can stand the heat and humidity, and has the physical powers necessary to perform the strenuous duties connected with that job, and these characteristics are relatively scarce. The furnace man in an automobile spring factory may be without much mentality and still make high wages, solely because the number of persons who

will stand before a fiery furnace is relatively small. A man grinding brass connections in an Ohio factory was making, in 1921, an average of about \$17 per day on a piece-work basis. It took less than a half day to learn that job. One day the regular workman at the machine was so injured by a crane-load of material that he could not return to his old job. His loss of earning capacity was considerable because he had little adaptability, being possessed of neither a fair education nor the native ability to learn. The only reason that one could earn \$17 per day on the brass grinding machine was that the job was extremely unhealthful and few cared to have it. In the same factory were tubs of oil into which hot bars were placed for tempering. The workers who handle the bars receive more money than a first-class mechanic. They have little adaptability, and if injured would suffer a considerable loss of earning power, even though they are capable of earning high wages at an unskilled job. These men are paid especially high wages because their work necessitates enduring a sickening odor of burning oil, the splashes of hot fluid against their faces, dirty clothes, smoky air, and a sappy floor.

Some skilled persons are temporarily in unskilled work because they are enticed there by high wages. If such persons should be injured, their temporarily unused ability would be of considerable assistance in obtaining a new job. Some workers, advanced in years, are able to make high wages because they still continue at their skilled trades, even after they reach 50 or 60 years of age. But if an accident of sufficient severity should befall one of them, his age would prevent his getting an equally good job.

Those persons earning less than \$25 per week suffer no greater per cent loss of earnings, if injured, than do those who earn considerably more. There are several reasons for this. First, there are more opportunities for a crippled person to find work at \$15 or \$18 per week than at \$35 or \$40 per week. Second, some employers seem to have a certain minimum, below which they do not care to go. This is well illustrated in a factory manager's answer to a paymaster's inquiry as to how much a crippled sweeper should receive: 'Give him \$20 a week; he's got to have that much to live on.'

Occupation is an Indicator of Adaptability

The California disability schedule recognizes the occupational factor in determining the degree of disability resulting from any particular injury. Bookkeepers are given more for finger injuries than are stevedores, on the ground that bookkeeping requires the use of fingers more than does the job of stevedoring. Since the aim of the California schedule is to correlate compensation benefits to wage loss, the occupation of the worker at the time of injury is regarded as a basic factor in determining the amount of the award. Unfortunately, however, the schedule, although it has been subjected to constant correction, still contains some rather serious inconsistencies. On these there is no use of dwelling; they are all of about the same general type. Just now we are interested in determining whether the factor of occupation has any bearing upon the degree of disability. This has been a controversial point, some maintaining — quite contrary to the California idea — that occupation has little

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or no effect upon wage loss; others admitting that it may have some effect, but holding that, since it is impossible of measurement, it must accordingly be ignored.

In explaining why wages are not indicative of one's power of adaptability after an injury, it was stated above that many unskilled workers receive high wages in spite of their lack of skill. This suggests that the adaptability powers of skilled workers are much greater than those of unskilled workers; but how much?

The Ohio injury cases again were used in an attempt to answer this question. The cases were first grouped according to the skill required, and then the per cent loss of earning capacity was determined for each group. The groups were three in number — unskilled, semi-skilled, and skilled.

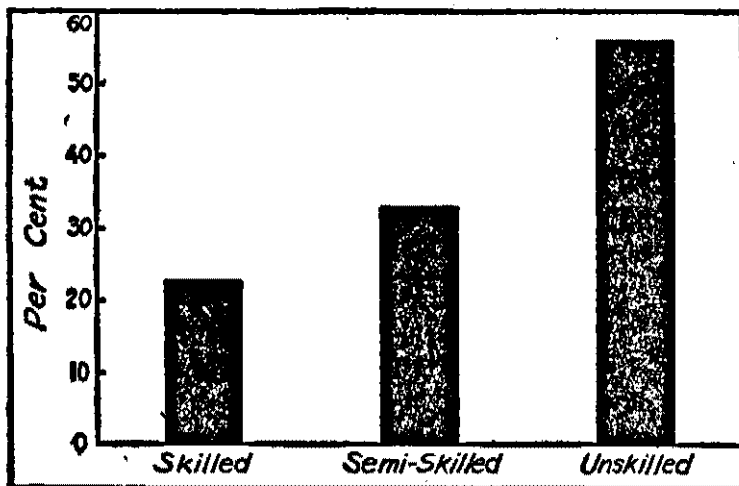


FIGURE 2. PER CENT LOSS OF EARNING CAPACITY SUSTAINED BY DISABLED WORKERS IN OCCUPATIONS REQUIRING DIFFERENT DEGREES OF SKILL

The skilled workmen with an average loss of earning power of only 22 per cent included old as well as young employees. In this group, even the older workers were fortunate in reëstablishing themselves. One machinist, 63 years of age, who lost his left arm, was made foreman of a machine shop; a skilled moulder who had his arm amputated above the elbow was made a foreman in his department; a construction foreman who lost his left arm was trained to be a bookkeeper and retained by the same company. That these men possessed the powers to take these other jobs accounts for their small loss of earning power. However, the writer believes another factor plays a part in this connection. The skilled workman — the foreman, the mechanic, and so forth — is closer to the employer than are those in less skilled positions. He knows the management and the management knows him. As one manager told the writer, in speaking of a skilled worker who had been injured in his plant: 'We simply had to find something for Phil to do.' Let a company show such interest and 'Phil' is much more likely to make a success of any new work given him than would be the case if no one took an interest in him. The rehabilitation service also assisted seven of the skilled workers in reëstablishing themselves, in six cases with the hearty support of the original employer.

In the list of unskilled workers who sustained an average loss of earning power of 54 per cent were many who had sustained the loss of a foot or leg. Many of these were workers advanced in years, over one third of them being past the age of 50. A teamster had his left leg crushed so badly under a loaded wagon that amputation

was necessary. While helping to unload steel from a car, another man had his right leg crushed. Another worker was 'lugging' material on a building job and happened to be too near an elevator when the hoist chain broke, and his leg was so mangled as to require amputation near the hip. Still another worker, while helping to sink a coal mine shaft, was unfortunate enough to have a huge rock fall upon his foot, necessitating amputation above the ankle. These examples could be duplicated many times. They tell the story of unskilled workers, advanced in years, and with little power of adaptability, left jobless after injury.

Semi-skilled workers suffered a loss of earning capacity of 32 per cent. Hand and finger injuries figured heavily in this group. The machine operator, a typical semi-skilled worker, by the nature of his tasks, runs the hazard of injuring his fingers and hands.

Occupations in a large measure have their concomitant injuries. A workman usually sustains an injury to those members which are actively used in the performance of his work, and this is prima facie evidence that these members are necessary. Either an injury is of sufficient seriousness to prevent a worker from pursuing his old occupation or it is not. If the worker must take up a new line of work, the question arises as to his ability to adjust himself to a new job. Skilled workers possess this power of adaptability to a greater degree than do semi-skilled or unskilled workers; and of the three groups, the unskilled are least able to adapt themselves. In fact, if they had the powers of adaptability, they probably would not be in the unskilled group, unless they were there, as al-

ready suggested, because sometimes more money may be earned by a skilled worker if he pursues an unskilled job. But it is not likely that there are many instances of skilled workers filling unskilled jobs if they could get as high a wage, or higher, at skilled tasks.

Due recognition of the age factor would solve many of the injustices supposed to result from failure to recognize the occupational factor. Age transcends mentality. A good rehabilitation bureau can train a worker not too advanced in years so that he can recover a fair share of his earning power in spite of his limited mental capacity.⁶

Conclusion

Of the three variables, age, wage, and occupation, age and occupation are important factors in explaining the degree of disability caused by an injury. While both of these factors are susceptible of measurement, age is the more so. Loss of earning capacity, the true basis of compensation benefits, can be determined only by recourse to variable factors.

CHAPTER X

AMERICAN REHABILITATION SYSTEM

IN the discussion thus far, emphasis has been placed upon the prevention and compensation aspects of industrial accidents. This has been the traditional method of dealing with the problem. When the number, causes, and effects of accidents have been carefully considered, the method of paying benefits properly analyzed, and the relative merits of the several different kinds of compensation systems discussed, legislators, students of social insurance, and representatives of insurance companies have considered the matter closed.

Within very recent times, however, there has been developing a growing opinion that accident prevention and compensation, desirable and necessary though they are, are not in themselves adequate methods of dealing with the problem of industrial injury hazards. We have already found that compensation in most cases does not continue over a very long period, and that many injuries continue to detract from earning capacity during the lifetime of the injured worker. With benefits limited both in amount and in duration, disabled persons are placed at a competitive disadvantage with other workers. One remedy, namely, to continue the compensation through life in these cases, has already been discussed. But it seems that some additional assistance is necessary. This is now being supplied by a program of vocational rehabilitation, which in its broadest sense means physical

restoration, vocational training, and placement. We shall first consider briefly the history of rehabilitation, then examine its methods, and, finally, evaluate it as a means of lessening the evil effects of industrial injuries.

Vocational Rehabilitation Began with the Smith-Hughes Law

The promotion of programs by the United States Government for the retraining of its disabled citizens has developed in a logical sequence, beginning in 1917 with the passage of the Smith-Hughes Law. This primal legislation, commonly referred to as the Vocational Education Act, provided a method for the training of normal persons about to enter, or after entering, employment. This Act is especially significant, not only because it was the foundation of the structure which was to follow, but because it marks the appearance of the Federal Board for Vocational Education, which was destined to play an important rôle in subsequent legislation of like character.

With the passage of the Vocational Rehabilitation Act on June 27, 1918,² the Federal Government inaugurated an extensive program for physical and vocational rehabilitation, designed to reestablish in civil life its disabled soldiers, sailors, and marines.³ By June, 1926, the Veterans' Bureau⁴ had retrained and returned to productive employments 90,000 ex-service men.

When Congress was considering legislation for the rehabilitation of disabled soldiers, there was considerable sentiment for including in the Act persons disabled in industry. Mr. James J. Davis, the United States Secretary of Labor, voiced the opinion of many when he said:

'We owe a duty to those men who offer themselves daily in the cause of progress and prosperity in our industrial system.' Although the time was not quite ripe for the inclusion of the civilian in a rehabilitation act, interested persons began presenting the argument that if the ex-soldiers could be rehabilitated, those disabled in industry could be, also. But the logic did not terminate there. If the industrially disabled persons could be retrained, then the same opportunity should be offered to those who were the victims of public accidents. Finally, those incapacitated because of disease or congenital conditions had an equally justifiable claim for assistance in establishing themselves productively. As this growing opinion crystallized, it challenged public attention and culminated in the Federal Vocational Rehabilitation Act of 1920,⁴ which provided a means for the vocational rehabilitation of disabled persons, whatever the cause of their disability.⁵

The three acts thus form a logical whole. The first may be regarded as an extension of our public educational system, and the second as a temporary device to meet a necessity arising out of the War. But the third is a remarkable innovation in labor legislation, which not only has an intimate connection with the whole question of compensation for industrial accidents, but which also offers possibly the only scientific approach to the problem of adequately dealing with all classes of disabled people. Not until 1920 was there a recognition of the fact that the latent resources of disabled persons represented a great potential productive power, which needed only to be salvaged in order that society might enjoy the fruits of their labor, instead of rationing to them the doles of charity.

To carry out the provisions of the new legislation, the duties of the Federal Board for Vocational Education were extended by an addition of a division for vocational rehabilitation.⁶ Congress provided an annual appropriation to be allotted to the States on the basis of population, but only on condition that the sum of Federal money spent should be met by a like expenditure of State funds.⁷ Before a State may be enrolled, it must first have its plan of procedure accepted by the Federal Board. The task of actually carrying on the work is left to each State, the National Government acting only in a supervisory capacity. By June, 1929, forty-four States were coöperating with the Federal Government in this joint rehabilitation program. The work is carried on in the various States under the general direction of the State Boards for Vocational Education, the rehabilitation bureau itself being a division of the State Department of Education or of the Labor Department, the former being the usual agency. The personnel of the bureaus ranges from a single director of rehabilitation, as in North Dakota, to a score of highly trained persons, as in New York State.

Nature and Method of Rehabilitation

The particular plans of rehabilitation must necessarily vary considerably from State to State, since some States are largely agricultural, others industrial. Approximately 90 per cent of the rehabilitation cases in Pennsylvania, and 70 per cent of those in New Jersey, arise out of a disability resulting from industrial employment. In Minnesota, probably not more than 13 per cent of the rehabilitants may be classed as industrial cases. A plan which

is found feasible in New Jersey or Massachusetts may not be at all practicable in Iowa or Arkansas. The Federal Board recognizes these differences and encourages each State to pursue the particular plan which seems most reasonable in the light of special conditions.

Wisconsin makes considerable use of its vocational schools, where between fifty and sixty different kinds of craft work are taught. Virginia has divided the State into a number of orthopedic centers, and through the help of these clinics is carrying on its program. Iowa is taking advantage of its numerous institutions of higher learning to retrain its cripples. Still other States, such as New York and Ohio, make use of social agencies.⁸ The States generally work through correspondence courses, tutorial classes, commercial and Y.M.C.A. schools, shop training groups, and any other agency which appears feasible.

The law defines rehabilitation as the rendering of a physically handicapped person fit to engage in a remunerative occupation. The goal is to adapt such persons by special training, advice, and assistance, to an occupation in which they may find employment. Dr. R. M. Little, Director of Rehabilitation in New York State, says: 'There is nothing magical, there is nothing miraculous, there is nothing omniscient in this new rehabilitation service; at best, all it can do is to bring to the aid of the disabled man the scientific and common sense resources of the community and the State by which, perhaps, he can be restored.'

Rehabilitation should never be regarded as the harbinger of a new birth for the aged, decrepit, and hope-

lessly crippled. Its most fertile field will always be found among those persons who have not reached an advanced age, as is evidenced by the fact that most of the rehabilitants are between 20 and 35 years of age. This does not mean, of course, that a man who is disabled at 50 cannot be retrained, but rather that his chances are considerably less than those enjoyed by a younger man.

Whether the trainee be young or old, the work of maintaining his morale, which is second to none of the aims of a sound training program, should begin, if possible, at the time the disability occurs. This does not mean that the trainee should be coddled along, searching for the mythical 'pot of gold at the rainbow's end.' It does mean, however, that he should be made to feel that he has a chance to be useful again, and that the possibility of his being so depends upon his own efforts, previous training, and education, as much as, and probably more than, it does upon the type of rehabilitation service available. A flexible organization, with an opportunistic approach and, if necessary, a paternalistic attitude, is essential for obtaining results from a rehabilitation program. Field workers and supervisors in this work continually assume duties which ordinarily would not appear to be in their field at all. Compensation adjustments must sometimes be made, lump sum payments secured, property bought and sold, business projects started; and occasionally, even domestic difficulties must be adjusted. Financial assistance, legal advice, medical attention, friendly counsel, and community standing are often necessary if the trainee is to be returned to employment. To analyze the individual in order to determine his education, experience,

ambitions, likes, and dislikes, to outline a plan of rehabilitation, and to keep the trainee working steadily on the plan, are some of the problems facing the rehabilitation worker.

Finally, the trainee must be placed in suitable employment, where he may demonstrate his ability to discharge his duties satisfactorily, as well as to receive remunerative return. There are two things to consider in this connection. They are: first, the desires of the person who is to pursue training; and, second, the possibilities for employment in the trainee's community. To persuade a lad with a fourth grade education, who has lost his limbs in a mining disaster, that it would be inadvisable for him to study to become an electrical engineer, or perhaps a lawyer, may result in the temporary discouragement of the youth; but, if wisely presented, it should lead the would-be rehabilitant to realize the advisability of training for the thing which he can do, and in which his community can guarantee him employment. In short, rehabilitation is primarily a case-work proposition.

Scope of Rehabilitation

In order to determine whether a system of civilian rehabilitation under Federal supervision is one of merit, some standard must be used as a basis for judgment. Shall the success or failure of this experiment in the conservation of human productive power be judged by the proportion of persons rehabilitated to the total number disabled? Shall it be a comparison of the funds expended with the earning power conserved? Shall it be on the basis of the rate of progress, as to both numbers rehabil-

itated and the cost thereof? Or shall some other test be employed?

It would seem that none of the above considerations alone is sufficiently inclusive for our purpose. The value of rehabilitation must be judged by its past accomplishments and possible future achievements, by its underlying principles, and by the many improvements wrought by experience.

The Federal Vocational Rehabilitation Act has not enabled all or even a majority of disabled persons to occupy remunerative positions. The Director of the Federal Board for Vocational Education has estimated that there are some 225,000 persons permanently disabled in the United States annually, and that of this number about 112,000 are handicapped vocationally. Making deductions for unusual disability, old age, and other detracting circumstances, the Director has arrived at a total of some 84,000 possible cases for rehabilitation in the United States annually.⁹ Various estimates have been made of the ratios of persons rehabilitated to those eligible, and these estimates range from 1 to 5 per cent.¹⁰

A study of the records of those industrial and civilian injury cases which, because of their nature, would seem to require rehabilitation assistance, would probably lead to the conclusion that the rehabilitation bureaus have not neglected any large number of persons who wanted assistance and could be trained.¹¹ Unquestionably, there are possibilities for improvements in some of the States, but to bring them about will require more study and more money.

