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EDITED BY RICHARD T. ELY

WORKMEN'S COMPENSATION

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EDITED BY RICHARD T. ELY

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WORKMEN'S COMPENSATION

By E. H. DOWNEY, PH.D.

WORKMEN'S COMPENSATION

BY

E. H. DOWNEY, PH.D.

LATE COMPENSATION ACTUARY OF THE INSURANCE DEPARTMENT
OF PENNSYLVANIA AND OF THE PENNSYLVANIA COM-
PENSATION RATING AND INSPECTION BUREAU

AUTHOR OF "HISTORY OF LABOR LEGISLATION IN IOWA" AND
"HISTORY OF WORK ACCIDENT INDEMNITY IN IOWA"

New York
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To E. K. D.

**FOR VERY FAITHFUL HELP AND COUNSEL THIS
BOOK IS GRATEFULLY DEDICATED**

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PREFATORY NOTE

MR. E. H. DOWNEY had reached the position, at the time of his death, of the highest American authority on the subject of Workmen's Compensation for Industrial Accidents. This book fully justifies that distinction. It is not loaded with technical details, but is designed for the general reader and the citizen; but it shows such firm mastery of the subject and such clear and convincing presentation of the facts and arguments, as to be indispensable for all who desire to see this important branch of labor legislation brought up to standards that are adequate, discriminating, and practicable.

JOHN R. COMMONS.

AUTHOR'S FOREWORD

WORKMEN'S compensation embodies an ideal of social justice wholly foreign to that eighteenth century philosophy which inspired the founders of our government. "The public good," wrote Blackstone, "is in nothing more essentially interested, than in the protection of every individual's private rights. So great, moreover, is the regard of the law for private property that it will not authorize the least violation of it, no, not even for the general good of the whole community."¹ To Blackstone's contemporaries it seemed self-evident that liberty is the absence of restraint² and that every man, if left perfectly free to pursue his own interest, will be led by an invisible hand to promote the interests of society.³ Every man was presumed to know his own rights and to be equally capable of maintaining them. Differences of wealth, rank and education were looked upon as God-given inequalities which the state had no right to curtail or neutralize.⁴ Equality before the law was deemed all-sufficient to secure the ends of justice.⁵ Government had only to preserve the peace and prevent force and fraud.⁶

It is in keeping with this leave-them-as-you-find-them theory of social relationships that the individual workman shall take upon himself the risks of his employment. Bodily injury, unemployment and early superannuation are incidents of the trade which a reasonable man must expect to encounter when he becomes a coal miner, a carpenter or a railway brakeman. It is open to every man to choose his own occupation, **to quit** any service which he

finds exceptionally dangerous or disagreeable and to exact a wage which will enable him to provide against the contingencies of sickness, accident, premature death, unemployment and old age.⁷ The employer has no responsibility beyond the payment of the market rate of wages. The cash nexus is the sole recognized bond of union.

Securely rooted in the social philosophy of William Blackstone and Adam Smith, of Jeremy Bentham and Chief Justice Shaw, the common-law doctrine of assumption of risk⁸ held its ground so long as that philosophy appealed to current common sense. But as time passed the rights of private property came to hold a lower, and human life and happiness a higher place in men's esteem. That untrammelled individualism which seemed indefeasibly right and good to our great grandfathers has given place to a sense of social solidarity. Democratic governments more and more concern themselves with measures designed to promote the general good at the expense of restraint upon the pursuit of self-interest. Both by extension of the police power and by the principle of collective responsibility the modern state seeks to secure the health, safety, comfort, and education of all its citizens.⁹ In no field of economic relationship have the new ideals of social justice enforced a more drastic reconstruction of traditional views than in that of employers' responsibility for the risks of industrial employment. Death or disablement by accident or disease in the course of work, unemployment by reason of industrial depression or of irregular operation, displacement in the early fifties by the demand for speed and adaptability—are contingencies imposed upon the wage worker by the organization and conduct of modern industry. That the wage loss which results from these contingencies should be shifted from

the individual workman to the general body of consumers is a doctrine already accepted by the major part of civilized mankind. In the United States the new principle has thus far been applied only to occupational injuries. But that sickness, unemployment and old age will soon or late be brought within the scope of collective responsibility few will doubt who have followed the course of social insurance in other countries.

It is as a branch of social insurance that workmen's compensation is treated in these pages. What is had in view is not so much a descriptive analysis of existing compensation systems, nor a technical treatise on compensation law or compensation insurance, as a critique of standards for the indemnity of work injuries. Of technical treatises there is already a superabundance. The insurance actuary, the practising lawyer or the commissioner whose business is the decision of cases finds an embarrassment of material ready to his hand. Little of this material is accessible to that general public whose mass opinion, in the long run, shapes the course of legislation. To the non-specialist, actuarial disquisitions speak an unknown tongue and legal case books are a weariness to the flesh. Yet many are interested in workmen's compensation as a social problem who neither need nor desire to master technical intricacies. To the general public, then, this little book is addressed. If it shall prove to furnish the matter needed for an informed opinion on the problem with which it deals it will have served its purpose.

Most of the ground herein covered has been previously traversed in the writer's *History of Work Accident Indemnity*¹⁰ and in sundry articles contributed to the *Journal of Political Economy*, the *Annals of the American Academy of Political and Social Science*, and the *Proceedings of the*

Casualty Actuarial and Statistical Society of America. The present work is, however, wholly new in the sense that no page or paragraph has been taken bodily from any earlier book or article. The foot notes are intended primarily to supply details with which it was not desired to cumber the text and to afford guidance to those readers who may wish to pursue special topics. Statements of fact for which no specific authority is cited are made upon the writer's personal knowledge. The bibliography lists the most useful works of reference under topical headings.

The writer's thanks are due first of all to the Editor of this Series, Dr. Richard T. Ely, for opportunity and stimulus to undertake the preparation of this work and for a careful reading of the manuscript. Special acknowledgment must be made to Mr. G. C. Kelly, Manager; Miss Myrtle E. Snyder, Statistician and Miss Josephine B. Carson, Librarian of the Pennsylvania Compensation Rating and Inspection Bureau—to Mr. Kelly for indispensable aid in the preparation of Chapter VI, to Miss Snyder for a painstaking literary and factual criticism of the entire manuscript and for most of the statistics employed in the illustrative tables, and to Miss Carson for the collection of source materials, the preparation of the bibliography and the verification of references. Without the aid and encouragement of these friends this work would never have been completed. Dr. Mary L. Shine of the Institute for Research in Land Economics and Public Utilities revised the printer's copy.

E. H. DOWNEY.

NOTES

¹ *Commentaries on the Laws of England*, Vol. I, p. 138; Sherwood ed., Philadelphia, George W. Childs, 1866.

² "All systems either of preference or of restraint, therefore, being thus completely taken away, the obvious and simple system of natural liberty establishes itself of its own accord."—Adam Smith, *The Wealth of Nations*, Book IV, Ch. IX.

³ "Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society which he has in view. But the study of his own advantage naturally, or rather necessarily leads him to prefer that employment which is most advantageous to the society. . . . He generally, indeed, neither intends to promote the public interest nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention."—*The Wealth of Nations*, Book IV, Ch. II.