Much work is being done by the State rehabilitation

bureaus which is not registered in the records showing the number of persons retrained or placed in suitable employment. Often some advice or assistance from a rehabilitation worker, or the mere knowledge that the State would help, has enabled a crippled person to take care of himself.

It can hardly be said that the average State bureau of rehabilitation is inefficient. If the number of persons retrained is not as large as might be desired, the reasons are often other than the inefficiency of the bureaus. A very serious impediment is encountered in the fact that some disabled persons are unwilling to submit to training. Especially is this true in those States in which major attention is given to public disease and congenital disabilities. The members of this group are likely to be retiring and diffident, and it takes considerable effort and persuasion to induce them to take advantage of a rehabilitation program. The States themselves sometimes limit the scope of the work, not always through actual legal restriction, but sometimes through the failure of the administration to take cognizance of the needs of the rehabilitation bureau. The wording of the laws sometimes precludes any extensive research, and renders satisfactory compilation of information difficult, thereby tending to check further extension of the service. Not all of the States have discovered that numerous social agencies, clubs, and fraternal organizations are usually willing to cooperate, and that they provide a valuable supplement to any rehabilitation staff. Then, too, the fact must not be overlooked that if a State employs only one person to assist its disabled citizens, the amount of the assistance must necessarily be limited to the capacity of just one

person. If two, five, or ten persons are employed, the amount of assistance can be correspondingly increased. The ultimate value of rehabilitation must be gauged by the results obtained in view of the number of persons engaged in the work and the amount of funds at their disposal.

The State bureaus have been too modest claiming their just deserts. Many times, after an individual has been completely rehabilitated, he has no very definite idea as to the identity of his benefactors. Unfortunately, the laws are couched in terms beyond the comprehension of the average person needing rehabilitation service. While the essential thing is the retraining of handicapped persons, ignorance of the fact that the Government is back of much of the work carried on by other agencies has detracted from the confidence of crippled persons in the rehabilitation efforts of the State government and has lessened public appreciation of the bureau's work.

The Federal Board has also been too modest about its achievements. To gain national appreciation of rehabilitation, a wider dissemination of knowledge on the subject seems necessary.²³ The standard college and high school texts may have something to say concerning workmen's compensation and accident prevention, but the number of texts that include any reference to the work of rehabilitation is still very limited.²⁴

Rehabilitation is Economically Justifiable

It is somewhat difficult to determine the financial gains which may be attributed to rehabilitation. Only recently has the Federal Government succeeded in getting the

different States to keep records. In the Hearings before the Subcommittee of House Committee on Appropriations in charge of the Independent Offices Appropriation Bill for 1925, when the Federal Government was being asked to renew its financial support for rehabilitation work, the request was made that evidence be submitted to show that, from a financial point of view, sums invested in rehabilitation work were being wisely spent.⁴⁴ Unfortunately, the amount of such information to be had was very limited. The request, however, had the effect of prompting some of the States to attempt to make a pecuniary estimate of the value of their rehabilitation services.

The data on the following pages represent one of these attempts to estimate the value of such services to injured people and to society at large. It is recognized that any data attempting to link pecuniary values with education, adaptability, and similar matters are liable to misinterpretation and are likely to be the subject of much controversy. It is also admitted that the question under consideration does not lend itself to mathematical exactness and statistical niceties. Only the absence of any other method of measurement has led us into a pecuniary valuation of rehabilitation.

The starting point of the inquiry as to the financial gains of rehabilitation was a comparison of the economic status of persons who had been rehabilitated with those who had not been rehabilitated.⁴⁵ In order to have comparative data, it was necessary to use industrial injury cases, or employment cases, as they are termed by the rehabilitation service, because data relative to non-

rehabilitated cases in public, congenital, or disease cases would have been difficult, if not impossible, to find. Of the total number of cases considered in this connection, 350 had not been reached by the rehabilitation service, while 350 had been retrained. All of the injured persons were male workers.

The cases were first divided into groups according to the type of injury. It was found that the loss of earning power of the rehabilitated cases was on the average 21 per cent (absolute) less than the non-rehabilitated cases. For finger injuries only, the difference was as low as 16 per cent; for hand or arm injuries, 22 per cent; for foot or leg injuries, 29 per cent.

In terms of average annual earnings, the rehabilitated cases had a distinct advantage. Whereas the average annual earnings of the non-rehabilitated cases amounted to \$828, those of the rehabilitated cases were \$1128, a difference of \$300. For foot or leg injuries alone, the difference was \$421.

Do these figures give any proof that rehabilitation does actually conserve earning power, or might it be argued that there was something in the make-up of the 350 rehabilitated workers that enabled them to adapt themselves to a retraining program, while the other 350 persons were so constituted, physically or mentally, or both, that they would have profited little from efforts at rehabilitation? Perhaps so, but let us continue the analysis a little further before making a final decision.

Because of the tardy appearance of rehabilitation, 184 of the 350 rehabilitated persons had succeeded, without rehabilitation, in getting jobs commensurate with their

disabilities. Without this assistance, they were earning an average annual wage of \$876. After they were rehabilitated, their wage was found to be \$1212, a difference of \$336. During this transition period, wages were not rising, thereby precluding the possibility of attributing any of this increase in earnings to rising incomes. Inasmuch as the only observable new factor in the lives of these people was the rehabilitation effected, it seems reasonable to attribute the increase in earnings to this cause.¹⁶

During the first six years of its operation, the Ohio Rehabilitation Bureau rehabilitated 240 totally disabled persons.¹⁷ Through this assistance, 138 males were given an average annual earning capacity of \$829, and 36 females, \$567, \$775 being the average for all of the cases. An increase in earning power from a few dollars, or nothing, to \$775 per year is adequate proof of the value of rehabilitation.

All of the data given so far are from Ohio cases. What of the other States? The Federal Boards for Vocational Education recently completed a nation-wide study of 6400 rehabilitation cases.¹⁸ Here is a summary of the findings:

	SKILLED	UNSKILLED
Average wage before disabled.....	\$28.85	\$19.71
Average wage after disabled.....	4.92	5.15
Average wage in rehabilitation job...	26.61	22.10

Let us return to the 350 Ohio rehabilitated cases discussed earlier in the chapter. Are we now to assume that the total average gains resulting from each rehabilitated case are represented by the sum of \$300? Were we to do

this, we should fall into the same error as do those who, in computing the value of a worker at any age, fail to take into consideration his period of work expectancy. A disabled person is not retrained for one year only. The fruits of his training remain with him during the years in which he is able to continue working. Of course, not all rehabilitated persons continue in the position for which they were trained. Some advance, while others retrograde, just as is true of normal persons. As rehabilitated persons grow older, they lose some of their earning capacity. But so do normal persons. It appears that the initial relative advantage which the rehabilitant enjoys remains with him during succeeding years.

The average age of the 350 rehabilitated cases was 29 years. Their average years of work expectancy would be about 20 years.²⁹ If rehabilitation enabled each of these persons to earn \$300 more per year, it thus will enable each of them to earn \$6000 more during the next 20 years. The total increase in earnings of the 350 persons would amount to \$2,100,000.³⁰

The total amount of money expended by the State and Federal Governments in the training of these 350 cases was \$45,038.50, or an average of \$128.71 for each case.³¹ On the basis of these figures, the cost of rehabilitation to the governments concerned was only a little more than 2 per cent of the probable increased earning power during the life of the rehabilitant. If the amount of assistance received from civic organizations, principally for maintenance during the training periods, is added to the government cost, the total expenditure would not exceed 6 per cent of the expected gain. Viewed from the money

standpoint, this is a very high return on an investment which, for non-pecuniary reasons alone, would be eminently worth while.

Some of the histories of the rejuvenation of injured persons read like fairy tales. To go over the records, to visit the disabled worker, to let him happily tell what has happened, gives to one a realization of achievement seldom surpassed in man's efforts to help his fellow men. The history of a few cases taken from various States' records may help to give the reader some idea of what rehabilitation means to a disabled worker:

1. A man lost both hands above the wrist when they were caught in a shredding machine. It seemed to every one, except a rehabilitation supervisor, as if his productive years had ceased. The disabled workman was fitted with a pair of artificial arms with hook attachments and given training to become a stationary engineer. He succeeded, and to-day is supporting his family unassisted by any one.
2. Mr. A lost both of his legs. The amputations were so high that it was impossible for him to wear artificial limbs. Following this catastrophe, Mr. A lost his wife and was left a cripple with three children to support. The rehabilitation service found him just as arrangements were being made to separate the children from the father. He was fitted with stump pads and given training in furniture repairing and is now able to support himself and his children.
3. A congenital cripple was found at the age of 19 with no earning power whatever. An operation was performed, an artificial limb provided, and a course in business training given. This triple service re-

sulted in this man's filling a position with a business house at an initial wage of \$115 per month.

Workmen's Compensation and Rehabilitation should be Coördinated

Workmen's compensation laws, at the time of their passage, did not anticipate the development of rehabilitation. Consequently, many of the present laws not only fail to encourage retraining, but in some instances hinder it. For instance, as some of the laws still read, a person who loses one major member through an industrial accident is placed at a disadvantage in being rehired. The employer knows that if a second major member is lost, he will have a 'total disability' charged against him, which will increase his insurance costs. This problem has been successfully met in some States by the creation of a second injury fund. In event of a second injury causing total disability, the employer is charged only for the second injury, the balance of the award coming from the fund.²²

Workmen's compensation laws would be of greater assistance to rehabilitation if they provided maintenance funds during the training period. Compensation benefits of from \$15 to \$20 per week are not sufficient if one has any dependents to support. Various remedies have been tried. The Wisconsin Workmen's Compensation Law provides, in addition to the regular compensation, maintenance funds of \$10 per week for a period of 20 weeks in cases requiring training prior to reinstatement on the job.

The Oregon Workmen's Compensation Law, by providing living expenses for the trainee and his dependents,

encourages injured persons to take training. An injured single man receives, in addition to his regular compensation benefits, \$30 a month as a maintenance fund; a married man with only his wife to support, \$55; a man, wife, and one child, \$60. Five dollars are allowed for each additional child, but the total that may be received is \$80. To provide the necessary funds, the Industrial Accident Commission sets aside 2½ per cent of its monthly income.

In New Jersey the permanent total disability award ceases after 400 weeks unless the worker shall have submitted to such rehabilitation as may have been ordered by the rehabilitation commission of that State.

Rehabilitation has raised a new problem in disability rating. The question now is whether the degree of disability caused by an injury should be determined definitely by workmen's compensation officials at the time of injury, or whether it should be rated after the rehabilitation bureau has trained the worker.

Money is needed at once to reestablish the injured worker in employment. To get it, the rehabilitation bureaus sometimes request that the injury be rated on the expected degree of disability after rehabilitation. This is questionable procedure, as shown in the following case:

A man had been so injured that the industrial commission regarded him a total disability. In his State, total disability benefits continue for life, and since the man in question was only 26 years of age, the total amount payable might have been considerable. The rehabilitation bureau petitioned the industrial commission to give the man the maximum award allowable for permanent partial disability (in place of the total disability award) and

commute the bi-weekly payments to a lump sum of \$3750, less interest. With this lump sum a down-payment was made on a hardware store, and the crippled worker was established in business. He is succeeding remarkably well, and in a short time will own the store free of all indebtedness. Had he failed, he would not only have lost compensation for life, but would have been without a means of support. The rehabilitation bureau should not be made to shoulder the entire burden.

Rehabilitation Depends upon Employer Cooperation

Unless a rehabilitated worker is self-employed, he must rely upon an employer for work. Some employers do not take their fair share of disabled persons. This is partly because there is no way to compel them to do it, partly because there is a belief that it does not pay to hire disabled workers. That it is possible to use crippled persons to advantage is seen by the experience of one of our greatest companies. The Ford Motor Company issued instructions in 1914 that no one applying for work should be rejected on account of his physical condition unless he were found to be suffering from a contagious disease which might endanger the health of his fellow employees. The rule was still in force in 1919. During those five years the company had not experienced any loss in efficiency, although it employed large numbers of disabled workmen. In 1918, when the average number of employees was 33,000, there were 9563 substandard workers. Of this number, 123 were minus a hand or an arm, 234 had had one foot or leg amputated, 207 were blind in one eye, 4 were blind in both eyes, a few were even working without hands, and still others were without legs. Ford employees

at that time were minus 1031 of their allotted number of fingers or thumbs. A careful survey of the Ford plants showed that 14,000 jobs might be occupied by persons disabled in varying degrees. There remained only the problem of adjusting the job to the man.²³

The Administration of Rehabilitation is Important to its Success

What is the proper agency for administering rehabilitation? In industrial cases, a strong argument can be made for having rehabilitation closely affiliated with workmen's compensation. In some States in which the department of labor is the supervising agency, however, the tendency is to retrain industrial injury cases and neglect others. Certainly there are no fewer public, disease, and congenital cases in the latter groups of States than in the former. Regardless of the department under which retraining is directed, the danger that some types of disability cases will receive undue attention at the expense of other types is always present.

If rehabilitation and workmen's compensation activities can be closely coordinated, it does not make much difference to what board or official the rehabilitation bureau is responsible. Some States seem to be getting along very well by having the rehabilitation service function as a division of the department of education. The success of such an arrangement, in so far as industrial cripples are concerned, depends upon the plan of cooperation between those administering the workmen's compensation law and those responsible for providing rehabilitation services. The working agreement between

these two agencies in the State of Minnesota is a good example of what may be done coöperatively. The agreement read in part:

'The department of labor and industries agrees to advise the division of reëducation and placement promptly of all cases of persons coming to its knowledge who have suffered injuries entailing impairment. The department also agrees to provide the division of reëducation and placement transcripts of such information in compensation records as may be requested. The department further agrees to make through the members of its staff any investigation requested by the division of reëducation and placement and distribute such printed matter.

'... The board [for vocational education] agrees to permit members of the staff of reëducation and placement to make investigations requested by the department of labor and industries ... the board further agrees that the division of reëducation and placement shall keep such records and supply such information relative to disabled persons as the department of labor and industries may desire.'

Conclusion

Rehabilitation has demonstrated its usefulness in dealing with the industrial injury problem. Any standard of measurement used so far reveals that it has helped disabled persons to earn a better living than otherwise would be possible. More than 40,000 persons have been rehabilitated in the United States since 1920. They are to be found in over 600 different occupations. Workmen's compensation laws need revising to enable them to assist

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the rehabilitation movement. The scope of rehabilitation can be extended by the expenditure of more money and the employment of more workers. Just how the money should be spent and what the workers should do depend upon a better knowledge of all phases of retraining — in short, upon more research.

CHAPTER XI

COMPENSATION BENEFITS AND DEPENDENCY

THE harmful effects of industrial injuries are not confined to the people who are injured. The majority of injured workers have persons either wholly or partly dependent upon them for support. These wives, children, or aged parents may be divided into two general classes, according to the cause of their dependency — either the death or disability of the wage-earner.

Death Benefits are Inadequate

There are a few scattered and unusual cases in which the dependents of a workman have succeeded in getting along better after his death than before, but the burden of proof is upon those who contend that the loss of the breadwinner is anything but the beginning of additional hardship for the widow and children, and a grave misfortune to the community. Nowhere are death benefits as large as the expected future earnings of the deceased worker, less the amount of his maintenance had he lived. It is evident that if the total death benefit amounts to only about three times annual earnings, which is the usual case, there must of necessity be a decrease in the family income, unless other members take the place of the former provider, or outside aid of some sort is forthcoming.

The thinking underlying the payment of death benefits has been influenced by a philosophy concerning the pre-

eminence of private property rights. When property values are placed first, all other values, including that of human life, must of necessity command lesser importance. Reduced to its simplest form, the matter of paying adequate death benefits amounts to the question of whether a relatively few widows and children on one side, or industry on the other, are better able to stand the financial burden of industrial deaths. The answer to this query ought to be quite clear. Just as the widow generally cannot assume the loss without adverse consequences to herself and to her dependents, just so industry can and should assume the burden; not a part of it, but all of it. Is it not true that, in any factory, a damaged machine will be repaired or replaced, unless it is no longer needed? Is it not likewise true that State agencies, in regulating public utilities, should and do allow for replacement of equipment in the rates fixed? Society seems to be able to compute fairly well the depreciation costs of a machine, or the value of a mile of railway track, but it has not yet versed itself in computing the value of a worker. As a former chairman of the California Industrial Commission put it: 'There is a pronounced failure to realize the value and importance of human life. In the hustle and bustle of business its loss is taken for granted, and totally inadequate steps are taken for its preservation as a rule. A shrug of the shoulder, solicitude at funeral time, and then forgetfulness of those facing a dark future constitute the three main factors in a partial picture of an industrial death.'