⁴ Bonar's *Philosophy and Political Economy*, Book III, Chs. II and III; Cunningham's *Growth of English Industry and Commerce*, *Modern Times*, Part II; Toynbee's *The Industrial Revolution*, p. 148, ff.; Veblen's *The Preconceptions of Economic Science*, in *The Quarterly Journal of Economics*, Vols. XIII and XIV; Bohlen's *Voluntary Assumption of Risk*, in the *Harvard Law Review*, Vol. XX.

⁵ Said Mr. Justice Maule, in sentencing a poor prisoner for bigamy: "You should have consulted an attorney who would have told you that by the expenditure of some £500 or £1000 you might have obtained a divorce and been free to marry the woman of your choice. And if you tell me you never in your life had so many pennies at one time I must remind you that it hath ever been the glory of the law of England not to have one law for the rich and another for the poor." Cited by Pound in 8 *Columbia Law Review*, 616.

⁶ Cf. Jefferson's Inaugural Address, 1801, in Ford's *Writings of Thomas Jefferson*, Vol. VIII, pp. 1, 4.

⁷ For competent summaries of the laissez faire philosophy as applied to industrial injuries see remarks of Chief Baron Abinger in *Priestly vs. Fowler*, 3 Meeson and Welsby 1 (England, 1937) of Chief Justice Shaw in *Farwell vs. Boston and Worcester Railroad Corpo-*

ration, 4 Metcalf 49 (Massachusetts, 1942) and of Lord Bramwell in *Thomas vs. Quartermaine*, Law Reports, 18 Queen's Bench Division, 685 (England, 1887).

⁸ The fellow-servant rule itself is but a special case of assumption of risk, which in turn is a corollary of *Volenti non fit injuria*. That the system of legal dogmas which make up the common law of employer's liability is grounded upon the economic preconceptions of Adam Smith has been pointed out by every student of the subject. See Downey, *History of Work Accident Indemnity*, Ch. I I, and authorities there cited.

⁹ For modern conceptions of the state and of social justice see Ihering, *Der Zweck im Recht*; Freund, *The Police Power*; Pound, *Do We Need a Philosophy of Law*, in the *Columbia Law Review*, Vol. V, and several articles by the same author in the *Harvard Law Review*; Holmes, *Law in Science and Science in Law*, in *Collected Legal Papers*, the opinion by this most eminent of our living jurists in *Noble State Bank, vs. Haskell*, 219 United States 104 (1917) and several of his dissenting opinions in labor union cases.

¹⁰ The State Historical Society of Iowa, 1912.

INTRODUCTION TO E. H. DOWNEY'S WORKMEN'S COMPENSATION WITH SOME BRIEF OBSER- VATIONS ON INSURANCE IN GENERAL

OF all the various kinds of economic undertakings few have greater present significance than insurance. Insurance is so varied that it comprises many different sorts of business; but all of these, on account of common characteristics, may be grouped in one great class. The magnitude of these businesses increases by leaps and bounds and their resources now comprise a considerable proportion of all the wealth of the United States. It may be doubted, also, if there is any other single agency which does more, on the one hand, to increase the wealth of the United States, and, on the other, to prevent or mitigate misfortune of an economic character.

There is the closest connection between the social and economic problems of our day and this matter of insurance. A strong and vigorous man is in general able to take care of himself; but there are certain contingencies in life against which no human being is able to guard himself effectively by any individual process. Through association with his fellows, however, man may make economic provision for these contingencies against which individually he cannot safeguard himself. This is so because that which is a contingency or chance for the individual becomes a regular normal happening when great masses of men are taken into account. It is not necessary here to elaborate this well known principle upon which insurance rests.

The various kinds of social insurance which are generally

needed, especially by those having comparatively limited economic resources, have been enumerated under six heads. They are as follows: First, insurance to defray expenses of the education of children in case of death of the insured; second, insurance to defray the expenses and provide for the support of old age; third, insurance to provide for burial; fourth, insurance to provide for a period of inability to work on account of accident or injury of any sort; fifth, insurance for a period of illness; and sixth, insurance to carry one over periods of enforced idleness due to lack of demand for labor.

The present work deals with compensation for accident, which is one of the most important kinds of insurance. Accident is now generally considered to be a part of the process of production. The modern idea is not that the employer is to be made to pay damages, nor that the employee is to carry the burden of accident to his person, whether it is of a temporary character or, as too often happens, lifelong in its effects. Accidents are part of the industrial process and they are inevitable. They are, therefore, to be considered as part of the costs of production. This represents a tremendous advance upon the practice of earlier days, when employees sought to hold employers responsible and sometimes collected very heavy damages, and when, on the other hand, the employer sought to escape ruinous liability.

Insurance then has as one of its chief functions to lessen the jolts and jars, as it were, to equalize the shocks in our economic system, and it is contributing incalculably to the relief of human suffering and the promotion of human well being. In all advanced countries those who take a broad view of the economic situation and are moved by an earnest desire to lessen suffering and promote the gen-

eral welfare are striving to extend the scope of insurance until all contingencies are provided for, through development of all the kinds of insurance which have just been mentioned; and indeed there are suggestions of still further developments of the field. All this is praiseworthy, but recent experience of many different kinds and in many different places suggests that it is necessary to proceed cautiously if insurance is to be safe; and safety comes first in insurance. Insurance is to guard against contingencies, and risk is the very essence of contingencies, against which every precaution is to be taken.

Insurance is costly and the liabilities of some kinds of modern insurance are assuming staggering proportions. Insurance of the kind considered in the present work is costly, but still more costly is that which provides for old age, and probably the most costly of all is that which aims to provide for unemployment. A few words of caution in the interest of insurance are required.

While we are extending insurance, we must at the same time attempt to reduce the cost of insurance to the lowest possible limits, so far as the burden of compensation for accidents is concerned, and so far, also, as insurance to provide for old age and unemployment is concerned. We must weigh in each case what are the possibilities as well as the indirect consequences. Unless we take measures of this kind, there is strong reason to fear that insurance may be extended beyond economic possibilities and that public treasuries may be bankrupted.

In the case of workmen's compensation efforts are being made to reduce accidents so as to lessen the burden. Wisconsin, through the Industrial Commission, has made praiseworthy efforts of this sort, and so have other states. The statistics, however, of accidents involving compen-

sation are somewhat disappointing as Dr. Downey shows in the present work. Further efforts must be made along this line, and in the interests of workmen every effort must be supported that gives them an interest in the lessening of accidents. There is danger that, unless caution is taken, workmen may become careless and indifferent in too many cases, feeling that provision is made for them in case of accident. This criticism was made of the German workingmen's insurance before the World War, and the criticism came even from friendly sources. There can be no doubt that in too many cases workmen were indifferent to measures to prevent accident and that, on the other hand, they too frequently made more of their ailments than was necessary. This difficulty, however, is encountered least of all in the case of accidents, but applies especially to invalidism, where control is more difficult and where it is easier for a person to deceive even himself. In this introduction it is impossible to enter into details, but these are cautions suggested in the interest of the great enterprise described in the present book.