Provision for dealing with the dependents in industrial fatalities can be divided into two general groups, depending upon the method of paying benefits. There are those

countries which allow the payment of a lump sum to dependents, or a cash payment in full, and then those which require the benefits to be paid in the form of a pension. The former group, of which the chief representative is Great Britain, includes such countries as Italy, Japan, New Zealand, Australia Commonwealth and States, Spain, and Brazil.² The principal countries which follow the pension system of distributing death benefits are France, Germany, Hungary, Finland, Austria, Roumania, Poland, and Sweden.³ In Europe generally, the pension is becoming the favorite method of paying benefits, as evidenced by the following statement from one of the reports of the International Labour Office:⁴

'Half a century ago the payment in the form of a lump sum was the general rule; the private companies preferred this system because it enabled their financial obligations on account of claims to be determined quickly, precisely and finally, and their liability to be liquidated at a minimum of administrative expense.

'Workmen's compensation legislation has introduced the pension step by step, at first as a secondary mode of payment alternative to the lump sum, then as the principal form of compensation, with a greater or smaller faculty of commutation for a lump sum, and at least in certain countries as the sole form of payment.'

The total amount of compensation for fatal injuries depends upon the earnings of the deceased, and is expressed either as a fraction or as a multiple of the basic wage. In Germany, for example, the wife of a deceased worker is entitled to a pension equal to 20 per cent of annual earnings before death, plus an additional 20 per

cent for each child, but the total sum that can be received is limited to 60 per cent of annual earnings up to 1800 marks (\$429) and 20 per cent of the portion of annual earnings in excess of 1800 marks. If the pensions of the wife (husband, if the deceased wife has supported the family) and children do not exhaust the total allowable pension, other relatives may share the remainder, up to 20 per cent of annual earnings, in the following order of precedence: parents, grandparents, grandchildren.

The English system follows the family allowance plan. If any total dependents are left, such as a wife, parents, grandparents, or sister, the amount of compensation is limited to 300 pounds (\$1460), the judge in charge making the division. If any dependent children under 15 years are left, a maximum additional 300 pounds are available. The amount going to each child is found by taking 15 per cent of the product of the average weekly earnings of the deceased and the number of weeks which will elapse between death of the parent and the child's fifteenth birthday, average weekly earnings considered as being not more than 2 pounds nor less than 1 pound.

Various kinds of limitations apply to death benefits. In Denmark, the total amount is limited to five times the annual basic wage. Italy limits the annual pension to 30,000 lire (\$1578). In France, the maximum death award is 60 per cent of annual earnings up to 4500 francs (\$176), plus 15 per cent of that portion of annual earnings between 4500 and 15,000 francs (\$585), plus $7\frac{1}{2}$ per cent of annual earnings in excess of 15,000 francs.

Probably both Great Britain and Germany, at the inception of their laws, proceeded on the general assump-

tion that death benefits should be an insurance against that type of emergency. In Great Britain especially, it seems to have been taken for granted that if an employer had insured his employees to an amount equal to that for which a prudent employee would have insured his own life, but little more could be expected. In Germany, there existed probably much the same idea, except that in that country it was decided that a wiser use of the compensation might be made if it were distributed over a period of time. Experience has conclusively shown that workmen, as a class, cannot be relied upon to protect themselves adequately against future contingencies. It is a patent fact that the average workman carries very little life or accident insurance, often because his income is too small to pay premiums. In a study of 10,000 widely distributed and representative families, the United States Department of Labor found that the average annual premium paid for accident and health insurance by workers was only \$2.74, and that average annual benefits therefrom amounted to only \$1.⁵ In certain jurisdictions of New York State, it was found that only 13 per cent of the persons killed in industrial accidents carried insurance of \$1000 or more.⁶ In a study of 1000 consecutive cases, at the time group life insurance awards were made because of the death of the insured, it was found that:⁷

346 left no estate in the form of quick assets.

300 left less than \$500 each.

139 left from \$500 to \$999.

127 left from \$1000 to \$1999.

62 left from \$2000 to \$4999.

26 left \$5000 and over.

Because of this situation, many persons have argued that, since a worker does not carry insurance for himself and has made no other provision for meeting emergencies, the employer should not be obligated to do so. It is no credit to a workman that he does not carry insurance provided he is able to do so, but the way to correct this difficulty is certainly not to withhold from the dependents of a killed man a sum which should take the place of what might have been earned in future wages if the man had not been the victim of a fatal industrial accident.

Perhaps the Belgian plan is more nearly a satisfactory method of handling death cases than any other to be found in foreign countries. The only objection to this system is the small amount paid — only 30 per cent of the wages. Under the Belgian plan, there is collected from the employer at the time of the death of an employee, in a lump sum, an amount equal to the present worth of an annuity yielding 30 per cent of the wages of the deceased employee, calculated on the basis of the age at the time of death. For instance, the death benefits in the case of a Belgian 30 years of age, earning in American money \$4 per day, would amount, in a lump sum, to \$7059.60; if the age were 60 years, the benefit would amount to only \$3970.80. This is, generally speaking, as it should be. The young widow, with more dependent children than the widow at 60, will have a longer period of years during which she must support her family. However, it is true that an elderly widow is less able to earn her own living than is a younger woman.

In the United States, death benefits are limited by various restrictions. Minnesota, for example, limits the

weekly payment to \$20; the total award to \$7500. If a woman at the age of 30 loses her husband in an industrial accident, the maximum weekly award which she can receive would be discontinued before she became 38 years of age. If she had several children under 6 years of age when she drew the first payment, none would be able to care for itself when compensation expired; and if any of the children were still very young at the time of their father's death, they would not be self-supporting for some years after all compensation payments had ceased.

The New York law, in many respects the most liberal law of its kind in the world, pays the widow 30 per cent of her deceased husband's wages for life, or until remarriage. Ten per cent (absolute) additional is allowed for each dependent child, but the total to all dependents may not exceed $66\frac{2}{3}$ per cent of wages. The maximum monthly basic wage on which the death award is based is \$150.

The State of Washington allows \$35 per month to a widow or invalid widower, \$12.50 for one child, \$7.50 for the next youngest, and \$5 for each additional child under 16 years of age. Thus, if a widow were left with a large family and if the husband had not been receiving a very high wage at the time of his death, his dependents would fare better under the Washington law than under the New York law.

Pennsylvania limits the death benefit to from 15 to 65 per cent of wages for 300 weeks, but not more than \$15 is given in any one week. The important question in this State is: What will happen to a family after the 300 weeks have passed? Certainly no one can expect that any, or at

least any appreciable amount, of the benefit payments could be saved during the first 300 weeks. Nor is this period long enough, in many instances, to bring about any considerable change in the earning status of the family. Ohio prolongs the payments for two years and more beyond the time limit in Pennsylvania, gives $66\frac{2}{3}$ per cent of average weekly wages, and limits the maximum to \$18.75 per week. New Jersey's maximum percentage of wages is 60, the maximum weekly payment is \$20, and the total period over which payments run is limited to 300 weeks. California pays 65 per cent of wages up to three years' annual earnings, but then limits the total amount of the award to \$5000. Colorado pays 60 per cent of wages for 312 weeks, but partly nullifies the award by a weekly maximum of only \$12.

One of the most unique plans for paying death benefits, and at the same time one that is misleading, is that of Wisconsin. One section of the law states that the death award going to the widow shall be equal to 65 per cent of wages, the total to equal four years' earnings; the maximum yearly earnings to be \$1500, and the maximum weekly benefits to be \$19.50. Assuming a wage of \$30 per week, the death benefit normally would be \$6000.

Another section of the law ⁸ states that the death benefit 'shall not exceed the maximum amount which might have accrued to him [the deceased] for permanent total disability if death had not ensued.' Now a workman in Wisconsin who is totally disabled at the age of 30, or under, may receive total disability benefits of not more than \$19.50 per week, and for not more than 1000 weeks. In other words, he may receive benefits totaling \$19,500.

Since this sum is \$13,500 in excess of the maximum death award to the widow, the question arises as to how the total disability award could ever serve as a maximum for death benefits. This can be explained only in terms of an additional provision in the law.

The provision in question provides that the number of weeks during which total disability benefits are paid decreases from a maximum of 1000 weeks at age 30 to a minimum of 280 weeks at age 70. The total disability award also decreases, and at the advanced age of 70 years the total disability award is limited to \$5460 ($280 \times \19.50). The maximum death benefit going to the widow whose husband has been killed in industry is thus not \$6000 but \$5460. Only at the higher ages, then, does the total disability award limit the amount of the death award.

The sum of \$6000 does not always constitute the total death benefits in Wisconsin. If the deceased leaves a child one year of age, or under, or an incapacitated child under 18 years of age, the death benefits are increased by \$1500, provided maximum weekly benefits obtain; for additional dependent children, the award is increased by one fifteenth part of annual earnings (maximum \$1500) for each successor's yearly age up to 15 years. The maximum total death award going to a widow and dependent children thus depends upon the size of weekly benefits payable to the mother, and the number and age of the dependent children.

Inadequate Death Benefits Cause Serious Problems

That the present rate of compensation for death bene-

fits fails to meet the needs of the usual dependents, few persons familiar with the subject would deny. Just wherein the benefits fall short may not be so generally recognized. The Industrial Commission of California had available by 1920 information covering 674 cases of dependency due to industrial fatalities.⁹ In 1925 ninety-six similar cases were studied in Ohio. Although 770 cases are not as many as might be desired, they are probably representative of the problems which arise from inadequate compensation. The results of the analyses of the combined studies were:

- (1) Fifty-seven per cent of the dependent children at the time of the death of the family wage-earner were not over 10 years of age. In most cases these children would not be self-supporting when death benefits ceased.
- (2) Nineteen per cent of the wives were 50 years of age, or over, when they became widows.
- (3) Twenty-six per cent of the widows would be over 50 years of age at the time their compensation expired.
- (4) A fraction over 25 per cent more women were doing outside work after their husbands' deaths than before, of which number only about 13 per cent had previously done any outside work.
- (5) There was a decrease of 27.1 per cent in the number of families carrying on a separate family life. Children were scattered in orphanages, boarded out by public agencies, sent to live, often unwelcomed, in the families of relatives, or were adopted by strangers.
- (6) Before the death of the family supporter, 4.2 per cent of the families were keeping roomers or boarders; at the time of investigation, 20.3 per cent were keeping roomers or boarders.

- (7) Before the death of the family supporter, only 1.5 per cent of the families were dependent upon charity, private or public; when investigated, this number had increased to 17.6 per cent.
- (8) The death of the wage-earner, even though compensation benefits be paid, has usually been followed by a decided lowering of the standard of family living and, probably in about one third of the cases, has subjected the survivors to genuine hardships, or to dependence, in whole or in part, upon some type of public or private charity.

Several actual cases may be cited which plainly illustrate the utter inadequacy of the present system of paying death benefits:

- (1) A man of 65 had descended the industrial ladder by reason of ill health and advancing years, until he was glad enough to take a job at low wages as flag-man at a point on a city street where an interurban electric line crossed. While he was flagging a train, a heedless driver of an automobile ran over him and injured him so that he died. His widow had been a home maker and not an earner of wages, and her health was far from good. If she survives the four and a half years of the continuance of her death benefit, as she may by a decade, she must become a pensioner of public or private charity.¹⁸
- (2) A man 38 years of age, earning about \$50 per week at a job requiring more 'brawn than brain' was killed. He left a widow and eight children, the eldest being 12 years of age and the youngest 7 months. The widow had no idea how she might supplement the death award of \$15 per week. When questioned about the future she just wrung her hands and cried, 'What will I do?'¹⁹

Most persons find it difficult to visualize the uncertain needs of the future, and even when they are able to do so, the margin between earnings and necessary expenditures is usually not adequate to permit the saving of a sum sufficient for that 'rainy day' which may, after all, never come, although usually it does. Wages are generally so small that many persons find themselves unable to save, and certainly the average man who is killed at 40, or younger, has not had an opportunity to save enough to supplement the death award for the next 30 or 40 years. Life insurance in proper amounts would meet the situation, but it, like savings accounts, has been neglected.

Industry Should be Held Responsible

The heart of the compensation problem is not a question of ways and means of supporting children and widows, although that is important and is the ultimate goal. The essence of the problem is whether industry, in taking the life of a wage-earner, is to be made to pay the debt which it owes to the dependents. The State assumes the protection of its members; it is supposed to care for those persons unable to care for themselves. The State permits individual business men to enter into production enterprises for private gain. For the purpose of securing this gain, industry uses the citizens of the State.

Every capable workman is an asset to the commonwealth. Without him there would be no wealth, common or otherwise; nor would there be a commonwealth. When industry needs a man, it says to the State: 'I need one of your constituents; for his services I will pay a rent (wage). I shall never own him because he belongs to you.'

Now what industry has not said is that, in case the man cannot be returned in good condition, the State will be compensated for his loss. That is exactly what would be said, or at least implied, if we were talking about a machine instead of a man.

If a citizen is killed while serving industry, all of his future work capacity is lost. Since industry is responsible for his loss, it must make a payment; but how much? The answer to this question is the same which must be given if the machine which Y owns is destroyed while in the custody of X. X must give Y an amount equal to the value of the machine, which would be obtained by capitalizing the earnings of the machine, considering such factors as depreciation, cost of upkeep, rate of interest, and so forth. A workman at any particular age has a money value, which is that sum of money, together with interest, which would be sufficient to pay the worker's wages during the expectancy of productive life.

Statisticians of the Metropolitan Life Insurance Company have estimated that a workman 21 years of age whose earnings eventually will amount to \$2500 per annum has a present gross value of \$43,398. At age 50 his value would be less, because his period of life expectancy (and hence work expectancy) would be less. If industry were forced to pay such a sum in death benefits, it probably could do so. It would only mean that some persons would have relatively less purchasing power, while other persons would have relatively more purchasing power.

An adequate death benefit, however, would not need to be nearly so large as the sum just given. The requisite

amount would vary, of course, with the number and status of dependents. Children eventually are able to support themselves, unless they are disabled; wives, if they are not too old, are generally able to earn something, although sometimes only at considerable sacrifice. The capitalized value of a worker is based upon his full earnings, but after a worker is dead, he no longer needs to eat, be clothed, and so forth; in short, his expenses absolutely cease. The present worth of future personal expenses of the worker 21 years of age amounts to \$12,580, leaving only \$30,818 as representative of the present worth of (net) future earnings.

It is rather difficult to determine what portion of the annual income is consumed by the adult male of the family. The following data obtained by the United States Bureau of Labor Statistics show the ratio of food consumed by different members of a family: ²⁸

	FOOD CON- SUMPTION
Adult male.....	1.00
Adult female.....	0.90
Child 11-14 years.....	0.90
Child 7-10 years.....	0.75
Child 4-6 years.....	0.40
Child 3 years and under.....	0.15

If the above ratios are added, the total is 4.10 units for a family of six. Slightly less than 25 per cent of the expenditure for food thus went for the adult male. Professor Paul Douglas points out ²⁹ that while families of all classes now average nearer four members than five, the average working-class family includes not far from five members. It is this latter type of family with which we are here interested.

In a family with no children, the male consumes probably 55 per cent of the total income. Professor Horace Secrist found, for example, that in the restaurants of Evanston, Illinois, women spent only 86.8 per cent as much for food as did men. Figures obtained for relative expenditures in the mill villages of South Carolina virtually tally with the restaurant data.

Still other studies indicate that the larger the number of children in the family, the smaller the percentage of total income that will be spent by each of the parents. However, there are qualifying factors which must be recognized in an attempt to stipulate just how large the death award shall be in any particular instance. It appears that the following constituent parts would have to be taken into consideration:

- (1) There should be a sum for funeral expenses which will approximately meet the cost of a decent ordinary funeral. At the present level of prices, the usual amount provided (\$100 or \$150) is inadequate. The average cost of an adult funeral in the average workingman's family in 1925 was estimated as being approximately \$300.
- (2) Incomes should be provided (a) for each widow as long as she lives; or until she remarries, in which event, she should be given a lump sum payment equal to one year's compensation; (b) for each dependent child, until it reaches the age of 18 years; or if the child be disabled in any way, its income should continue for the period of such disability; (c) for such other persons as have been dependent upon the wage-earner.
- (3) The amount going to a widow with no children should be not less than 50 per cent of her deceased

husband's wages. The woman, as a member of a family, spends less than does her husband; but for a woman alone, if she is to maintain her customary standard of living, more than half of the former income will probably be required, because the expenses of a family are subject to decreasing costs. Light, heat, supplies, rent, and so forth, can hardly be cut in half. But since it is assumed that some widows, principally those in the younger age groups, will be able to earn something, at least for a while, half of the family's former income ought to meet reasonable needs, but less than that amount is likely to work some hardship in many cases.

- (4) The amount going to a widow with one child should be 60 per cent of her deceased husband's wages; to a widow with two children, 70 per cent; to a widow with three children, 75 per cent; to a widow with more than three children, 80 per cent. By allowing as much as 80 per cent of former earnings to a widow with four or more children, only 20 per cent is allowed for the expenditures which would have been made for the husband had he lived. This is very small, but it should be kept in mind that the average man's earnings cannot be represented by the size of the pay check. He does extra work around the home, in addition to his regular tasks, which, in his absence, will call for the hiring of some outside assistance.
- (5) In determining the average weekly wages on which to base the award, due recognition should be taken of the fact that, if the worker was young at the time of his death, his wages, had he lived, would have increased as he gained more experience. Also, it should be clear that the percentages suggested above are absolute and should not be mitigated by weekly or monthly maximums.