I should like to digress somewhat from the particular kind of insurance discussed in the present work and to consider provision for old age, which usually takes the form of pensions of some sort or other.

Now, just as workmen's compensation should carry with it every inducement to lessen accidents, so old age pensions should be reduced to the lowest limits by a variety of measures. What is most fundamental of all is that a pension should not be granted prematurely: and that an effort should be made to find economic usefulness so long as this is possible, so that there may be a return given for what is received. We are discussing continually now the extension of the length of life, and few topics apparently

awaken more general interest. It is a doubtful blessing, however, for life to be extended unless at the same time opportunities are afforded for the employment of one's faculties in the lengthened period of life. Cessation of activity for those who have for scores of years been engaged productively, means unhappiness and a premature decaying of powers. We see this very often in the case of retired farmers, and many a village cemetery has numerous graves of retired farmers who fretted and worried and nursed their ailments until they became fatal. If they had continued their activity, they might have lived longer and been happier.

The system of pensions is extending rapidly and is a menace to our public treasury. Pensions to those who served in the wars of the United States afford striking illustration, and if industrial pensions are extended and not carefully safeguarded, the burden will become greater than that of the war pensions and will be intolerable—leading to financial ruin and bankruptcy.

Let us take the case of a policeman in an American city. When should he be retired? Should he be retired when he is no longer able to patrol the streets of a great modern city? He may not be equal to the strenuous efforts required when he at times encounters bandits, and to the physical exercise and activity involved in protecting pedestrians and others at street crossings; nevertheless, he may be strong enough for many kinds of activity in the public service. There must be no cast iron rules for retirement; but in all occupations men must be continued just as long as they are capable of service, and efforts must be made to find some kind of employment which may be suitable for each age period so long as the possibilities of economic usefulness persist. To take again the case of

our policeman—the experience which he has gained in his early life may render him especially useful in some other branch of the municipal or state service.

Life insurance, now that it has come to be placed—after great struggle and loss and suffering—upon a sound actuarial basis, provides the least difficulty. On the contrary, it helps in solving all the problems of contingencies because it encourages thrift and accumulation as nothing else does. It adds immensely to the wealth of society and to the convenience and comfort of those insured. It even helps the uninsured, because it increases so vastly the amount of disposable capital.

For the kinds of insurance that we are now discussing, and above all for that most difficult question of all kinds of insurance—namely, insurance against unemployment—we must seek the possible and desirable limits and then find a sound actuarial basis for what we undertake. It is essential that the burden to industry and to the state should be reduced to the lowest possible limits by doing everything humanly possible to lessen accidents, invalidism and premature cessation of useful economic activity. So far as insurance against unemployment is concerned the limits must probably always remain narrower than one could wish. It is not enough that such insurance should never be an encouragement to idleness. It must not impede that desirable transfer of labor and capital from one pursuit or occupation to another because this transfer as a result of search, sometimes painful, makes our economic activities more productive than would otherwise be possible. It is this effort to find our niche or location in economic field that makes our economic society dynamic rather than static. If we are to continue to be a progressive society men must feel the pressure to find

a place for useful employment. Unemployment insurance has then somewhat narrow limits and perhaps more will be accomplished by indirect than by direct methods to prevent that terrible evil—unemployment. It is an awful thing for a willing worker to be without employment while his family is in want, and everything possible must be done to prevent this evil; but this is not the place to enter into the various indirect as well as direct methods that are available.

Probably no one was better qualified to discuss that important phase of insurance, workmen's compensation for industrial accidents, than the author of this book, the late Dr. E. H. Downey. The loss occasioned by his accidental death, July 9th, 1922, is keenly felt by those working in his field as well as by students of the subject.

Dr. Downey was born in Selma, Iowa, December 27th, 1879. He was educated in the schools of Iowa, receiving the degrees of Bachelor of Arts and Master of Arts from the University of Iowa, and later receiving the doctorate from the University of Wisconsin. While occupying successively the positions of fellow in economics at the University of Chicago, research associate of the State Historical Society of Iowa, assistant and later lecturer at the University of Wisconsin, associate professor of economics at the University of Missouri, and professor of economics at Kenyon College, Dr. Downey diligently applied himself to the study of his chosen subject. With this academic preparation Dr. Downey combined practical experience as chief statistician of the Wisconsin Industrial Commission, consulting actuary of the Delaware Industrial Commission and compensation actuary of the Insurance Department of Pennsylvania and the Pennsylvania Compensation Rating and Inspection Bureau. He was the author of

History of Labor Legislation in Iowa, History of Work Accident Indemnity in Iowa and of some thirty articles published in scientific magazines.

The tribute paid Dr. Downey at the time of his death by men in the scientific and practical fields is gratifying to all who knew him. I quote here Mr. Thomas B. Donaldson, former Insurance Commissioner of Pennsylvania.

"He possessed every attribute of a skilled actuary, plus common sense and practical aims of the broadminded insurance men. He was of most aggressive and dominant personality, a fighter in every sense of the word, where fact was basic and breadth was required, and the best interests of the public and the home offices were at issue.

"He could have joined with any of several insurance companies **at** a salary three or more times that which he received as a State employee, but he had no interest in the commercial aspect of his work. He was a scientific investigator with thoroughly practical ultimates **and** intense affection for and devotion to insurance.

"His personal and official integrity was as dominant as his physical strength and mental capabilities. The Insurance Department of Pennsylvania in publicly paying tribute to its esteemed former associate expresses the sentiment of the entire insurance world in **that** a loss almost irreparable has been sustained in Mr. Downey's untimely death."

The present volume, *Workmen's Compensation*, is the result "of mature deliberation, careful thought and many readings," and shortly before his death, Dr. Downey had completed the manuscript and prepared it for the press. Dr. Mark A. Smith, of the Institute of Economics, has most generously given of his time to read the manuscript carefully and incorporate in the text and in the notes, the results of new Workmen's Compensation legislation passed since Dr. Downey's death.

The style and choice of words are excellent and the illus-

trations are well chosen. The idea **of the book** is **not to** furnish actuarial or legal information, but to "furnish the matter needed for an informed opinion on the problems with which it deals." Dr. Downey felt that since the human organism is imperfectly adapted to a mechanical environment, work injuries, in the main, are attributable to inherent hazards of industry. Each industry has its characteristic hazards, the total number of which, after careful study, can be predicted. The crux of the compensation system is found in the scale of benefits. Dr. Downey held that compensation is remedial rather than preventive. "It aims to relieve the suffering of the injured workman, to restore earning capacity as far as possible, and to make good to himself and to his dependents the wage loss which results from his disability or death." Indirectly it promotes industrial safety by adding a pecuniary incentive to the humanitarian interest of employers. The primary functions of compensation insurance are the distribution of risk and the security of deferred payments. From the standpoint of modern democracy unavoidable losses should so be distributed as to impose the least hardship upon individuals and to result in the smallest diminution of the community's economic assets.

RICHARD T. ELY.

Madison, Wis.

February, 1924

WORKMEN'S COMPENSATION

WORKMEN'S COMPENSATION

CHAPTER I

THE SOCIAL COST OF INDUSTRIAL INJURIES

Industrial injuries¹ in the United States annually cause at least twenty-five thousand deaths, a like number of serious permanent disabilities and some two million temporary disabilities of more than three days' duration.² Peace has its perils no less than war; work accidents in the aggregate are equivalent to the losses of a perpetual campaign. Of deaths alone the twelve months' total is four times **the** number killed and mortally wounded in the battle of Gettysburg; of permanent injuries the annual sum surpasses the yearly average of the Civil War. The total casualties of the American Expeditionary Force in the World War did not equal the casualties to American workmen in peaceful employments between April, 1917, and the signing of the Armistice. The toll of life and limb exacted by American industries during the second decade of **the** twentieth century exceeds the nation's losses in battle from the Declaration of Independence to the present day.

Economically considered, the direct loss to the nation from industrial accidents is not short of one billion dollars annually. Temporary disabilities alone cause a yearly loss of more than six million working weeks. But the social cost of these minor injuries is small in comparison with **the** cost of deaths and permanent disabilities. The victims of **work** injuries are chiefly men in **the** prime of life, since it

is precisely the young and vigorous who predominantly engage in the extra-hazardous employments.³ A fatality, upon the average, cuts off twenty years of productive labor and a permanent injury causes a continuing economic loss proportionate to the age of the worker and the degree of incapacity. Upon the average, accordingly, each death or permanent total disability is equivalent to two hundred and fifty temporary disabilities of four weeks' duration. Reckoned in the same manner, the loss of a hand is equal to five hundred weeks of total disability and the blindness of one eye entails an ultimate loss of six years' labor. Weighting the deaths and permanent disabilities in accordance with the International Scale of Severity Rating,⁴ and adding in the temporary disabilities, the aggregate yearly time loss on account of industrial accidents in the United States is equivalent to forty million working weeks. Taking all industries together, the accident loss amounts to canceling one week's production in every year; for bituminous coal miners it comes to one-tenth, and for structural iron workers to one-fifth of normal full time. All this takes no account of industrial diseases, of which there are only meager and fragmentary records, nor does the estimate of one billion dollars annual loss of potential earnings include the cost of medical and hospital care for the injured.

There is little prospect that this enormous wastage of human life and of productive capacity will appreciably diminish within the predictable future. The safety movement has achieved some notable triumphs, both in individual plants and in wide-spreading industries, yet there are few examples of a permanent reduction in accident severity rates. A concerted "drive" in safeguarding and in the safety education of superintendents and workmen

produces a falling off, only to be followed by a subsequent increase— Thus the annual time loss per man in a group of selected steel mills which have long made a special feature of "Safety First" rose from 9.1 days in 1915 to 12.4 days in 1918,⁶ and the fatal accident rate per thousand full-time workmen in by-product coke plants rose, within the same period, from 1.75 to 2.84.⁶ The fatality rate per million tons of coal in the bituminous mines of Pennsylvania rose sharply from 1890 to 1900, remained nearly stationary through the first decade of the present century, fell steadily to its lowest point in 1916 and rose again through the three following years,⁷ (See graph.) Wisconsin has for ten years stood at the forefront of the safety movement, yet the accident rate per thousand employees in the industries of Wisconsin was higher in 1920 than in 1915.⁸ All the while, in fact, the inherent trend of industry sets toward increasing scale, complexity and speed of operation, increasing use of machinery, increasing weight of materials and products, increasing substitution of unskilled for skilled workmen, and increasing control by absentee capitalists with an eye single to net profit—each an independent cause of greater accident frequency and all co-operating to enhance the hazards of industrial pursuits. In face of these cumulative changes, all acting steadily in the same direction, "Safety First" will do well to hold its own over any ten-year period.

Nowhere are these tendencies of large-scale production better exemplified than in iron and steel manufacturing—at once the type and the pace-maker of modern industry. Forty years ago there were more than a thousand separate steel mills in the United States, owned by numerous competing corporations and rarely, if ever, employing so many as five hundred persons in a single plant. The processes