- (6) Whenever it is possible for a widow to do outside work, she should be given the proper training for such tasks. The same applies to any member of the family who is required to help support the other members. A sufficient sum of money should be made available to make this possible.

Permanent Total Disability Benefits Should be Larger than Death Benefits

A worker is considered permanently and totally disabled when he is so incapacitated as to be unable to pursue ordinary gainful employment. An individual minus both legs might still be able to do certain kinds of work, but from the standpoint of a compensation system with its benefit payments, such an individual is considered not only permanently, but totally disabled, as well. While the term 'total disability' usually applies to a workman who has lost the use of both arms, both legs, or both eyes, or perhaps an arm and a leg, many total disabilities are due to the fracture or dislocation of vertebræ and to fracture of the skull.

In countries other than the United States, the amount of compensation for permanent total incapacity is a fraction of the basic wage or a multiple thereof, according to whether the compensation is paid as a pension or a lump sum. Thus, in Germany and France, it is 66 per cent of the basic wage; in Italy, it is six times annual earnings. In every country there is some sort of a maximum placed upon the total compensation.

In the United States, the various State laws follow the European precedent of imposing some kind of limitation upon the amount of compensation paid for total incapac-

ity. As previously noted, 19 States pay a limited award during the life of disabled persons. The remaining States limit the amount by prescribing maximum periods during which payments shall continue, such as 520 weeks in Connecticut; or by limiting the total number of dollars which may be paid, as \$8000 in Wyoming; or by imposing both a weekly and dollar limitation, as 500 weeks and \$6500 in Pennsylvania.

A greater injustice is usually done to a totally disabled worker and his family than to the family of a worker who has been killed. Suppose an employee in Massachusetts 30 years of age, earning \$40 per week, is totally disabled by an industrial accident. He would be paid $66\frac{2}{3}$ of his average weekly wages for a period of 500 weeks. Instead of \$26.67, however, he receives only \$18, the maximum weekly award. This is 45 per cent rather than $66\frac{2}{3}$ per cent of his actual wages. The next thought is that this man's award would be \$18 per week for 500 weeks; but such is not the case, because \$18 per week for 500 weeks would make a total of \$9000, and the law imposes a maximum of \$4500. This amounts to saying that, while the compensation is technically supposed to continue for 500 weeks, it actually continues for only 250 weeks. This means that before the man reaches the age of 35 all compensation ceases, and he and his family are left totally unaided. If the injured person had been under the jurisdiction of the workmen's compensation law of New York State, the weekly award would have been \$25, because this sum represents the maximum weekly payment in that State. But this payment, while it represents only $62\frac{1}{2}$ per cent of the former wage, continues for life in New York, as it should in every State.

The prevailing reasoning underlying the payment of permanent total disability benefits is faulty in many respects, but particularly because it overlooks the fact that a different problem exists in the case of a person totally disabled than in the case of a dead person. Total disability benefits should be larger than death benefits because, first, the totally disabled persons, as well as the dependents, must be cared for; and, second, this care may involve expenses in excess of ordinary living costs. A man who has been made totally blind may be more than a 100 per cent disability as far as his family is concerned, because some one may have to be occupied, for a time at least, in taking care of him.

The amount of total disability benefits depends upon the provisions of workmen's compensation laws. It does not follow, however, that the basis of such awards cannot be put upon a rational foundation. The essential factors to be considered in laying such a basis are the following:

- (1) That a permanent total disability continues for life and should carry compensation for life.
- (2) That a totally disabled person's income ceases absolutely, and if the family's standard of living is to be maintained, the award should be large enough to make the customary standard possible.
- (3) That whenever a totally disabled worker dies and leaves dependents (that is, wife, children under 18 years of age, parents, and so forth), the award should continue during the period of dependency of these persons, but should be reduced by an amount commensurate with the cost of keeping the deceased, had he lived.
- (4) That the average weekly wage on which the award

is to be based should be computed with a view to what future earnings would have been, had the injury not occurred.

- (5) That whenever it seems feasible, the injured man, and in some cases his wife, should be trained for tasks which they can do, but their efforts in this direction should not be penalized by a reduction in the amount of the award.

Having attempted to show that the real financial losses resulting from industrial fatalities and disabling injuries are greatly in excess of the amounts represented by the size of benefits now being paid, we are ready to return to the problem of accidents with a due appreciation of its importance. The following chapter will be devoted to a discussion of eliminating accident hazards in industry.

Conclusion

The problems of industrial injury dependency are due mainly to inadequate benefits. Not only are injury benefits much less than the expected future earnings of the workers involved, but they are not determined with the view of meeting particular circumstances; they too often ignore the number and status of dependents. Many things are responsible for this situation, but the principal one is the failure to recognize the economic value of a worker. This fact has an important bearing upon the accident prevention problem.

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CHAPTER XII

ELIMINATING INJURY HAZARDS IN INDUSTRY

CAN all industrial injuries be prevented? Certainly not. Can the larger part be prevented? Perhaps so, if society is willing to pay a sufficient price. In Safety Bulletin 8 of the United States Steel Corporation, is found this significant statement: 'In carefully analyzing the causes of 100 accidents it will be found that at least 90 of them might have been prevented if a little more care had been exercised.'

The Committee on Elimination of Waste in Industry of the Federated American Engineering Societies came to the conclusion that: 'Experience indicates, and authorities agree, that 75 per cent of this loss [accidents] could be avoided. This would mean a saving of a quarter of a billion dollars yearly to employers, and a saving of half a billion dollars yearly to employees.'

That this view is shared by English authorities is shown by the following statement: 'That its work [accident prevention] is profoundly necessary, and the field for it large, is shown by the fact that Mr. Gerald Bellhouse, His Majesty's Chief Inspector of Factories and Workshops, states that 75 per cent of the accidents which occur, could, with reasonable precaution, be avoided.'

Can these and numerous other authorities all be wrong? Do the data given in Chapter I prove that, because accident rates in general are not being reduced, it is impossible to make industry more safe? Indeed, no! Let us

examine the records of some of the companies which have gone a long way in conquering the accident problem.

The United States Steel Corporation from 1906 to 1928 reduced its serious accident rate by more than 64 per cent, thereby saving 58,000 employees from serious injury. Although the expenses were very great, the company readily admitted that its safety program saved \$1,000,000 annually.

In a single year, the Oliver Iron Mining Company, a division of the United States Steel Corporation, reduced its accident rate 73 per cent. In the same length of time, the Bethlehem plant of the Bethlehem Steel Company reduced the number of days lost per worker because of industrial accidents 65 per cent.³ The Clark Thread Company, employing 5000 persons, operated 268 consecutive days without the occurrence of a single industrial injury. The Westinghouse Company of Pittsburgh operated 59 years with only 12 fatal accidents. The Fuze Division of the Du Pont Company accumulated 381,300 man-days without an accident, and operated for seven years with only one lost-time accident.

Other notable records have been achieved in the field of transportation. For the year 1924, the Union Pacific Railway system won the Harriman Gold Memorial Medal for safety — one of the most coveted of trophies. In that year the 'U.P.' operated four complete roads with a total of more than 53 million run miles, and had a casualty list of only 4 fatal and 12 non-fatal injuries.⁴ This company again won the trophy in 1925 and in 1927.

Railroads as a group have succeeded in cutting down the injury rate. The actual number injured during any

one year fluctuates with the number of passengers carried, but the trend has been steadily downward, as the accompanying chart. Thus, whereas the 1 trainmen killed in freight service for each 1000 was 4.4 in 1916, in 1926 it was only 2.0. There was a reduction of accidents in passenger service.

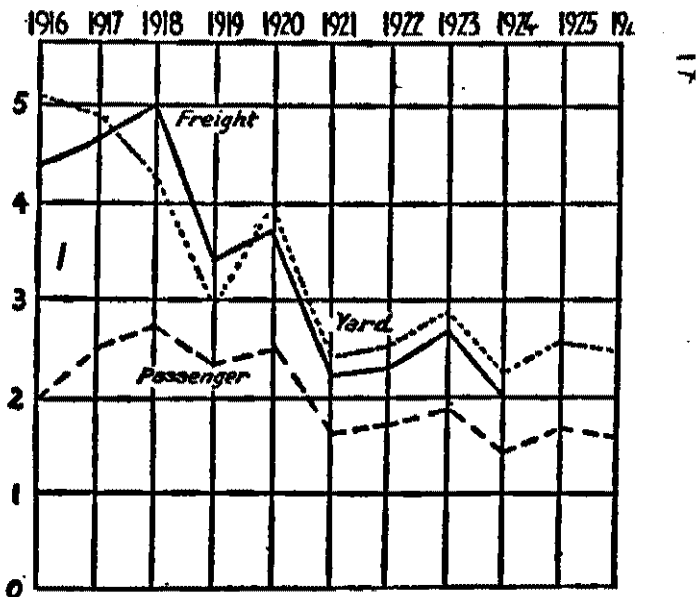


FIGURE 3. NUMBER OF TRAINMEN PER THOUSAND KILLED IN SERVICE OF STEAM RAILWAYS IN THE UNITED STATES, 1916-26
(I.C.A. Bulletin 95, p. 6.)

The automobile industry also has some good examples of accident prevention. In the Buick Motor Car Company, workers in the sheet metal division in 7 months lost a total of thirty fingers. Realizing that this record was a disgrace, the Company took drastic steps to insure future safety. Thereafter the plant functioned for as long as 15

months without a single amputation. The Ford Motor Company made even a better record. In 12 years it reduced the injury rate 80 per cent, notwithstanding that each year new hazards were created by the installment of more powerful and swifter machinery. During the fiscal year 1918-19, only one fatal accident occurred in the Highland Park plant among 50,000 employees; and from August, 1921, to October, 1922 (14½ months), not a single fatal accident occurred!⁵

Such records are not the result of luck, but rather of the scientific efforts of safety engineers, together with a liberal expenditure of money for removing the conditions which make accidents possible.⁶ They are obtained also by patient campaigns of safety education — an education that teaches individuals that accidents do not just 'happen' but are caused; and that the causes, for the most part, are preventable.

American Safety Movement

The American safety movement had its inception early in the twentieth century. The American Museum of Safety was founded in 1911, and has for its purpose the prevention of injuries and the elimination of industrial hazards, as well as those hazards that affect the general public. In the Museum which the association maintains in New York City are displayed safety devices of all descriptions. Two years after the organization of the Museum, the National Safety Council was established, and opened offices in Chicago. This organization now numbers several thousand members, including representatives of manufacturing concerns, railroads, mining in-

terests, technical schools, chambers of commerce, power companies, and so forth. It attempts to inform its members regarding safety methods, to assist in the standardization of safety devices, to promote new plans of safety activity; in short, to conserve human life in industry. Another organization which has as its main objective the simplification and standardization of accident prevention is the American Engineering Standards Committee. Its members include government bodies, manufacturing organizations, and insurance companies.

From the fact that the injury rate for the country has shown little, if any, decrease during the last several years, one might conclude that all of the safety organizations, safety campaigns, safety education, and safety propaganda have been of little value. Nothing could be further from the truth. It is probable that, had not this concerted effort been put forth, there would have been a marked increase in the injury rate because of the remarkable mechanization of industry during the past two decades.

The reasons why the safety movement has not progressed faster are many, not the least important of which is the failure to interest medium-sized and small concerns.⁷ As a matter of fact, the 'hit-skip' organizations and the factories which consider themselves too small to have accident problems, account for injuries wholly out of proportion to the number of workmen employed.

The unsatisfactory safety position of the smaller firm is seen in the fact that stock casualty insurance companies are becoming more and more reluctant to insure some of these establishments. The reason for this is made clear

by the experience in New York State in 1924 and 1925, where it was found that 94.2 per cent of the premiums received from small concerns were paid back in losses. Since the remaining 5.8 per cent of the premium received would not cover operating costs, the insuring agency suffered a loss.⁶

Our purpose here is not to engage in a detailed discussion of safety as an engineering problem, although there can be little safety without engineering assistance, but to determine why the engineers, the psychologists, the educators, and the government officials have been given so little opportunity, especially in smaller concerns, to show what can be done.

Fundamentals of Accident Prevention

The starting-point in the problem of accident prevention is the responsibility of the employer by virtue of the fact that he, and generally he alone, is responsible for the conduct of industry. Each day carries modern production one step farther away from the old handicraft method, wherein the workman was at the same time employee and employer, or if not the employer, so closely associated with him as to make their interests common. To-day, with great corporations, absentee control, hired managers, and machinery too expensive for any workman to buy, the situation is vastly different. Unless the employer assumes responsibility, it will not be assumed. To make sure that he does assume this responsibility is the initial step in injury prevention.

If the employer is held accountable for industrial accidents, he may pass part of the responsibility on to the

workers. No workman would long be retained who produced an inferior article, who wasted material, or who broke machines. Nor would it be profitable for a company to have a careless employee in its plant if such carelessness resulted in costly accidents. At least one company did not wait until carelessness had caused an accident. It had in its employ a crane operator whose record ostensibly had been very good. But one day this operator, without proper warning, carried a heavy load of steel with one chain instead of two, over the heads of a score of workmen. He was promptly released, and along with him the 'hook-up' man, whose negligence in not fastening the extra chain about the steel was hardly less serious than that of the craneman. This procedure cost two men their jobs and necessitated the breaking in of new men, but it saved the company money and other employees their lives.

Such a policy may appear somewhat harsh, but in companies where accidents are very frequent and serious, drastic methods must sometimes be resorted to in order to correct the situation. If an employee loses a job because he has broken safety rules, he will probably be more careful thereafter. If he is not, he will have difficulty in maintaining his family; but a man in jail also has difficulty in providing for his family. Every careless worker is a potential industrial murderer, and his problem is no less difficult to deal with than that of other murderers. Most workmen would be more careful if they knew their jobs depended upon care.

A study of accidents reveals that each kind of injury has its concomitant mode of prevention. For example,

the American Car and Foundry Company has demonstrated that the use of goggles lowers the injury rate. In this company's plants, eye injuries have thus been reduced 75 per cent. Another concern, the American Steel Foundries Company, collected in three months 94 pairs of goggles, all with lenses broken from flying chips of steel, and in every case the eyes had escaped injury. The accompanying table, showing the experience of the Amer-

TABLE 5. REDUCTION IN THE NUMBER OF EYE INJURIES IN THE AMERICAN LOCOMOTIVE COMPANY, 1910-15^a

YEARLY AVERAGE	NUMBER OF ACCIDENTS REQUIRING MEDICAL ATTENTION	NUMBER OF EYES LOST	AVERAGE NUMBER OF FULL TIME MEN PER YEAR EMPLOYED	NUMBER OF INJURIES PER 1000 FULL TIME MEN PER YEAR
1910-13.....	448	10.5	11,506	38.9
USE OF SAFETY GOGGLES ESTABLISHED				
1914.....	86	1	5,004	17.2
1915.....	52	2	3,311	15.7

^a National Committee for the Prevention of Blindness, *Eye Hazards in Industrial Occupations*, New York, Publication 12; p. 113.

ican Locomotive Company, proves that most eye injuries can be avoided if proper preventive measures are taken. Such precautions will be taken, once it becomes evident that it is cheaper to provide goggles and insist upon their being worn than to pay injury benefits. The States have been reluctant to report injuries by causes, thereby preventing the drafting of safety codes. If, for example, workers lose their balance and fall from a scaffold, it seems evident that the thing needed is some kind of railing about the scaffold. If injuries are caused by scaffolds swaying back and forth, some means must be devised to hold them fast to the building. In short, accidents must

be reported by causes, as is illustrated in the following table:⁹

OCCUPATION	AGE	CAUSE OF DEATH
Painter	40	While he was getting on scaffold it swung away
Bricklayer	56	Slipped and fell from scaffold
Laborer	62	Fell from scaffold
Carpenter	56	Slipped and fell from scaffold
Window caulker	27	Fell twelve stories from swinging scaffold

Many times the remedies for accidents are known but not used. Reference to the mining industry will make this clear. The United States Bureau of Mines has shown that many of the worst hazards of mining can be eliminated by the simple device of 'rock dusting.' Many organizations and individuals, especially the American Association for Labor Legislation, have called attention to this matter over and over again. Still the mines in a score of coal-producing States have failed to respond.

To meet all the requirements of the Pennsylvania Compensating Rating Bureau as regards the rock dusting of mines, the cost is three fifths of one cent on each ton of coal mined. One coal company has found that it costs \$12,284.17 to keep a large coal mine 'dusted' for a year.¹⁰ However, the accounting methods of this company were a little faulty in including in that sum the price of two 'dusting' machines, the life of which will be much longer than one year. The annual cost of safety in this mine is less than the cost of compensation for two industrial deaths and only a fraction of the cost of having a mine explosion. Furthermore, the presence of rock dusting systems in the Pennsylvania mines reduces the pre-

mium rate to such a point that the actual cost of dusting is only two fifths of a cent.²² That is to say, the coal mines of the United States could be freed from most of the dangers of dust or gas explosions, at an annual cost to each householder, if it were passed on in higher coal prices, equal to one city street car fare!²³

In five and a half years 59 'major' coal mine explosions caused the death of 1707 miners.²⁴

In 1926, 16 explosions killed 349 men

In 1925, 10 explosions killed 237 men

In 1924, 10 explosions killed 459 men

In 1923, 5 explosions killed 265 men

In 1922, 11 explosions killed 264 men

The following extracts from a newspaper article testify to the effectiveness of rock dusting in reducing mining hazards: ²⁴ 'Modern precautions against explosives saved the lives of 400 miners to-day.... The small number of fatalities was due to the fact that the entire mine had been insulated with rock dust.... A shot of dynamite... ignited coal dust and the resulting blast swept through two entires.'