WORKMEN'S COMPENSATION

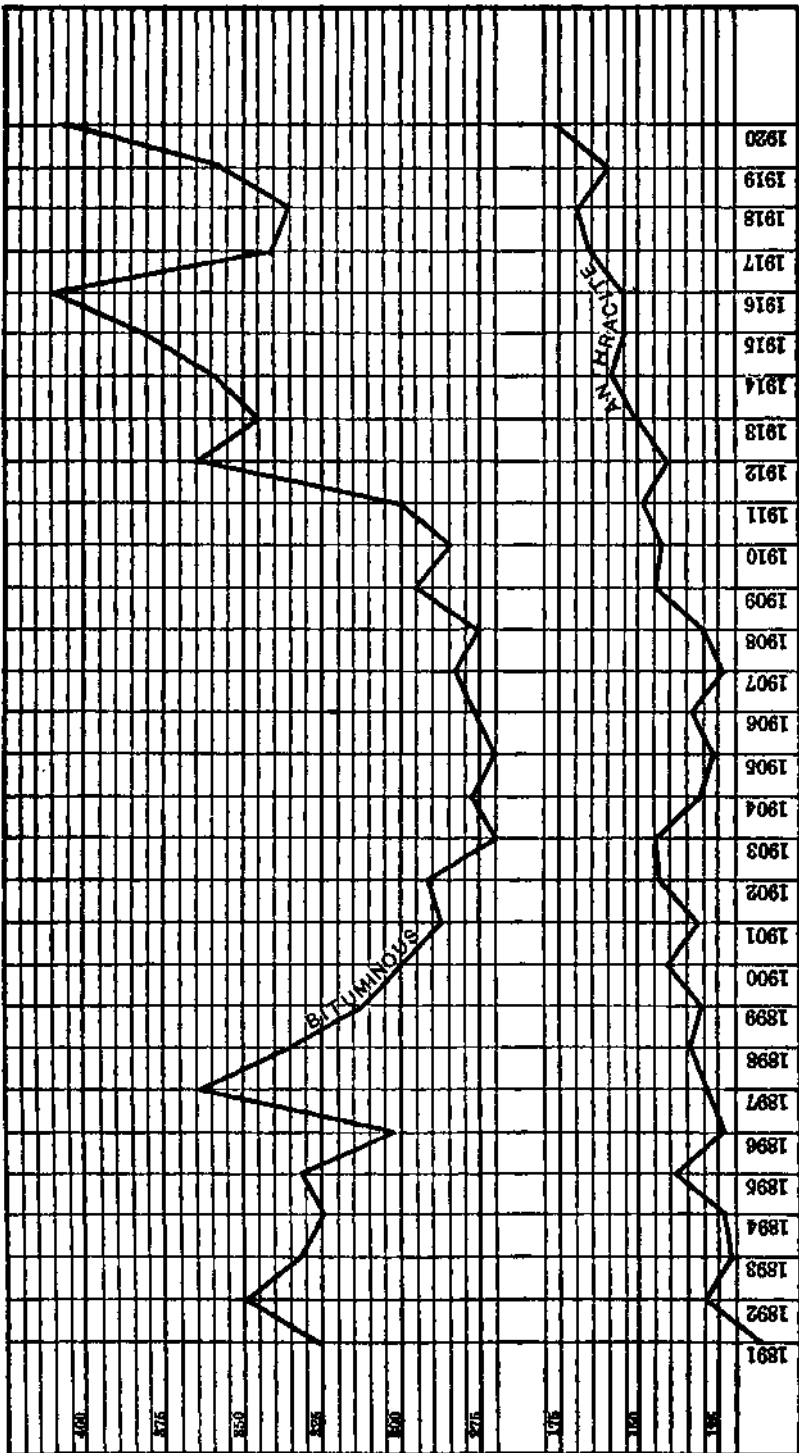


FIG. I

were still so far manual that personal skill counted for much in the result; the managing owners had still some personal oversight of the operations and nine-tenths of the operatives were of American or British birth.⁹ The new era set in with the inauguration of the trust movement, a generation since. The number of establishments has fallen off by sixty per cent, as compared with 1880, while the number of employees has doubled and the product has increased seven-fold. The typical steel mill of to-day is an aggregation of blast furnaces, coke ovens, open hearths, rolling mills, forge shops and foundries, with a railway system of its own, and not infrequently a coal and ore dock in connection. The number of workmen in such a plant runs into thousands¹⁰ and intelligence on the part of the rank and file is so little valued that four-fifths of the operatives are "Hunkies," "Polocks" and "Dagoes," who are ordered about by signs and are barely able to swear in English. The unit weight of product has grown with the size of establishment: the 200-inch ship-plate, the 48-inch I-beam, the 120-pound rail and the 100-ton gun are achievements of our own day. The integration of ownership has kept pace with technological development, in so much that three affiliated combinations control all the important plants, substantially the whole visible supply of iron ore, a great part of the coking coal, the means of transport which link the mines and mills, and a wide range of finished and semi-finished products, wherein competition is but a tale that is told.

Other industries move in the same direction, though not all have arrived at the same degree of modernity. The saw mill which produces twenty-five million feet of lumber per annum, the packing house which slaughters five thousand hogs a day, the mining operation which ships five million

tons of coal a year and the ship yard which employs a thousand hands—dominate their respective industries. The fifteen-ton coal car of the last generation has given place to the fifty-ton "hopper" and the hundred-ton "battleship," ' which is picked up bodily by powerful machinery and dumped into the hold of a lake-going freighter. The spade and the horse scraper have yielded to the steam shovel which moves five cubic yards of earth at a stroke, and the master builder who personally supervised his work is being supplanted by the construction corporation which carries on a score of jobs simultaneously, perhaps in as many different states. Everywhere the small establishment is a dwindling factor in production and everywhere hand methods are falling into desuetude. The machine technology¹¹ which more and more prevails in modern industry makes use of stupendous forces—steam, electricity, explosives, chemical reagents—forces that multiply human power a thousand fold while kept in leash, but are equally potent for destruction when out of command. These titanic agencies are turned to account by a vast aggregation of machinery which the individual workman can neither comprehend nor control, but to the movements of which his own must closely conform in rate, range and direction. Nor is the worker's danger confined to the task in which he is himself engaged nor to the appliances within his vision. A multitude of separate operations are united into one comprehensive process, the successful consummation of which requires the co-operation of thousands of operatives and of innumerable pieces of apparatus in such close interdependence that the hidden defect of a minor part or the momentary lapse of memory or of attention by a single individual may imperil the lives of hundreds. A tower man misinterprets an order and a train loaded with

human freight dashes to destruction. A coal miner tamps his "shot" with slack and a dust explosion wipes out a score of lives.

Safely to perform their work, the operatives of a modern mill, mine or railway should think consistently in those mechanical terms in which the industrial process runs. They should respond automatically to the most varied mechanical exigencies and should be as insensible to fatigue and as invariable in behavior as the machines they operate. Human nature, inherited from uncounted generations that knew not the machine, does not possess these attributes in anything like the requisite degree. The common man is neither an automaton nor an animated slide rule. His movements fall into a natural rhythm, indeed, but the beat is both less rapid and more irregular than the motions of machines, with the consequence that he fails to remove his hand before the die descends or allows himself to be struck by the traveling crane. It requires an appreciable time for the red light or the warning gong to penetrate his consciousness and his response is apt to be tardy, or in the wrong direction. Fatigue, also, overcomes him, slowing his movements, lengthening his reaction time and diminishing his muscular accuracy, thereby trebly enhancing his liability to accident.

All of which comes to saying that the human organism is imperfectly adapted to a mechanical environment. The requisite adjustment is not likely soon to be attained, because the mechanization of industry proceeds faster than the processes of habituation. The difficulty is aggravated by the ever-widening extension of machine methods to new fields of production and by the continued influx of women, children and untrained peasants into mechanical employments. From these causes spring the large number of

accidents due to the "negligence" of the workman—due, that is to say, to the shortcomings of human nature as measured by the requirements of the mechanician. Hence, also, work accidents on a tremendous scale are a permanent feature of modern life.

Broadly considered, the injuries which so arise in the course of employment are nobody's "fault," in a personal sense—workmen do not intend suicide nor do employers desire the death or maiming of employees. Every accident, it is true, may be ultimately traceable to some act or omission, some want of foresight or insight, some failure of attention, skill or care on the part of some human agent. But this is only to say that to omniscience the unexpected does not occur. Humanly speaking—as all intensive studies of mass statistics go to show—work injuries, in the main, are attributable to inherent hazards of industry. So, in iron and steel manufacturing, traveling cranes produce 17 per cent of the fatal and permanent injuries, cars and locomotives 12 per cent, working machines 22 per cent, molten metal and open flames 8 per cent, falls of persons 11 per cent, and the handling of heavy objects 8 per cent—a total of 78 per cent from six highly characteristic causes. In bituminous coal mining, falls of roof and coal account for one-half of all fatal and permanent injuries, mine haulage for one-fourth, explosives, mine gas and electricity for one-eighth. In the building trades the two outstanding causes, falls of persons and falling objects, produce one-half of the total accident loss.¹² The list might be extended indefinitely to the same effect. Everywhere the great bulk of work injuries arise from hazards which are characteristic of the industry. So much is this the case that each industrial employment comes to have a predictable total hazard: of a thousand men who erect structural steel a certain number will fall

to death, and of a thousand girls who feed metal strips into stamping presses a certain number will have their fingers crushed. By the same token, every consumable commodity may be said to have a definite cost in human suffering—a life for so many tons of coal, a mangled hand for so many laundered shirts.