Fortunately for the miners, the Associated Companies of Hartford, Connecticut, since October 1, 1926, have refused to insure any gaseous or dusty bituminous mines unless they are subjected to rock dusting. In commenting upon this action, a mining engineering authority said:²⁵ 'When an insurance company refuses you insurance because of high blood pressure, a bad heart, or for other reasons, you at once begin to consider your case seriously. When an insurance company refuses you compensation insurance because your mine is considered too great a

risk, you should consider your case seriously. A mine which has not been rock dusted is such a mine.'

The falling of roofs constitutes another menace in coal mines which seems in large measure preventable. The remedy, since it involves expenditures for labor and material (to provide more 'props'), is often not tried. Nominally, the problem of injury prevention is an engineering one; actually, it is an economic problem of costs. The cost of instituting safety measures may be little or much. Even though the expense bulks lightly in the company's cost accounts, the management may be deterred from investing funds in safety work in the belief that such investment, however small, may put its organization at a competitive disadvantage.¹⁶ As long as this belief is held, whether true or false, the progress of safety is being retarded. Whether one holds that competition is universal or highly restricted, the injury prevention bills go down in the expense columns of the ledger.

Coal is not the only industry in which the fear of competition hinders safety action. In a novelty manufacturing concern, it was found that girls were getting their fingers crushed in punch presses. The company made no effort to correct the condition, believing that the cost would be prohibitive. But upon being ordered to do something by the State factory inspection staff, the management obtained the services of safety engineers who, in a short time and at small cost, devised a double release which necessarily kept both hands out of danger. The officials of the company admitted that, had they known the cost would be so little, they would have provided safeguards before.

Such examples as have been given could be multiplied in nearly every field of industrial activity. The reason automatic couplers to prevent the loss of fingers, hands, and arms were not adopted sooner by railroads was not that they were not available, or their advantages unknown, but largely because their introduction would involve increased costs. Each railway wanted its competitor to take the lead in adopting this safety measure. Compulsion was finally necessary.

Collectively, the injury bill of industry runs into millions of dollars, but the cost to the individual business under present levels of compensation is relatively small. One firm doing \$85,000,000 worth of business a year found that its accident expense amounted to \$500,000 — less than 1 per cent of the operating receipts. The company was interested in the \$85,000,000; the 1 per cent was left to the safety man.⁴⁷ Had the safety engineer been given the title and influence of a vice-president, as was true with other department heads, accident prevention probably would have received the same careful attention given to buying, producing, selling, and advertising. When as much money is spent for safety as in advertising candy, cosmetics, and cigarettes, literally a whole army of workmen will enjoy the privilege of living a life relatively free from the danger of injury. But it is not necessary to spend as much as that.

The principal reason why more money is not spent for injury prevention is that the employer is not compelled to do it. If, in a given concern in a given period, there are lost three lives, six arms, two legs, and ten fingers, the cost to the employer, as he incorrectly sees it, is not in

excess of the amount of the benefits paid to injured persons, plus the operating costs of insurance. Bluntly, it may be cheaper to pay \$2000 for an arm than to prevent its loss. This does not mean that employers are hard-hearted and indifferent to the sufferings of their workmen; it simply means that in the daily grind of business the management attempts to reduce costs to a minimum. Just as a company would normally buy its raw material in the lowest market, or procure its laborers at the lowest wage, so, from a business standpoint alone, it would desire to keep its injury expense account at the lowest level possible.

The injury expense account is relatively small because injury benefits are small. Injury benefits are small because human beings are not rated at their true economic value. If industry had to pay the actual loss caused by industrial injuries, the safety problem would loom larger in the average company's affairs; the tactics employed in preventing injuries would correspond to the new importance of the enterprise. The program for safety would be changed with the same regularity and effectiveness which characterize the commercial advertisements blazoned on thousands of billboards. It would not only be a question of producing goods and selling them at a profit, but of producing goods with an injury record sufficiently low to make profits possible.

Workmen's Compensation Laws and Injury Prevention

At the time of their introduction, it was thought that workmen's compensation laws would effectively reduce the number of industrial injuries. Experience has shown

that these early hopes have not been realized. During the years immediately following the passage of the laws, some improvement in the safety situation was achieved. It is difficult to estimate how much of this advantage has been retained, but one thing is certain: The compensation system as it is now functioning is not able to keep the number of industrial injuries down to the desired minimum. The manner of production goes on in the old routine; compensation premiums are paid as a matter of course; the firm with the high injury rate fares little worse than its competitor with a slightly smaller casualty list; the preventive inducements of compensation as it is now administered, have run their course.

When the workmen's compensation acts were being written, the major problem was to decide how to collect money to pay injury benefits. It was decided to assess employers in the form of insurance premiums, because, first, it was a convenient way of doing it, and, second, it was thought that the employer would pass on the burden to the consuming public in higher prices for his articles, thus causing no particular hardship to any one. That this method of raising funds has been a convenient one has been amply demonstrated. That the employer always passes on the cost to the consumer has not been proved. Since a pooling of injury risks is desirable, it may matter little just which group — workmen, employers, or the public — assumes the burden. But from the viewpoint of the effectiveness of workmen's compensation laws in reducing the number of injuries, the ultimate incidence of insurance costs is important. If employers as a group can pass on the burden to consumers or workmen, and if

this burden is passed on in the same degree by all employers in a given line of production, it is probable that many producers, not feeling the pressure of competition in this respect, will do little toward reducing accidents.¹⁸

What, then, is the incidence of compulsory insurance of workmen? Obviously, here is a problem very similar in nature to that of the incidence of taxes, and like the latter, qualified by many complicating circumstances. It is extremely difficult to say to what extent any particular item enters into the cost of production. Different employers use different combinations of land, labor, and capital. Also, there is a variety of costs to be considered - transportation charges, wages, rents, material costs, taxes, advertising, and so forth. Any producer's actions will be governed somewhat by whether he is in a competitive industry or whether he enjoys quasi-monopoly conditions; whether his costs are of the increasing or decreasing variety; whether he is a low cost or a high cost producer.

It has been argued that, if all industries are affected alike, prices would not change because supply and demand conditions remain the same.¹⁹ This being the case, employers, in the first instance, would have to bear the cost, but would attempt to pass it on to some other group. Since compensation premiums are levied upon the amount of payroll, and not upon product, the ultimate incidence of the premiums would be upon workmen. Employers as a group would bid less for their services. Wages plus premiums would tend to equal wages in the absence of any compensation provisions.

Whether or not one agrees with this reasoning, it seems

fairly certain that when insurance premiums fall more heavily upon one company than upon another, because of a greater degree of hazard in the one than in the other, there may result, under competitive conditions, a change in relative prices. If this change actually takes place, the company with a high injury rate is at a competitive disadvantage. It cannot hope to persuade the consuming public, solely because of higher injury costs, to pay more for its goods than for those of its competitor. One of two things may result — either profits will decrease, or greater efforts will be made to prevent accidents.

The company with the high injury rate may not be obliged to change its safety activities whatever. It may not be the 'marginal' firm when total costs are considered. The high injury rate may be due to 'speeding-up,' which results in large profits. In this event, premium rates would have to be made high enough to offset gains accruing elsewhere. Just how high, would depend not only upon the relative profits of competing companies, but upon the general level of profits. During periods of great industrial activity, the number of accidents increases, and profits grow larger.

Merit Premium Rating

When an employer carries his own insurance risk, he has a direct incentive to reduce the number of injuries in his establishment. His gains therefrom may be no greater than if he were insured with a private insurance company or a State fund; but they are more apparent. Many companies, after deciding to carry their own risks, hire expert safety engineers and really begin to practice safety.

If an employer carries his insurance with a private company or with a State fund, his incentive to engage in safety work is conditioned by the nature of the system which determines his premiums. That is, premiums are determined upon a 'merit' basis, so as to offer a financial incentive to injury prevention. The two prevailing methods of effecting merit rating are, first, schedule rating and, second, experience rating.

Schedule rating starts out with a certain basic rate, as \$1 per each \$100 of payroll. This basic rate is then moved downward or upward, depending upon whether the employer accumulates 'credits' in excess of 'debits,' or 'debits' in excess of 'credits.' The 'debits' result from failure to comply with the physical standards required, and mean an addition to the premium. Thus, an unguarded belt, a stairway without a railing, or an exposed gear would each add a certain additional amount to the basic rate. If the employer not only safeguards those things required by law, but takes positive steps to reduce injuries, he can accumulate 'credits.' These credits are deductions from the initial premium. Thus, the installing of a safety organization and inspection department might give an employer a credit of 5 per cent; a hospital with a company physician and trained nurses might add another 3 per cent; keeping aisles clear of material might add 1 per cent; and so on.

Experience rating is based upon past performance, rather than upon expected future performance. The basic rate is the minimum rate. The basic rate of \$1 per \$100 of payroll will include, let us say, 40 cents as a basic compensation allowance, 20 cents for medical and funeral

costs, and so on, until \$1 is reached. Injuries are divided into groups so that their occurrence may be reflected in the final premium rate. A limit is generally placed upon the premium rate so that it may not exceed a designated amount. When sufficient premiums have accumulated to determine the injury experience of any particular employer, his future premiums will be 'corrected' so that they will harmonize with actual injury record. Deaths and total disabilities have the greatest effect in moving the rate upward.

Most States have adopted one or the other of these systems, and a few have tried to combine them. Experience rating fails in some instances to secure the best coöperation of the employer because it does not show him in advance just where and how he can accumulate 'credits' and avoid 'debits.' Schedule rating also has its defects. A factory may have machine guards, warning signs, safety committees, and other safety devices, and still have a high accident rate. Perhaps wages are low, and the labor turnover high; perhaps hours are long, and fatigue very great among the workers; perhaps other things are present which will be difficult to measure in a schedule. After all, the end is not a safety-first campaign, but fewer workmen killed and injured. The establishment which must be watched is that one which injures and kills, regardless of the extent to which it has devoted itself to preventive work.

Any system of premium rating will fail to prevent accidents as long as injury benefits are too low. A study of workmen's compensation in thirty States showed that benefits paid during a two-year period amounted to less

than 1 per cent of the payroll. It is not reasonable to believe that a slight premium adjustment based upon 1, or even 5 per cent of wage cost could have any appreciable effect upon the total cost of production, and hence upon accident prevention.

Although much can be accomplished by a proper method of premium rating, there is need for a still further change of view regarding the responsibility for injuries. It will be recalled that under the employers' liability system the employer could be relieved of paying damages if he could prove that a worker had been careless, or a fellow worker had been negligent, or any one of some half dozen 'defenses.' There was little in such a system to aid injury prevention, because the major responsibility was placed upon the worker, rather than upon the employer. The latter alone has control of production; the former merely takes orders. The general idea of the liability of the employer was correct. The difficulty experienced in the application of the principle was due to the exceptions which made the employee, rather than the employer, liable for the consequences of industrial injuries. Employers' liability, under the influence of common law doctrine, was interpreted to mean exemptibility, rather than responsibility.

Workmen's compensation laws, by subordinating fault to the payment of benefits, diverted attention from the question of responsibility for the causes of injuries to the compensation of injuries after they had occurred. In order not to lose sight of fault, various methods have been suggested for fixing employer responsibility. In Ohio, for example, if it can be shown that an employer has violated

safety regulations, resulting in injury, the employee is eligible to additional benefits of from 10 to 50 per cent of the regular benefits. During the first three years of the operation of the Ohio penalty, \$83,736 was paid directly by employers to injured workmen or their dependents. If this penalty system has any merit, it is difficult to find it in Ohio's injury record. This is not an argument against the penalty as such. Since the penalty is a certain per cent of benefits, it depends upon the size of the benefits. If a penalizing plan could be based upon an adequate system of benefits, the term 'employers' liability' would take on a new meaning — the meaning which one would naturally draw from these two words had he never heard anything about the long, sad history of injured persons prior to compensation.

Conclusion

Our thinking on injury prevention has been colored by machine guards, safety bells, and stop signs. These are only the visible tools by means of which the work is performed. The real motive power is the willingness to provide the tools. The engineering and educational ability is not lacking. It can effectively reduce the human hazards of industry if only given a chance. This opportunity, in some cases, has come at the employer's request; in others, compulsion seems necessary. This compulsion can be exercised by the State by virtue of the fact that it determines compensation policies. If the government would move industry to practice safety, it must speak the language of industry. It must make its appeal felt from a business standpoint. That is, it must make the issue a

financial one, expressed through the medium of costs. In short, safety must be made the counterpart of savings, and industrial casualties the cause of business losses. It is in these savings, or losses — this differential between any one firm and its competitors — that the possibility of additional injury reduction lies.

CHAPTER XIII

OUTLINES OF A PERMANENT PARTIAL DISABILITY SCHEDULE

IN this chapter no effort will be made to construct a complete disability schedule. If such were attempted with the limited information at hand, the ratings would have to be based upon guesses, and we have already seen the evil effects of this method. The procedure used in developing an ideal schedule will be described. Some of the points raised are only suggestions, and must be treated as such. Only through the coöperation of all the States in combining their experience will it be possible to construct a detailed schedule covering every possible type of injury.

A 'Standard' Injury was Selected

The starting point of a permanent disability schedule is the establishment of relationships between different types of injuries, irrespective of the age or occupation of the injured person. To do this, it is necessary to take one injury as a base and relate all other injuries to it. Any injury might be used for this purpose, but since the loss of an arm at the shoulder was adopted by both California and the Committee of the I.A.I.A.B.C., that injury will be taken as the standard for the purposes of the present analysis.* Only principal or key injuries will be considered, and of these, a rating will be assigned to only those about which information is available. The ratings are based on loss of earning capacity, and in the present

case that base will equal the loss which was found to result from injuries in the Ohio studies as already described. The following table shows the percentages for loss of members in terms of the loss of an arm:

TABLE 6. PERCENTAGES FOR LOSS OF MEMBERS IN TERMS OF LOSS OF ARM, WHICH IS 100 PER CENT ^a

TYPE OF INJURY	PER CENT
Arm at shoulder.....	100
Arm at or above elbow.....	85
Hand at or above wrist.....	75
Thumb.....	10
Leg at hip.....	115
Leg at or above knee.....	90
Foot at or above ankle.....	80
Eye.....	40

^a For Class B workers.

Dexterity Factor

Since it was shown in Chapter III that the loss of the left hand, arm, fingers, or thumb is usually less serious than the loss of similar right members, a reduction of $2\frac{1}{2}$ per cent (absolute) is made in disability rating for left members.² Conversely, if the injury is to a right member, the rating is increased by $2\frac{1}{2}$ per cent (absolute).²

Skill Factor

Since the skilled worker, because of his greater powers of adaptability, suffers less loss of earning capacity than does an unskilled worker, compensation benefits should be adjusted accordingly. To divide workers into different groups depending upon their relative knowledge, skill, adaptability, and other qualities is exceedingly difficult; but though difficult, it should be attempted. The differ-

ence in loss of earning power between these groups is too great to be ignored.

In considering the occupation factor, it seems that a small, rather than a large, number of groupings is desirable. A detailed plan of grouping presupposes differences which do not exist, at least not in sufficient degree to make them important. Furthermore, it is almost impossible to determine in just which group each injured person should be placed. There is little difficulty in distinguishing unskilled from skilled occupations, but to determine whether a certain occupation is unskilled, semi-skilled, or skilled is somewhat difficult. The same difficulty appears here as in all attempted classifications, and although there will not be unanimity of opinion, some classification seems desirable. Following the plan used in Chapter IX, the classification suggested will be comprised of only three groups. Perhaps four, five, or even six groups would be better, and future study may show the wisdom of a larger number of groupings.⁴ These three groups will be designated as Class A workers, Class B workers, and Class C workers. Class A will include those employees usually designated as skilled; Class B, semi-skilled; Class C, unskilled. To show the type of workers included in each of these three classes, as well as to make clear the difficulties of placing them where they properly belong, the following brief table is given:

CLASS A	CLASS B	CLASS C
Architects	Automobile assemblers	Coal loaders
Automobile mechanics	Cranemen	Coal shovelers
Bookkeepers	Printing press operators	Coal miners
Cabinet makers	Street car conductors	Construction luggers

CLASS A	CLASS B	CLASS C
Carpenters	Tire builders	Ditch diggers
Linotype operators	Truck drivers	Dock workers
Machinists	Lathe operators	Janitors
Pattern makers	Punch press operators	Lumberjacks
Teachers	Street car motormen	Street repair workers
Construction engineers	Foremen (2d class)	Section hands
Clerks (1st class)	Railway brakemen	Teamsters

Even concerning the small number of cases listed above, there probably would be considerable difference of opinion as to where each occupation should be placed. For example, what of a foreman? Should he not be classed among the skilled and more intelligent workers? That depends upon what kind of foreman he is. If he became a foreman by promotion from a skilled occupation, or if his duties are such as to demand considerable knowledge and skill, he should be placed in Class A. If he happens to be a yard foreman of the 'straw boss' variety, he should be in Class C. Likewise, it is very possible that some automobile assemblers are more skilled than automobile mechanics. Here, again, it depends upon what kind of mechanic or assembler a worker happens to be. The same rule applies to clerks, some of whom should be in Class A, while others should be in Class B. In order to place such doubtful cases, their occupations might be subdivided into classes according to the particular nature of their work. If, after having made a detailed study of occupations, and having assigned each type of worker to what then was thought to be his proper 'class,' subsequent experience should show that an occupation had been improperly placed, a change could be made.

The above procedure would be similar to what the

rehabilitation bureaus are doing daily. It is an attempt to gauge an injured worker's future possibilities on the basis of his past experience; to classify persons on the basis of their probable economic status after they have had a chance to adjust themselves to the new conditions caused by the injury. This work would require competent administrative officials who thoroughly understood the problem with which they were dealing. The making of important decisions, however, is one of the daily tasks of compensation and rehabilitation officials. They must continually decide the extent of an injury, the wisdom of granting lump sum payments, the eligibility of a claimant to compensation, the planning of a retraining program, and many other issues which are fully as difficult to determine as would be the placing of injured employees in the proper occupational class. The occupation rating would be an addition to, not a departure from, ordinary duties.

The suggestion of dividing workers into different classes on the basis of their adaptability is in harmony with the present-day application of principles of psychology to the problems of education and of industry. Educators, for the most part, recognize that it is possible to divide students into different groups on the basis of their intelligence quotients. During the late War, the United States Army used tests to determine the relative capacities of the soldiers for different tasks. Labor departments in many companies determine the qualifications of each applicant, and place him accordingly. Those who do not believe in the efficacy of psychological tests should note that the foregoing suggestions do not

imply a segregation of those persons with a 100 'I.Q.' from those with an I.Q. of 101, and so on, but rather only a threefold division which would place the person with an I.Q. of 100 in a different class from those with I.Q.'s of 70 and 150.

Having made a classification, it is necessary to assign values to each class. Since Class A (skilled) workmen, on the average, sustain a smaller loss of earning capacity as a result of accidents than Class B (semi-skilled) workmen, they should be given a lower disability rating. Since Class C (unskilled) workers sustain a greater loss of earning capacity than Class B workers, they should be given a higher disability rating. The absolute difference in the loss of earning capacity between Class A and Class C workers is, on the average, about 30 per cent, but the absolute percentage difference between Class C and Class B workers is 18, while that between Class A and Class B workers is only 12. This difference between the two groups may be an indication that more classes are necessary, or that the workers are not properly divided.⁵ If only three classes are used, the divisions of the occupations among the classes probably should be such that Class B workers stand about midway between the other two classes; otherwise it would be necessary to credit Class C workers by an amount in excess of that to which Class A workers are penalized.

If Class B workers stand midway between Class A and Class C workers, to equalize their respective losses in earning capacity it would be necessary to credit Class C workers and to penalize Class A workers by an equal amount. To do this, Class B workers will be considered

as a base. Class C workers will then be given a disability rating 15 per cent (absolute) higher than that accorded to Class B, while Class A workers will be given a rating 15 per cent (absolute) lower than that given to Class B workers. For fear that certain exceptional cases may arise in which the nature of the injury and the occupation are such that an undue loss of earning capacity results, the agency responsible for making the rating could be given the authority to increase the award by an amount not to exceed 15 per cent (absolute). This increase would be sufficient to put a workman into a new and higher class. Any larger amount would only make more difficult the rating, in view of the use of occupational classes.

Age Factor

There is still the age factor to be considered. It already has been made clear that the older a worker becomes, the more difficult it is for him to adapt himself to post-injury conditions. He is too old to learn a new trade and the rehabilitation bureau has difficulty in restoring his earning capacity unless it can induce an employer to give him such work as his disabled and aged condition will permit him to do. Industry is not very friendly to the old man under any circumstances, and this attitude appears especially strong in the case of a man suffering an impairment. The difference in the loss of earning capacity due to injury sustained by old workers, as compared with young workers, is even greater than the difference between the losses of the unskilled, as compared with the skilled workers. In other words, age has a greater influence upon the adaptability of an injured man than

does the factor of occupation, although the latter is exceedingly important.⁶

According to data presented in Chapter IX, the loss of a major arm at the shoulder to a worker 20 years of age, pursuing a Class B occupation,⁷ results in a reduction of earning capacity of a little over 30 per cent. (See Figure 4.) At 25 years of age the loss is about 33 per cent. Dur-

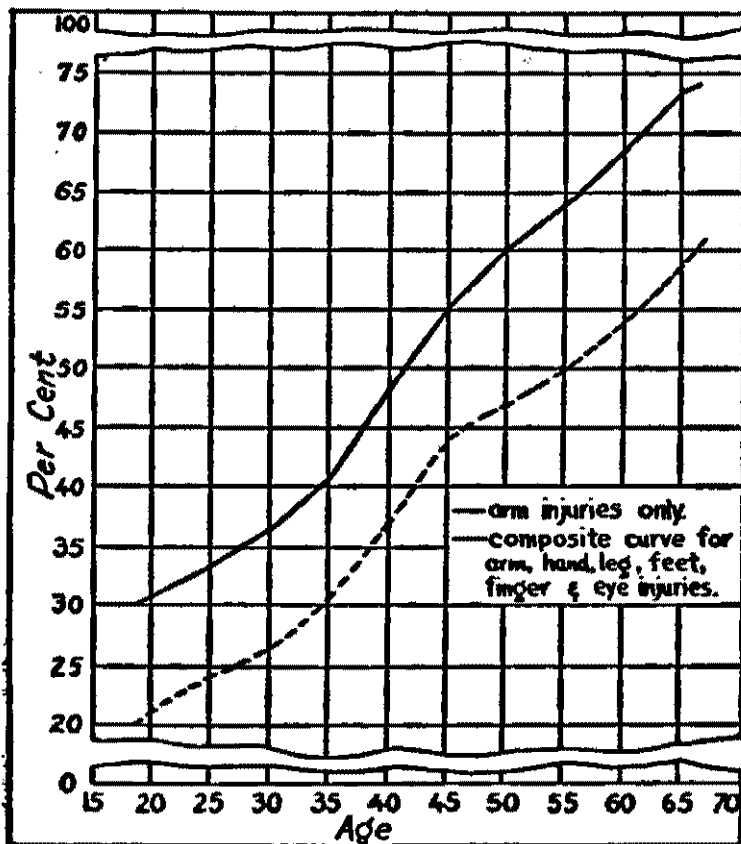


FIGURE 4. PER CENT LOSS OF EARNING CAPACITY SUSTAINED BY INJURED PERSONS OF SPECIFIED AGES

ing the ten-year period from age 25 to 35, there occurs an 8 per cent (absolute) decrease in earning capacity; from 35 to 45, a 15 per cent (absolute) decrease, the largest amount in any decade of a worker's life. From age 45 to 55 the increase is 8 per cent (absolute); from age 55 to 65, 9 per cent (absolute). The age line is terminated at 65 years because a worker at that age who sustains the loss of a major arm cannot regain earning capacity. The proper thing to do is to pay him total disability compensation. The cost would be relatively small, because his life expectancy is only 11 years.

By use of the age line, the per cent of disability caused by the loss of the major arm of a Class B worker can be found for any age. Thus, at age intervals of five years they are:

AGE	PER CENT	AGE	PER CENT
20	30	45	56
25	33	50	60
30	37	55	64
35	41	60	68
40	48	65	73

A Composite Disability Schedule can be Used

To facilitate the work of compensation officials, a single table can be constructed which will show the per cent of disability to be attributed to any injury causing loss of member or members, received by a workman of any age in any one of the three classes of occupations. The starting point for such a table is an index of relativity (Table 6) for injuries to Class B workers. The age factor is then applied to the arm injury and other injuries related to the arm. The loss of earning capacity (per cent

of total disability) for Class A workers is obtained by subtracting 15 per cent (absolute) from the Class B ratings; for Class C workers, by adding 15 per cent (absolute).

TABLE 7. DISABILITY RATINGS FOR SELECTED INJURIES AT SPECIFIED AGES IN DESIGNATED OCCUPATIONAL GROUPS, STATED AS A PER CENT OF TOTAL DISABILITY

LOSS OF	INDEX OF RELATIVITY ^a	PER CENT OF TOTAL DISABILITY AT SPECIFIED AGES									
		20 and under	25	30	35	40	45	50	55	60	65 and up
CLASS A:											
Arm at shoulder.....	100	15.	18.	22.	26.	33.	41.	45.	49.	53.	68.
Arm at or above elbow.....	85	13.8	15.3	18.7	22.1	28.0	34.9	38.2	41.7	45.0	57.8
Hand at or above wrist.....	75	11.3	13.5	16.5	19.5	24.8	30.8	33.8	36.8	39.8	51.0
Thumb.....	10	1.5	1.8	2.2	2.6	3.3	4.1	4.5	4.9	5.3	6.8
Leg at hip.....	115	17.2	20.7	25.3	29.9	38.0	47.1	51.8	56.4	61.0	78.2
Leg at or above knee.....	90	13.5	16.2	20.8	25.4	32.7	40.5	44.1	47.7	51.3	64.2
Foot at or above ankle.....	80	12.0	14.4	17.6	20.8	26.4	32.8	36.0	39.2	42.4	54.4
Eye.....	40	6.0	7.2	8.8	10.4	13.2	16.4	18.0	19.6	21.2	27.2
CLASS B:											
Arm at shoulder.....	100	30.	33.	37.	41.	48.	56.	60.	64.	68.	73.
Arm at or above elbow.....	85	25.5	28.1	31.5	36.9	40.8	47.6	51.0	54.4	57.8	62.0
Hand at or above wrist.....	75	22.5	24.8	27.7	30.8	36.0	42.0	45.0	48.0	51.0	54.8
Thumb.....	10	3.0	3.3	3.7	4.1	4.8	5.6	6.0	6.4	6.8	7.3
Leg at hip.....	115	34.5	38.0	42.6	47.2	55.2	64.4	73.6	73.6	78.2	84.0
Leg at or above knee.....	90	27.0	29.7	33.3	36.9	43.2	50.4	57.6	57.6	61.2	65.7
Foot at or above ankle.....	80	24.0	26.4	29.6	32.8	38.4	44.8	48.0	51.2	54.4	58.4
Eye.....	40	12.0	13.2	14.8	16.4	19.2	22.4	25.6	25.6	27.2	29.2
CLASS C:											
Arm at shoulder.....	100	45.	48.	52.	56.	63.	71.	75.	79.	83.	88.
Arm at or above elbow.....	85	34.9	40.8	44.9	47.6	53.6	60.4	63.8	67.2	70.6	74.8
Hand at or above wrist.....	75	30.8	36.0	39.0	42.0	47.3	53.3	56.3	59.3	62.3	66.0
Thumb.....	10	4.5	4.8	5.2	5.6	6.3	7.1	7.5	7.9	8.2	8.8
Leg at hip.....	115	47.1	55.2	59.8	64.4	72.5	81.7	80.3	84.7	84.7	88.2
Leg at or above knee.....	90	40.5	43.2	46.8	50.4	56.7	63.9	67.5	71.1	74.7	79.2
Foot at or above ankle.....	80	32.8	35.4	41.6	44.8	50.4	56.8	60.0	63.2	66.4	71.2
Eye.....	40	16.4	19.2	20.8	23.4	25.2	28.4	31.0	33.6	36.2	41.6

^a Based upon Table 6.

^b Above 90 per cent disability.

There are two items in the above table at which one may look askance. First, no ratings are listed for the loss of a leg at the hip for those persons who have reached 55 years or more. The ratings, had they been given, would have been in excess of 90 per cent. Their omission is based upon the assumption that whoever loses as much

of his earning capacity as 90 per cent is, for all practical purposes, totally disabled.

The second questionable item is the relatively small rating given to Class A workers under 40 years of age. For example, should a boy under 20 years of age receive only a 15 per cent rating for the loss of an arm? On a loss of earning capacity basis, this seemingly low rating is in harmony with other ratings in the table. In this case, everything points to a satisfactory rehabilitation. The injured worker is both young and adaptable. It is true that many workers under 25 years of age have not found a task to their liking, and that their adaptability is not susceptible of measurement. It was to meet just such a situation that the suggestion was made above that the compensation boards should be empowered to make a change of 15 per cent (absolute) in an award if special conditions warrant it. The fact that a young worker receives relatively low wages on which the award would be based may seem to detract further from his just award. This is not the case, however, because a wage index may be employed which will adjust a young worker's present low wages to expected future wages.

Wage Index

The Committee of the I.A.I.A.B.C. suggested this type of a wage index.

AGE	WAGE INDEX	AGE	WAGE INDEX
20.....	133	45.....	79
25.....	109	50.....	78
30.....	97	55.....	80
35.....	89	60.....	81
40.....	81	65.....	83

The principle of this index is easily understood. The index at age 20 is 133. This means that the reported wage of an injured worker of this age will be increased 33 per cent, and the new wage thus obtained will be used as the basis on which to compute the weekly benefits. The amount of the weekly benefits is obtained by applying the disability ratings to the weekly wage after such wage has been 'corrected' by the wage index.

Compensation for Minor Injuries

It will be noticed that only representative major injuries are included in Table 7. What of such minor injuries as the loss of a little finger at the first joint, or the loss of a toe at the second joint? Are they to be compensated on the basis of the age and type of occupation of the injured person, and will benefits for such injuries be paid in 'pin money' over a period of years? Practical expediency demands a less complex method for dealing with such minor injuries. Therefore, in constructing a disability schedule, it is suggested that a plan similar to that now being used in Wisconsin be employed, to wit: The permanent partial disability schedule shall be divided into two general parts, one to be known as the 'major' schedule and the other as the 'lesser' schedule. Benefits for those injuries listed in the 'lesser' schedule shall be stated in terms of the number of weeks during which compensation shall be paid.

To determine just where to draw the line between 'major' injuries and 'lesser' injuries is not easy. In the 'lesser' disability schedule, Wisconsin places such injuries as the following:

1. The loss of a thumb at the second or distal joint, 30 weeks.
2. The loss of an index finger and the metacarpal bone thereof, 50 weeks.
3. The loss of an index finger at the proximal joint, 35 weeks.
4. The loss of an index finger at the second joint, 20 weeks.
5. The loss of a ring finger at the second joint, 9 weeks.
6. The loss of a little finger at the distal joint, 6 weeks.

The total amount of the award for any one of these injuries is obtained by multiplying the designated number of weeks by that sum of money which represents 65 per cent ⁸ of the average weekly earnings of the worker at the time of injury. A correction for age can then be made.

Still another class of injuries needs consideration. It includes those partial disabilities (either temporary or permanent) which are not included in the disability schedules. The flat-rate disability schedules now in use do not attempt to show how large an award shall be given to the worker who injures his back, for example, or strains a ligament in his arm, or a tendon in his leg. At the present time, most State laws provide that if a person who has been earning \$20 per week, for example, is obliged, because of an injury, to accept \$15 for a weekly wage, he shall receive as compensation a certain per cent ($66\frac{2}{3}$ being the most common) of the difference between the two wages ($66\frac{2}{3}$ of \$5), subject to a maximum weekly benefit, and in some States, a maximum period of payments. Here is one case in which loss of earning capacity is used as the basis of an award. In the outlines

of the schedule under consideration, such injuries would be treated as at present, except that the maximum limitations would be removed, and disability benefits would be paid as long as the disability continued to detract from earning capacity.

Conclusion

The foregoing represents a plan for a permanent partial disability schedule based upon such facts as were discussed in preceding chapters. The suggestions have been made with due consideration to those systems now in existence which scientifically attempt to rate disabilities for compensation purposes. In recognizing the occupational factor by dividing workmen into three general groups, it is believed that the schedule will not be too complicated, and will, therefore, avoid the criticism constantly being directed against the California system. Some of the principles incorporated in the British Columbia system have been followed, with the notable exception that the type of occupation, rather than the amount of weekly earnings, is used (along with age) in determining the degree of probable future disability. A few suggestions were obtained from the experiences of other countries. Finally, the *Report* of the Committee of the I.A.I.A.B.C. furnished both suggestions and data.

The outlines of the schedule consist of a selected list of permanent partial disabilities and the percentages of total disability which they are thought to represent. To the extent that the data used are correct, a disability schedule of this sort should indicate how large an award, both absolutely and relatively, should be given for any one injury.

CHAPTER XIV

WORKMEN'S COMPENSATION OR LIMITED INSURANCE?

No one who is familiar with the history of labor legislation in the United States believes that any profound changes in our workmen's compensation laws are imminent. Certainly no such revision as suggested in the preceding chapters is likely to take place in the near future. However, changes will probably come in time. Year by year, through the gradual process of amending the laws, additions and alterations will be made which will constantly better the system.