This persistence of work accidents squarely raises the question as to who shall bear the pecuniary cost thereof. The specifically human cost can in no wise be shared or shifted. For the missing limb, for the pain of wounds, for widowhood and orphanage, there can be no talk of reparation.¹³ The case is otherwise with economic costs. The wage loss entailed by death or disability, the expense of burying the dead, caring for the wounded and re-training the crippled—these costs can be distributed in any manner that the community may deem just and expedient. The burden may be left to lie where it falls, upon the individual victim and his family, it may be assessed upon wage earners as a class, by means of compulsory accident insurance, or it may be distributed over society at large. Each of these solutions has its advocates, each has been put in practice to a greater or less extent and each is consonant with one or another view of social relationships. From the modern democratic standpoint the test is one of minimum social cost: that distribution of unavoidable losses is to be preferred which imposes the least hardship upon individuals and results in the smallest diminution of the community's economic assets.

In approaching this problem it is necessary to bear in mind that industrial injuries chiefly fall to the lot of wage workers, who are dependent upon their daily earnings for their daily bread, who have no savings to speak of, and whose incomes are too narrow to afford any adequate mar-

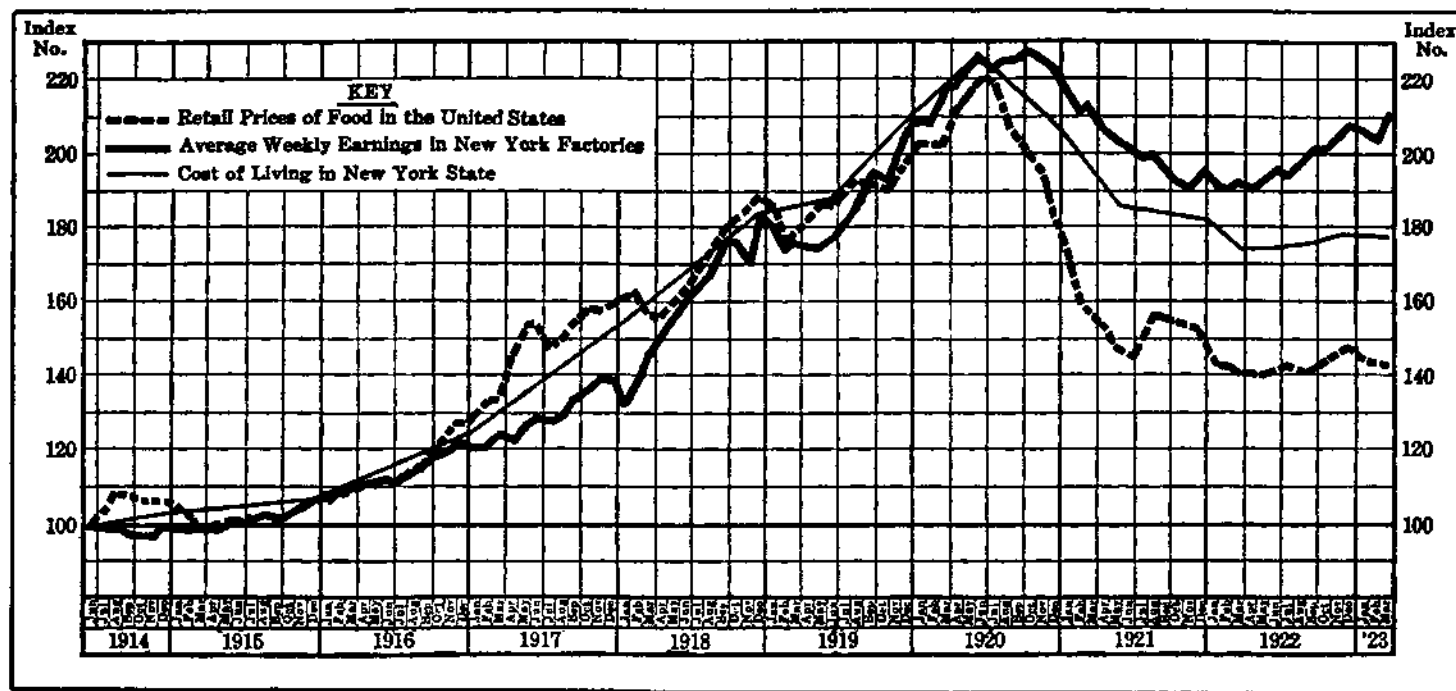


FIG. II

COMPARISON OF COURSE OF AVERAGE WEEKLY EARNINGS IN NEW YORK STATE FACTORIES WITH COST OF LIVING IN NEW YORK STATE *

*The cost of living index charted for New York State represents the combined figures for New York City and Buffalo, with an assumed increase of 3 per cent from June, 1914, to December, 1914, which is based on the increase for the United States. From the Industrial Bulletin, Albany, N. Y., April, 1923.

gin for insurance.¹⁴ Wages, indeed, have risen in consequence of the price inflation of the war period, but the wage earner's position has not thereby much improved (see graph). Competent investigators in many cities have estimated that a minimum income of \$1,500 to \$2,000 is necessary, at present price levels, to maintain an American standard of living for a family of five persons.¹⁵ Wage statistics are to be read in the light of these estimates. New York state is well above the general level of the Union as to both wages and prices, yet the average weekly earnings of New York factory workers in 1920, even without deduction for periods of disability and unemployment, were little more than twenty-five dollars.¹⁶ In the first half of 1919, two hundred and sixty-two thousand men employed in manufacturing establishments throughout the United States averaged nearly \$25.50 a week, and eighty-five thousand women averaged about \$13.50.¹⁷ In the great cotton goods industry, in 1918, more than one-fourth of all employees received less than \$10 and barely one-seventh received more than \$20 weekly.¹⁸ The average weekly earnings of 1,246 women and girls in the candy making trade in Philadelphia, in 1919, were \$10.30; only 262 received as much as \$12 a week, and only 9 (all forewomen) were above the subsistence minimum for a self-supporting, unmarried woman.¹⁹ Even bituminous coal miners, just prior to the strike of 1919, were earning, upon an average, something less than one hundred dollars monthly.²⁰ Railroad workers fared somewhat better, showing an aggregate monthly average of one hundred and nineteen dollars in 1919; yet 40 per cent of the whole number were paid less than one hundred dollars a month and only 5 per cent exceeded two hundred dollars.²¹ These instances are typical of industry at large. Of seventy-five thousand wage workers who suffered com-

pensable injuries in Pennsylvania during 1919, only 24 per cent were earning as much as thirty dollars per week at the time of injury, whereas 30 per cent fell below one thousand dollars per annum.²² A relatively small number of highly skilled workers in highly unionized trades stand well above the average, though even in these trades high daily rates are too commonly offset by a short working year. In point of annual earnings, which is the true measure of economic well-being, a very small percentage of wage workers range above twelve hundred dollars and a still smaller proportion of working class families receive as much as two thousand dollars yearly from all sources.