Many things will combine to bring about these changes, but three seem to be outstanding. First, the development of the rehabilitation movement each year will demand a reappraisal of the compensation laws. Second, the growing menace of industrial injuries will force changes in accident prevention. It will be only a matter of time before the States will become so dissatisfied with the inexcusable size of their annual industrial casualties that the systems which allow such occurrences will perforce undergo a change. Third, the growing popularity of life, accident, and liability insurance will direct attention to the economic value of human beings.

There is danger in change. It lies not in the possibilities that changes will be too rapid or drastic, but in the probability that the little changes, year by year, may obscure the real weaknesses of the compensation laws, and

thereby prevent their correction. To raise the maximum award from \$12 to \$15 a week and then to \$18 is very much worth while; to shorten the waiting period and to make the scope of the laws more inclusive are likewise changes very much to be desired. So with other minor improvements. All of them are to be welcomed, but all of them together cannot make a good compensation, rehabilitation, and accident prevention system if the underlying philosophy is faulty. After all, the important question is: What is all of this industrial injury legislation attempting to accomplish; or, rather, what should it attempt to accomplish? Unfortunately, this question cannot always be clearly viewed because of the walls of self-interest on one side, and legislative compromise and political chicanery on the other.

The fundamental purpose of such legislation should be the guaranteeing of the production of goods and services with the minimum loss of life and limb to the workers, with the least possible economic hardship to the injured persons and their dependents, and finally, with the lowest cost to society consistent with these requirements. When every effort has been made to prevent injuries, society's debt to the worker crippled in spite of all these efforts, or to his dependents if death results, can be paid only through adequate compensation benefits. That is, compensation in the real sense of the term should be paid so that incapacitated men and women will not be at an economic disadvantage with their fellow men.

The compensation problem would be greatly simplified if it were only a question of providing an injured person with an award. But there is the adequacy of the award

to be considered. Nor does the matter end there. The award must not only be adequate, but it must be of such an amount, and given in such a way, as to fit properly into the scheme of accident prevention on the one side, and into the plan of rehabilitation on the other. It is in these relationships that the most important and most difficult problems arise. Premiums collected from employers must be sufficiently large to make injury costs bulk so heavily in the company's accounts that careful attention will be given to accident prevention. Not only should premiums be large enough to provide adequate benefits for injured persons, but they should automatically divide the most hazardous firms from the less hazardous ones, and force the former to reduce accident rates through the pressure of competitive costs. But here wisdom is necessary. Large benefits should be made possible, but it must not be forgotten that there is danger in giving to some crippled persons benefits that are too large, thus destroying the possibility of a successful rehabilitation.²

All of these considerations ultimately turn to the basic question as to whether what is desired is workmen's compensation or limited injury insurance. If the system is to be a compensation system, it will be necessary, first, to know the real losses involved in industrial injuries, and, second, to pay benefits in accordance with these losses. If the existing, so-called workmen's compensation laws are to continue merely as limited insurance bills, it remains for their sponsors to justify their existence as over against compensation measures. To do this, it will be necessary to prove either that society, through the

medium of its industries, cannot pay to injured workmen sums commensurate with their losses, or that society is not justified in doing so even if it can.

The theme of this book suggests that society is not only justified in paying the full injury bill, but, on economic grounds alone, is duty bound to do so if it can.

Can Industry Pay?

Can industry pay its annual injury bill in full? That, obviously, depends upon the size of the injury bill. The size of the injury bill depends upon the number of injuries, and upon the financial loss attending each injury. Present injury statistics are not a proper basis of computation, because such a basis assumes that higher benefits would have no effect upon the total number of injuries — certainly an unwarranted assumption if compensation laws are reorganized so as to place accident prevention on a strictly business basis. As long as no more than \$2000 is paid for the loss of a leg or an arm, the amount spent for prevention will be correspondingly small. But make the cost of such an injury to the employer four, five, or eight thousand dollars, and the business of preventing injuries will take on new importance. Nor will a strenuous campaign for safety bankrupt the employer.² The experience of every industry in which any marked degree of safety has been obtained, points to the contrary. With safe working conditions come efficiency and larger production; costs are reduced; labor relations are bettered as management and workers are brought nearer together. Employers with low injury rates are almost unanimous in their agreement that it

pays to prevent injuries, even at the present rates of compensation. How much more would it pay, should those rates be doubled or trebled!

It should be remembered, also, that at the present time financial losses imputed to non-fatal injuries do not take into consideration all of the future possibilities of rehabilitation. If we assume that better methods of re-training reduce losses in earning capacity, it is probable that even though benefits were made approximately equal to loss of earning power, the total amount needed to pay compensation in any given injury case in which proper training had been provided might be less than is required at present. If the assumption is correct that the number of injuries would be lessened if higher rates were adopted, it is probable that there would not be any appreciable increase in the total cost of workmen's compensation under the new system.

'A really adequate scale of compensation benefits, such as has never yet been established in the United States or elsewhere, would add something like ten cents to a sixty dollar suit of clothes, thirty-five cents to the cost of a fourteen dollar ton of anthracite coal, and two hundred dollars to the cost of a ten thousand dollar home.'³

Human Values are Underestimated

The greatest obstacle to the payment of adequate benefits lies in the underestimation of human values.⁴ When a man is killed or injured, a financial consideration is paid which is usually so small that it bears no relation to the economic loss. Had the injured worker been a slave and the employer a slave master, the master would

try to collect damages, based upon the purchase price (or present value) of the slave, from the person responsible for his death or injury. But not so in modern industry. The employer does not buy a workman; he simply hires him. That is to say, he buys his current labor. The future expected labor means little to the individual employer, because in most cases he has little trouble in hiring a new worker if he loses the old one. But there is a loss, nevertheless. The problem is to measure it and to apportion the cost.

Example of Wisconsin

The final solution of the problem demands a revamping of the State workmen's compensation laws. This cannot be done in a single year. If changes are to be made, they must come gradually. Occasionally a State legislature takes a step in the right direction. Wisconsin, for example, by gradually amending its workmen's compensation law, is paying injury benefits in a more scientific manner than is true in some of the other States. In at least four ways, Wisconsin has pointed the road to improvement:

- (1) It attempts to rate permanent partial disabilities in terms of total disability.
- (2) It varies the award with the age of the injured person.
- (3) It increases compensation (15 per cent) when the injury is caused by the failure of the employer to comply with the safety code of the State.
- (4) It provides maintenance funds (maximum \$10 per week for 20 weeks) for injured employees who agree to take retraining with the rehabilitation bureau.

Some other States have adopted these or similar provisions. It is in the method of making changes gradually in view of obstacles, rather than in the content of the changes as such, that the Wisconsin law offers suggestions which may be followed by other States.

The basic principle of the Wisconsin plan of disability rating ultimately will result in determining compensation benefits on a loss of earning capacity basis.

If partial disabilities are to be rated as a certain per cent of total disability, there is likely to appear a demand to know how much disability is actually caused by the loss of any member. In short, there will be an insistence upon studies to ascertain just what is the loss of earning power caused by any particular injury, for to rate injuries in terms of total disability is merely to attempt to arrive at the actual loss of earnings caused by a particular injury.

When any State reaches the conclusion that it will rate any particular disability as a certain per cent of total disability, there are two possible methods whereby its purpose may be accomplished. First, the officials responsible for the administration of the law may 'guess' the per cent of disability caused by a given injury. Second, the factors which determine the degree of disability, such as the type of injury, age, and occupation of the injured person, and so on, may be observed and analyzed and then made the basis of computation.

Thus far Wisconsin has succeeded in carrying out the mandate of its law to the extent that age is used as one of the component factors in computing the degree of disability. The section relating thereto reads as follows:

'For each yearly age group under 30 years the percentage shall be reduced by two thirds of one per cent with no reduction below 40 per cent for the child 15 years or under. For each later yearly age group beginning with 31 the percentage shall be increased by seven eighths of one per cent with no increase beyond 85 per cent for age 70 group.'

Very little difficulty is experienced in determining the award for any particular injury, since a table is available showing the per cent of total disability to be attributed to any particular injury, corrected for age. The maximum limitations in the Wisconsin law will bear some criticism, but the significant fact is that Wisconsin has actually abandoned the flat-rate idea with which it began, to the extent of recognizing the age factor. It does not seem as if it would be impossible, or even extremely difficult, to change the Wisconsin law still further so as to recognize the occupational factor, or rather the mentality and adaptability factors as indicated by occupation.

More Data Needed

Neither Wisconsin nor any other State can make these changes without a factual basis. A recent publication of the Institute of Economics aptly sums up the situation by saying:⁶

'At every point of the program statistics are indispensable. Statistical data are required in the first place to awaken interest in these problems and to stimulate prevention.... Prevention and control wait upon knowledge of the facts. Statistics must be available to set forth those facts upon which an effective appeal for remedial action must be based.'

'In prevention work they [statisticians] are required to analyze causes and to determine points and methods of attack. In lightening the burdens that fall upon workers, they are required to measure losses and to show the extent of each type of loss.

'For guiding legislative policies, statistics are indispensable.... Statistics relating to the extent and operation of existing measures point out the need for and suggest the form of appropriate remedial legislation.'

Higher Benefits Needed

While those interested in advancing the cause of workmen's compensation are considering just how to proceed to bring about needed changes, they would do well to avail themselves of every opportunity to raise the size of the weekly benefits where they can do no more. Not only are benefits needlessly low in relation to the losses which they are supposed to compensate, but their very lowness thwarts accident prevention and makes retraining difficult. With such low values placed upon life and limb, there cannot be the efficient administration that would be demanded if injuries were accorded a more important position in the financial affairs of industry. Higher benefits will give a new impetus to rehabilitation in that they will make more necessary and more profitable the salvaging of man-power. With injuries costing more than formerly, restricted medical attention will prove to be an unwise curtailment of expenditure, and the knowledge of surgical science will be made more available to every industrial cripple.

Conclusion

Efforts to improve compensation methods and to make more effective rehabilitation programs must always have, as their ultimate aim, injury prevention. Safety is, after all, the real challenge to industry to-day. At a time when production is increasing by leaps and bounds, and technical efficiency is almost a religion in business, it seems hard to believe that the cause of safety should be slighted. Every step toward the more complete machination of industry is evidence both of increased technical knowledge and of new dangers for the workman. The new dangers demand new methods of prevention; the increased knowledge provides the means. If more and more goods, in an unending variety, are to be produced and enjoyed, then those who are responsible for the producing should be held accountable for safety, and those who use the goods should pay the cost.

NOTES

NOTES

CHAPTER I

1. Several States distribute accident reports minus any date, thus making it impossible to determine what time periods are involved. Other States print the reports from a year to three years late.
2. United States Bureau of Labor Statistics, Bulletin 157; pp. 5, 6.
3. Sidney J. Williams, 'Industrial Accidents,' in *Waste in Industry*, by the Committee on Elimination of Waste in Industry of the Federated American Engineering Societies; p. 331.
4. E. H. Downey, *Workmen's Compensation*; p. 1.
5. G. F. Michelbacher and Thomas M. Nial, *Workmen's Compensation Insurance*; p. 18.
6. These figures were derived from State accident reports and replies to specific requests for accident data. The latest compilation by the United States Bureau of Labor Statistics, Bulletin 490, pp. 14 and 15, shows that in 1927 there were 10,193 fatal and 1,979,830 non-fatal accidents. However, reports were available from only 37 States.

The United States Bureau of Labor Statistics in the *Monthly Labor Review*, January, 1930, pp. 54-64, reported the accident experience of 29 industry groups for 1928. This report will be summarized near the end of the chapter.
7. It might be objected that the industries of the States not included — Arkansas, Mississippi, Florida, North Carolina, South Carolina, and Missouri — are less dangerous than those of the 42 States with compensation laws. It should be remembered, however, that Missouri does considerable manufacturing and building, and that the other States, especially the Carolinas, have made considerable progress in that direction in the last decade.
8. This estimate was printed in Bulletin 275, United States Bureau of Labor Statistics. Apparently the other members of the Bureau were not in complete accord with the procedure followed in the estimate; at least, subsequent bulletins made no reference thereto.
9. In Ohio, for example, the number of workers an employer must have before he must provide workmen's compensation was formerly five; now it is only three.

10. Actuaries interviewed on this subject believed the change in the proportion of workers covered increased about 10 per cent (absolute) during the eight-year period 1919-27.
11. It is sometimes argued that persons not covered by compensation acts are in non-hazardous occupations. It should be remembered, however, that, for political reasons, some extremely hazardous tasks are not covered by workmen's compensation. Furthermore, railway employees in interstate commerce, certain agricultural workers, and workers in very small establishments are excluded. Many construction workers are also omitted from compensation acts because their employer has too few men to require coverage.
12. It is recognized that some duplication may have crept into this computation. On the other hand, there is good reason for thinking of the estimates as minimum estimates, and for at least three reasons:
 - (a) In arriving at the 70 per cent coverage, Dr. Hookstadt made no allowance for the exclusion of employers and employees by reason of failure to elect to come under the compensation acts.
 - (b) The increase in the proportion of workers covered in the eight years since Dr. Hookstadt made his estimate may not have been as much as 10 per cent, as was assumed.
 - (c) An accident to an employee in interstate commerce, to be classed as fatal, must result in death within 24 hours. This provision would have the effect of reducing the number of fatalities but would increase the number of non-fatal injuries.
13. This does not include those injuries which are known as permanent total disabilities. As will be shown later, such injuries result in as much as 100 per cent loss in earning capacity. From the social standpoint they are more serious than is a fatality, because the recipients, although earning little or nothing, must still be fed, clothed, and so forth.
14. Boyd Fisher, *Mental Causes of Accidents*, Boston, 1922.
15. Taken from the *Twelfth Biennial Report*, 1923-24: p. 8.
16. For additional information, see an article by Dr. H. M. Vernon in the *International Labour Review* for May, 1926, entitled, 'The Human Factor and Industrial Accidents.'
17. In their book, *The Health of the Industrial Worker*, will be found a detailed discussion of the effect of artificial lighting on industrial safety.
18. From a printed statement by Mr. Thomas P. Kearns, *The Columbus*

Dispatch, August 11, 1929; p. 3. In Ohio, as well as in certain other States, increases in injury rates are sometimes due to better reporting and to the fact that more workers are being given the protection of the law.

19. From the *Eighth Annual Report* of the Illinois Department of Labor; p. 14.
20. E. H. Downey, *op. cit.*; p. 3.
21. *Monthly Labor Review*, January, 1930; p. 55.
22. G. F. Michelbacher and Thomas M. Nial, *op. cit.*; p. 51.

CHAPTER II

1. For a complete summary of this investigation, see Crystal Eastman, *Work Accidents and the Law*.
2. Injury compensation was provided for certain employees of the Life-Saving Service in 1884. A 1900 law provided that salaries might be paid to injured postal clerks for not more than one year.
3. As late as 1920, only 33.6 per cent of the employees of Alabama were covered by a compensation law, while in Kansas the proportion was 36.9; in Tennessee, 37.2; in Washington, 51.5; in Texas, 47.9. Only one State, New Jersey, had less than 10 per cent of its employees uninsured. Since that time the per cent of coverage has increased, but it still may be said that the number of workers not covered is sufficiently large to constitute a challenge to further extensions.
4. *Life Association News*, August, 1927; p. 992.
5. Statement of John B. Andrews in *The American Labor Legislation Review*, December, 1925; p. 285.
6. As the loss of an arm or a foot. Such injuries, although resulting in only partial disability, are permanent.
7. Maximum weekly benefits range from \$12 to \$25 per week. Many of these maximums were imposed at a time when prices were lower than they now are. While some of the States raised the maximum benefits to keep pace with prices, others did not, thus causing actual reductions in 'real' compensation.
8. Minnesota, Nevada, New York, North Dakota, Oregon, Washington, and West Virginia.
9. The figures comprise the State experiences of policy years 1918-20 inclusive, converted to the basis of New York Schedule 'Z' for the 1920 policy year. The source of the data is *Workmen's Compensation Insurance*, by Michelbacher and Nial, Appendix III; p. 380.
10. In a study of injured persons (to be described later) it was found

that one disabled worker moved his family seven times in one year. Three or four moves during the same period were not uncommon.

CHAPTER III

1. In New Hampshire, compensation for partial disability is 50 per cent of wage loss for a period not to exceed 300 weeks. The maximum weekly payment is \$15. This is the plan followed in most States for those injuries not listed in the schedules. The flat-rate principle in the Wisconsin law is modified by the inclusion of the age factor, which will be considered in Chapter XIV. The California method will be discussed in Chapter IV. In a few other cases there are slight modifications of the flat-rate idea.
2. Contained in a letter from Dr. Hookstadt to the writer, April 9, 1922.
3. E. H. Downey, *Workmen's Compensation*; p. 51.
4. Bulletin 304, United States Bureau of Labor Statistics, September, 1921; p. 117.
5. In all cases, sufficient time was allowed between the date of injury and the date of interview to permit adjustments to be made. In some cases, this was three years. Injured persons often try one job after another. Time is therefore necessary to determine their future economic status.
6. The way in which one's income is spent is, of course, very important; but that need not be considered here.
7. The task of adjusting post-injury earnings to pre-injury wage-rates was not so difficult as might be expected. The years covered by the study were 1923, 1924, and 1925, with a few cases beginning in 1922 and a few continuing into 1926. During this period the general price-level experienced no marked fluctuations. Of more importance to the present study, however, is the probability that wage-rates in general changed very little. The studies of Paul Douglas, and others, support this view. This position is also confirmed by the data arising in connection with the wages of the disabled persons under consideration.
8. This method of computing wage loss does not imply that weekly benefits to injured persons should fluctuate with the rise and fall of the general price-level. Such a procedure may be desirable, but at this point we are interested only in ascertaining the money wage loss attributable to any particular injury. Uninjured workers, as

well as injured workers, experience changes in their real wages; that, however, is a problem of its own.

9. It is recognized that the term 'average' is in some cases rather meaningless. However, it should be remembered that it is being used here in connection with a disability table which is applicable to all persons qualifying under its provisions.

CHAPTER IV

1. The assumption was made on the basis of evidence obtained at the time. The nature of this evidence is discussed in the following pages.
2. Among the most important of these references may be mentioned: *Accidents du Travail, Guide pour l'Evaluation des Incapacités*, by Leon Imbert and others; *Die Beurteilung von Unfallfolgen, Nach der Reichsversicherungsordnung*, by Engel; *Accidents in their Medico-Legal Aspect*, by Douglas Knocker; finally, an Italian work, *Infartuni Degli*, was occasionally consulted.

CHAPTER V

1. From a printed statement by Mr. F. W. Hinsdale, obtainable at the offices of the British Columbia Compensation Board, Vancouver, B.C.
2. The 30 per cent is an assumed rating, presumably based upon past experience, at least in part.
3. The complete schedule lists more than 50 types of injuries, which would result in partial disability, and rates them according to the wage of the recipient at the time of injury.
4. The product, mathematically speaking, is not obtained by multiplying dollars by dollars, but by multiplying \$166.16 by 20.09. The multiplier 20.09 is: $\frac{\$20.09}{1.00}$
5. The present values of \$25 per month (computed at 5 per cent, compound interest) for the designated time periods are:

NUMBER OF MONTHS	PRESENT VALUES
1	\$ 24.90
6	147.87
12	292.12
24	570.17
36	834.82

CHAPTER VI

1. Case No. 73,387, United States Bureau of Labor Statistics Bulletin 281; p. 75.
2. Statement of Mr. Charles H. Verrill, Commissioner, Employees' Compensation Commission, United States Bureau of Labor Statistics Bulletin 281; p. 73.
3. Case No. 13,754, United States Employees' Compensation Law Cases.
4. The World War Veterans' Act, 1924, is printed in a separate booklet and is obtainable at the United States Government Printing Office, Washington, D.C.
5. This happened in spite of a tremendous campaign to inform veterans about the insurance. Even some of the great insurance companies, notably the Metropolitan, ran full-page advertisements in magazines to induce those eligible to take advantage of Government insurance.

CHAPTER VII

1. International Labour Office, *Compensation for Industrial Accidents*, Series M, No. 2; p. 274.
2. For a complete discussion of this question, see an article by Mr. Schnitzler in the *Monthly Labor Review*, December, 1916; pp. 31-69.
3. International Labour Office, *Compensation for Industrial Accidents*, Series M, No. 2; p. 260.
4. For a detailed treatment of this and other features of the German law, see Karl Lippman, *Die Reichsversicherungsordnung*; pp. 1-52.
5. *International Labour Review*, May, 1925, p. 614.

CHAPTER VIII

1. These data were gathered largely through the efforts of the United States Bureau of Labor Statistics. Mr. Ethelbert Stewart, Chief of the Bureau, was secretary of the committee. Dr. Carl Hookstadt, a very active member of the committee, was a compensation expert with the Bureau of Labor Statistics.
2. The California schedule centers about a common laborer 39 years of age, rather than one of 30 years of age. The particular age used as a basis makes little difference if the ratings at that age are correct.
3. Taken from the committee's report, as found on page 75 of United States Bureau of Labor Statistics Bulletin 333. It is worth noting at this point that the committee was composed of some of the ablest

persons in the field of workmen's compensation. Although data were not available on which to base some of the conclusions, the estimates were based upon experience and careful thought.

4. The method will be made clear in Chapter XIII.

CHAPTER IX

1. The same cases referred to in Chapter III, viewed from a different angle.
2. Described in Chapter VIII.
3. This position can readily be explained. Up to age 60, the committee assumed a total absolute increase in loss of earning capacity of 40 per cent, distributed among the age groups as follows: 10, 5, 10, and 15. On the other hand, an absolute increase of only 30 per cent in the same age groups is shown in Figure 1, p. 99 distributed as follows: 4, 6, 13, and 7.
4. It is probable that the experience of a larger number of cases would have the effect of 'smoothing' the age variation lines somewhat. A different arrangement of groupings would probably shift the position of the 'breaks.'
5. Some of the States give consideration to age in determining the average weekly wages of minors on which the award is computed. A boy of 17, for example, would normally be expected to increase his earnings as he became older and more experienced. This method of handling the age factor is especially prevalent in European laws.
6. In connection with the subject matter of this chapter, Dr. E. R. Hayhurst, eminent authority on occupational diseases and public health, points out that if age, wages, and occupation are still underrated, in practice, with respect to the loss of a hand or a leg, a similar and perhaps a more serious condition obtains in high blood pressure, Bright's disease, heart disease, diabetes, and a score of other serious afflictions which pass unnoticed, because not looked for.

CHAPTER X

1. No. 178, Sixty-Fifth Congress.
2. A total of 177,154 had entered training up to April, 1925.
3. In 1921 the rehabilitation of ex-service men was transferred from the Federal Board for Vocational Education to the United States Veterans' Bureau.

4. Sometimes referred to as the Industrial Rehabilitation Act; No. 236, Sixty-Sixth Congress.
5. Certain groups of persons are generally excluded from the service. They are (1) aged or helpless persons requiring permanent custodial care, (2) persons confined in any State, correctional, or penal institution, (3) epileptic or feeble-minded persons, (4) boys and girls under 16 years of age, (5) persons not citizens or prospective citizens of the United States, and (6) those persons who have not been residents of the State for a given period, usually one year.
6. In addition, the Federal Board has divisions for agricultural, industrial, and commercial training.
7. The appropriation for the first year was \$750,000; in each of the two years following, \$1,000,000 was available. In 1924 appropriations were renewed for three years, but no money was available until the early part of 1925.
8. Associated Charities, Rotary Clubs, Red Cross, Chambers of Commerce, and so forth.
9. Found on page 2 of the Hearings before the Committee on Education, House of Representatives, Sixty-Eighth Congress. This estimate was made at a time when only 38 States had rehabilitation bureaus.
10. See an article by Reuben D. Cahn in the *Journal of Political Economy*, December, 1924, pp. 665-89, entitled 'Civilian Vocational Rehabilitation.' Therein it is argued that in 1921 only about 1 per cent of those needing rehabilitation service received it, and that, two years later, less than 5 per cent of eligible persons were given assistance. In addition to a critical analysis of the accomplishments of rehabilitation, Mr. Cahn gives an excellent summary of the development of the rehabilitation idea.
11. The *Annual Report* of the Pennsylvania Workmen's Compensation Bureau for 1924, lists a total of some 700 industrial injury cases which might need rehabilitation service. For the fiscal year ending in June, 1924, the Pennsylvania Rehabilitation Service retrained more than 400 disabled persons, the majority of whom were disabled in industry. It does not follow, however, that what is true in Pennsylvania is true for the States as a whole. The great industrial States will, in the main, show a similar result.
12. In January, 1927, appeared the first issue of the *Rehabilitation Review*, a publication dealing with various phases of rehabilitation. Unfortunately, however, this journal has been discontinued.

13. West Virginia gives to its school children the fundamentals of its workmen's compensation law. A few other States have adopted publicity methods of one type or another. The average injured worker knows little of his rights, duties, and privileges; he knows even less about the opportunities for being retrained and reemployed.
14. A complete discussion of this may be found in the United States Government Bulletin covering the Hearings; pp. 83-98.
15. The Ohio investigation referred to in preceding chapters is the source of most of the data hereinafter presented.
16. In this connection it might be well to observe that nothing can be proved *absolutely* by statistics. The most that can be done is to establish a presumably reasonable case. If the foregoing data do not offer any proof that retraining brings results, then it probably is impossible to show the efficacy of any type of training, whether such be for an athletic contest, a profession, or a business position. Such a viewpoint, however, is incompatible with the common viewpoint of most persons.
17. Totally disabled in the sense that they had little or no earning power.
18. *Vocational Rehabilitation of Disabled Persons*, published by the Federal Board for Vocational Rehabilitation. Misc. 1007; p. 34.
19. These figures are taken from those used by the Committee on Statistics of the I.A.I.A.B.C. See United States Bureau of Labor Statistics Bulletin 359; p. 22.
20. This sum is not the present value of expected future gains, but merely the total accumulated gains during the period of work expectancy. If the present value was desired, it could be found by answering this question: How much will annual payments of \$300, at an assumed rate of interest, amount to in 20 years?
21. It may be objected that once this \$128.71 is invested in a disabled person, it is never returned, and that, therefore, the total cost is \$128.71 plus interest in perpetuity. It should be noted, however, that the increased earnings could also draw interest, and would accumulate at a more rapid rate than would the interest charge on the amount of the investment.
22. Many employers overestimate the likelihood of second injury cases. Out of 1,500,000 claims for compensation, there were found only 40 second injury cases resulting in total disability.
23. For a complete discussion of the Ford Motor Company's activities

in rehabilitation, see a paper by Dr. J. E. Mead, the company's chief surgeon, in the *Proceedings of the International Conference on Rehabilitation of the Disabled*, New York, March, 1919.

CHAPTER XI

1. Statement of Mr. William J. French, found in United States Bureau of Labor Statistics Bulletin 333, 1923; p. 284.
2. In some of these jurisdictions, the employer or insurance institution pays a lump sum which is delivered directly to the beneficiaries; in others, the payments are first made to a judicial authority or to a special fund.
3. In some of these countries, the pension can be commuted for a lump sum, as in Austria and Poland. In Germany, commutation can take place only in case of incapacity of less than 20 per cent.
4. International Labour Office, *Studies and Reports*, Series M, No. 2, 1925; p. 220.
5. *Monthly Labor Review*, May, June, July, and December, 1919.
6. Special Report of the New York State Employers' Liability Commission.
7. A study made by the statistical division of the Travelers' Insurance Company, printed in *Mass Protection*.
8. Sec. 102.09, 3, a.
9. A description of the California Study is contained in a pamphlet of the California Industrial Commission, entitled *A Rational Death Benefit*.
10. A California case, as described by an official of that State.
11. An Ohio injury case.
12. *Cost of Living in the United States*, United States Bureau of Labor Statistics Bulletin 357, 1924.
13. Paul H. Douglas, *Wages and the Family*; chap. III.

CHAPTER XII

1. *Waste in Industry*; p. 332.
2. J. L. Cohen, *Workmen's Compensation in Great Britain*; p. 46.
3. Federated American Engineering Societies, *Waste in Industry*; p. 333.
4. American Museum of Safety, *Safety*, January-February, 1926; pp. 3-8.
5. For a complete account of accident prevention in the Ford plants,

- see an article by R. A. Shaw entitled, 'Safety Work in the Ford Organization,' in *Safety*, January-February, 1926; pp. 17-26.
6. These 'conditions' may be due to physical irregularities, such as the absence of machine guards; or, as noted in Chapter I, they may be due in large part to such factors as faulty instruction, poor discipline, and so forth. Whatever be the cause, the problem is essentially the same. It is one of finding ways and means of correcting these faults wherever they exist.
 7. The term 'concern,' as used in this chapter, applies to all employers subject to workmen's compensation laws. As was shown in Chapter I, building construction has come to be one of the most hazardous occupations. Transportation and trade likewise account for a considerable number of injuries. In Massachusetts, for example, the order of industries, from the standpoint of the annual number of fatalities, is transportation, building trades, trade, iron and steel, textiles, and so forth. This order will vary from State to State, depending upon the prevailing types of industries.
 8. Data obtained from an article by Mr. Ethelbert Stewart, United States Commissioner of Labor Statistics, in the *Monthly Labor Review*, January, 1928; pp. 67-72.
 9. *The Industrial Bulletin*, New York State Department of Labor, August, 1927; p. 307.
 10. A. C. Callen, *Mining Congress Journal*, July, 1926; pp. 494-500.
 11. *Ibid.*; pp. 494-500.
 12. Mr. Harry Plythyon in his book, *The Rock Dust Remedy*, published by the Belle Vernon Agency, Belle Vernon, Pa., takes issue with the United States Bureau of Mines over the question of the effectiveness of rock dusting in reducing mine explosions. Mr. Plythyon takes the position that too much emphasis has been placed upon the coal-dust theory of explosions, and not enough attention has been given to explosive gases. These gases, he contends, are due to faulty ventilation. The controversy about the cause of accidents is one of mining technique. It is not our purpose to take sides in this issue. Either theory is in accord with the contention of this chapter, namely, that mine disasters can be lessened if only the money will be spent for that purpose.
 13. *The American Labor Legislation Review*, June, 1927; p. 134.
 14. Taken from the *New York Times* of April 3, 1927. The article refers to an arrested mining disaster near Washington, Pa., on April 2, 1927.

15. A. C. Callen, *Mining Congress Journal*, July, 1926; pp. 494-500.
16. The fear of the competitor is a great deterrent to all kinds of attempted labor legislation. It exists between two companies, between the industries of one State and those of another. It exists between nations.
17. W. H. Cameron, *The Problem of Industrial Safety*, United States Bureau of Labor Statistics Bulletin, 359; p. 118.
18. The Federated American Engineering Societies, in investigating wastes in industry, found that there were many ways in which companies might have reduced their costs, but that they did not do so largely because competing firms were equally inefficient, and none felt the urge to do better.
19. Harry G. Brown, *The Economics of Taxation*; chap. VI.

CHAPTER XIII

1. In California the base was the loss to a common laborer of an arm at the shoulder. The figures used here are not those for a common laborer or any other particular type of worker. They represent the results obtained from a review of the experiences of workers in many occupations, as disclosed in the Ohio investigation.
2. If the injured person is normally left-handed, the opposite procedure would be followed.
3. The actual difference in the loss of earning power was about 5 per cent (absolute). The rating on which the 2.5 per cent adjustment is made is an average for both right and left members.
4. In Bulgaria injured workers are divided into five general classes, according to the amount of daily wages, as follows:

DAILY WAGES	ANNUAL PENSION
Up to 15 leva	3600 leva
16 to 30 leva	4800 leva
31 to 45 leva	6000 leva
46 to 60 leva	7500 leva
61 and over	9000 leva

It should be noted, however, that the above classification is based upon wages, and not upon the amount of skill required to pursue an occupation. Wages are not always a measure of skill and are, therefore, not always a measure of adaptability. In support of the Bulgarian plan, it can be said that the annual pension does not increase as rapidly as the daily wage, and to the extent that wages measure adaptability, the fivefold wage classification is permissible.

5. If such a system were adopted and careful records kept, it would be only a relatively short time until enough data would be available to assist in the work of classification. Especially would this be true if similar methods were employed in several States, and the combined results tabulated and used.
6. In preceding chapters, considerable attention was given to the mentality of the worker. At this point, it should be noted that there is a direct relation between age and mentality, in the sense that the aged worker has a slower reaction to any given set of conditions than has the younger man.
7. Since Class B occupations stand approximately midway between the other two classes, they may be thought of as being representative of all occupations.
8. The per cent of average weekly wages paid as compensation in Wisconsin.

CHAPTER XIV

1. It has been argued in some quarters that, if compensation benefits are made too liberal, some persons will deliberately injure themselves. This position does not seem sound. Once injured, some persons may deliberately prolong the healing period, but most workers would be unwilling to take the chance which accompanies a deliberate injury.
2. No State has ever made even a beginning in such a campaign. In Ohio, for example, 1 per cent of the premiums collected is used for safety work — one dollar for prevention, ninety-nine dollars for cure! Is it any wonder that there are so many industrial accidents?
3. E. H. Downey, *Workmen's Compensation*; p. 14. It will be recalled that in Chapter XII the question of the incidence of workmen's compensation premiums was raised. Mr. Downey, in the above statement, proceeds under the assumption that increased premium costs will invariably be added to the cost of the product. It is important to note that the truth or falsity of this assumption is not pertinent at this point. The only important fact (according to Downey) is that the cost, however distributed, is not prohibitory. A question of much greater importance raised by the quotation is whether such a relatively small increase in premium costs would be of sufficient importance to make further accident reduction possible. In Chapter XII it was argued that it was not the total premium cost that was important, but rather the cost to an individual pro-

ducer. Whether the single producer will be induced to try to prevent accidents will depend upon the type of rating system employed for the determination of premium rates within the industry and in each establishment. It should also be remembered that, through a system of penalties of various kinds, it may be possible to bring pressure to bear in individual cases when the premium is unproductive of results.

4. An argument sometimes used to justify the difference between compensation and wage loss is the principle of occupational risk. According to this principle, full compensation should not be given because some accidents are the fault of the worker. This principle had its origin in the employers' liability laws.
5. Workmen's Compensation Act of Wisconsin, with 1925 amendments; p. 17.
6. R. M. Woodbury, *Workers' Health and Safety — A Statistical Program*; pp. 13, 14.

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