It needs no argument to show that families in receipt of incomes such as these can have neither property, savings nor insurance of substantial amount. A vast number do contrive to carry burial insurance—miscalled "industrial insurance"—for which they pay premiums out of all proportion to the benefits. The average value of some thirty-seven million such "industrial" policies in force at the end of 1918 was \$145 and the average annual cost was about \$4.45.²³ Many of the better paid workmen also carry "fraternal" life insurance, in amounts ranging from one hundred to one thousand dollars—enough to prevent immediate destitution, but utterly inadequate as a permanent provision for a family which has lost its chief breadwinner.²⁴ About one in four of the wage working population, lastly, have some insurance against accident or disease, though usually of very trifling amount. In a widely distributed and representative group of ten thousand families recently studied by the United States Department of Labor, the average annual premium paid *per family* for "accident and health" insurance was \$2.74, and the average annual benefits therefrom approximated one dol-

lar. In these same families the average medical cost of sickness alone, exclusive of free dispensary or hospital treatment and over and above wage loss on account of illness, was some fifty times the amount of "sick and accident" benefits.²⁵ These figures speak for themselves. The typical wage earner neither does nor can provide, out of his own earnings, against the contingencies of accident, sickness, unemployment, or old age.

The ugly fact is that American wage workers, with few exceptions, are always near the poverty line. To a man so situated, even if no one but himself is dependent upon his earnings, the loss of a few weeks' wages means privation, and permanent incapacity means beggary. But the wage worker without dependents is quite exceptional. Three-fifths of the victims of work accidents are heads of families and one-third of the remainder contribute to the support of others. Of 2,608 wage earners killed on the job in Pennsylvania, 1,588 left 4,723 dependents of whom 3,198 were children under the age of sixteen; 303 were contributing to the support of parents or of younger brothers and sisters, and only 718, or 28 per cent of the total, were without known economic responsibilities.²⁶ In the great majority of instances, therefore, a serious work accident deprives a necessitous family of its sole or chief support. The immediate result, in the absence of systematic accident relief, is poverty and the long train of evils that flow from poverty. When a skilled craftsman is killed or injured in the course of duty, the children are taken out of school, the family removes to less comfortable quarters in a more undesirable neighborhood, the mother takes in boarders or goes out to work, the boys sink to the rank of the unskilled and the girls marry beneath the economic class in which they were born. When a similar calamity befalls a common laborer,

the widow and the older children eke out such scanty earnings as they can at casual labor or in the sweated trades; if the family are numerous or the children young, the hopeless struggle too often ends in pauperism.²⁷

If such hardships were unavoidable, or if there were any prospect of social gain therefrom, the situation might be tolerated. But the hardship is totally needless and the resultant lowering of the standard of life is a clear social loss. The very burden which falls with crushing weight upon the individual workman and his family can be so distributed over the community as to be scarcely perceptible in the retail price of any commodity. Two per cent of wages would cover the full accident cost of manufacturing industry as a whole and two per cent of wages are much less than one per cent of manufacturers' price.²⁸ 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 the cost of 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.

In these facts lie the need and the justification of the compensation system. Since disabling injuries by accident and disease are inevitable concomitants of that mechanical industry which has made modern civilization possible, and the products of which are enjoyed in fullest measure by the classes least exposed to its hazards, since the victims of these injuries are precisely those least able to bear the burden of economic loss themselves or to shift it to others, since the resultant evils of poverty affect not alone the families immediately concerned but the State as well, and since the whole pecuniary cost of work injuries can be so distributed as to be little felt by anyone, public opinion has

almost everywhere come to hold that those who are crippled in the production of the community's wealth, and the dependents of those who are killed, have a right to indemnity from the public for whom they wrought. This principle has been indorsed both by organized labor and organized capital, by the American Federation of Labor and the National Association of Manufacturers, by the Railway Brotherhoods, the Steel Corporation and the International Harvester Company. It forms the basis of legislation in twenty-six foreign countries and in forty-two of the United States, and has been recommended for adoption by every investigative commission that has thus far reported in this country or abroad. So generally, indeed, has the principle of workmen's compensation been accepted by students of political science, by jurists, statesmen and the public, that "to assert to the contrary is to turn the face against the enlightened opinion of mankind."²⁹

The principle of compensation is most conveniently and effectually applied by treating the economic cost of industrial injuries as a direct expense of production, in the same category with wages, machinery and materials. The employer, in our entrepreneur system of industrial management, is the keeper of the purse; it is his function to assemble the instrumentalities of production and to cover the expenses thereof into the price of the product. If, then, the employer is held legally responsible for death or disability in the course of employment, he will protect himself by insurance against unusual loss and will incorporate the prevalent cost of industrial injuries in the price of vended goods and services. This method secures the widest, the least burdensome, and perhaps on the whole the most equitable distribution of the cost of industrial accidents and disease. It is what is meant by the principle sometimes

formulated into statute law, that each industry shall bear the cost of personal injuries actually arising therein. In the last analysis it comes to saying that the consumers of any given commodity shall make good the wage loss incurred, as well as the wages expended, in the course of production.³⁰

NOTES

¹By the term "industrial injury" is here meant a personal injury by accident or disease to a wage earner in the course of his employment.

²There are no statistics of work injuries, or even of work accidents for the whole United States. Six states have no compensation laws and no records of industrial injuries; many even of the compensation states make no attempt to compile or publish statistics. About twenty compensation boards issue annual or biennial reports which contain the number of injuries compensated in their respective jurisdictions. But of these reports some are for calendar, others for fiscal years; some include and others exclude occupational disease, some exclude establishments which employ fewer than four, six or ten persons; some purport to give all reportable injuries, others omit disabilities of less than one week, ten days or two weeks. The classification of injuries in respect to severity is equally diverse. Any attempt at combination or comparison of the published statistics is well-nigh hopeless.

Of the six largest industrial commonwealths, Missouri has no record of industrial injuries, Michigan and Ohio have published nothing later than 1919, Illinois nothing later than 1920, and the Industrial Commission of New York has published no accident statistics for a number of years.

The estimate in the text is based upon the published reports of compensable injuries in California, Massachusetts, Oregon, Pennsylvania, Washington and Wisconsin for the year 1920. These states comprise twenty per cent of the population of the Union and their industries are fairly representative. The official reports for these states give 4,200 fatal accidents, 5,600 serious permanent disabilities and 246,000 temporary disabilities of more than seven days' duration as either occurring or settled in the calendar year 1920 or the fiscal year 1919-1920. But this record excludes agriculture and domestic service, maritime employments, railway employees in interstate commerce and employees of the United States government. Wisconsin, moreover, excludes small establishments and Oregon, Washington and Pennsylvania exclude occupational disease. The very incomplete reports of the Interstate Commerce Commission give 1,354 fatal accidents to railway trainmen in 1920 and there were 475 fatalities among federal employees. There are no accident statistics for agriculture, domestic service or maritime employments.

Conjectural statistics are as little to be trusted as conjectural history, but the fragmentary records above cited will indicate that the estimate made in

the text is rather below than above the true number and cost of industrial injuries in the United States.

³ Of 8,550 persons fatally or permanently injured in Pennsylvania compensation insurance experience, 1916-1919, 10 per cent were under twenty-one, 50 per cent were between twenty-one and forty, 20 per cent were between forty and fifty and only 6.5 per cent were over sixty.—*Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1920.*

⁴ *Report of the Statistical Committee of the International Association of Industrial Accident Boards and Commissions, Bulletin of the U. S. Bureau of Labor Statistics, No. 276.*

⁵ *Monthly Labor Review, U. S. Dept. of Labor, Oct., 1919, pp. 222-232.*

⁶ *Monthly Labor Review, U. S. Dept. of Labor, Dec, 1919, pp. 299-302.*

⁷ *Bituminous Coal Mine Fatalities in Pennsylvania*, compiled by the Pennsylvania Insurance Department, July, 1919.

⁸ See the very instructive graph in *The Wisconsin Safety Review* for August-October, 1921.

⁹ *United States Census of 1880, Manufactures.*

¹⁰ Two-thirds of the iron and steel workers in 1919 were in establishments which employed more than 1,000 persons, and four-fifths were in establishments employing at least 500. The relative growth of large establishments in the single decade, 1909-1919, is especially striking.

¹¹ The writer's obligation to Thorstein Veblen in this and the succeeding paragraph will be obvious to all readers of *The Theory of Business Enterprise.*

¹² The foregoing illustrations are all taken from the *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1918*, issued by the Pennsylvania Compensation Rating and Inspection Bureau.

¹³ Cf. Hard, *Injured in the Course of Duty*, pp. 38-40.

¹⁴ According to the Federal Income Tax returns, rather less than 10 per cent of the persons engaged in gainful occupations have total incomes of more than one thousand dollars per annum and only 5 per cent are above the two thousand dollar income level. Personal earnings constitute 90 to 95 per cent of all incomes up to two thousand dollars, whereas such earnings are only 48 per cent of incomes between two thousand and five thousand dollars and are an insignificant fraction of the higher incomes. The number of wage workers whose incomes exceed two thousand dollars per annum is wholly negligible. It follows that income from property, savings and insurance forms no appreciable part of wage earners' budgets. As to property, even in "home owning Pennsylvania," only 36 per cent of the urban population owned their homes in 1910 (only 22 per cent were mortgage free). Probably a minority of these home owners were wage workers.

See *Statistics of Income*, U. S. Commissioner of Internal Revenue, 1919; U. S. Census, 1910, Vol. 1, pp. 1300-1307; Friday, *The Taxable Income of the United States*, in *The Journal of Political Economy*, Dec, 1918, p. 952, and *Statistics of Income*, in *American Economic Review*, Sept., 1919, p. 502; Mitchell, *Income in the United States.*

¹⁵ On the cost of maintaining the minimum standard of comfort and decency at the close of the World War, see *Monthly Labor Review*, U. S.

Dept. of Labor, Dec, 1919, also July, Sept. and Oct., 1919; *Standards of Child Welfare*, U. S. Dept. of Labor, Children's Bureau, Publication No. 60; *Literary Digest*, Sept. 14, 1918, p. 16; Byer, *Workingmen's Standard of Living*.

¹⁶ *The Labor Market in New York*, January, 1920, issued by the Industrial Commission of New York.

¹⁷ *Monthly Labor Review*, U. S. Dept. of Labor, Sept., 1919, pp. 176-189.

¹⁸ *Bulletin No. 262*, U. S. Dept. of Labor, Tables D and H.

¹⁹ *Bulletin No. 4*, Women in Industry Service, U. S. Dept. of Labor, June, 1919.

²⁰ *Monthly Labor Review*, U. S. Dept. of Labor, Dec, 1919, pp. 207-229.

²¹ *Monthly Labor Review*, U. S. Dept. of Labor, Dec, 1919, pp. 229-236.

²² *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania*, 1916-1920, Table XV. This analysis covers insured workmen only but the wage levels are much the same in insured and uninsured establishments.

²³ See *New York Insurance Department Report*, 1919, Part II, under the *John Hancock*, *Metropolitan* and *Prudential* Life Insurance Companies.

A very large proportion of these burial policies are on the lives of young children—evidence at once of the poverty of the parents and of the high infant mortality. "Industrial" insurance is especially popular among negroes and recent immigrants. It is a singular fact that American legislators, who have been so careful to safeguard "ordinary" life insurance policies, held in the main by professional and business men, have done so little to protect "industrial" policyholders against chicanery and fraud. Most "industrial" policies have no "paid-up" or "cash surrender" value before the tenth year and no non-forfeiture clause. The number of such insurances terminated by lapse of premium, with forfeiture of the amount already paid, is three times the number terminated by death or maturity.

In this connection it is worth noting that "industrial accident and health" policies very commonly exclude all accidents in the course of employment, many non-occupational accidents and a great part of the common diseases. Such exclusions are printed in small type and in highly technical language, so as to elude observation or understanding.

²⁴ The average amount of 2,643,000 fraternal certificates reported to the Insurance Department of Pennsylvania as in force at the end of 1918 was \$1,025. It is well known, however, that a considerable proportion of the aggregate "fraternal" insurance is carried by small business and professional men and that the average amounts held by wage workers are considerably below the general average per policy.

²⁵ *Monthly Labor Review*, U. S. Dept. of Labor, May, June, July, and Dec, 1919.

The study covered ninety-two communities in forty-two states. The families studied were those of wage earners or salaried workers comprising husband, wife and at least one child. Slum families and non-English speaking families, who had been in the United States less than five years, were excluded. These exclusions obviously raise the average. The modal income of these ten thousand working class families was \$1,350 per annum; the earnings

of the husband, upon an average, constituted almost 90 per cent, and income from all sources other than wages about 4 per cent, of total income.

²⁶ *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1918, Table VII.*

²⁷ The above generalizations rest upon a mass of recorded experience from the days of employers' liability. See *The Pittsburgh Survey, Charities and the Commons*, Vol. 21, p. 517; Eastman, *Work Accidents and the Law*; Downey, *Work Accident Indemnity*, pp. 73-78; and, especially, the *Reports of the Employers' Liability Commissions of Illinois (1910), New York (1910), Ohio (1911) and Michigan (1911).*

²⁸ Wages in the different industries range from 2 per cent to 50 per cent of factory costs.—See *U. S. Census of 1920, Manufactures.*

²⁹ Mr. Justice Fullerton in *State ex rel. Davis-Smith vs. Clausen*, 117 Pacific, 1101-1114 (Washington, 1911).

For the well-nigh universal acceptance of the compensation principle see *Hearings before the U. S. Employers' Liability and Workmen's Compensation Commission, Senate Document No. 90, Vol. 1, Part I I I, Sixty-second Congress, First Session.*

³⁰ That the cost of compulsory compensation for work injuries will fall mainly upon consumers appears to be broadly true, though the assumption to that effect will not hold universally nor without qualification. The compulsory insurance of employees by their employers is in the nature of a producer's tax and its effect is to enhance the cost of production by the amount of the insurance premium. Mr. H. Gunnison Brown has recently argued, *per contra*, that the whole cost of compulsory workingmen's insurance necessarily falls upon wages.—"The Incidence of Compulsory Workingmen's Insurance" in *The Journal of Political Economy*, Feb., 1922—Mr. Brown's argument proceeds upon the marginal productivity theory and is doubtless convincing to marginal utilitarians, although a different conclusion might be reached by an equally logical deduction from the same premises. But it is not worth while to traverse this line of reasoning: marginal productivity dialectics is as idle for any problem of market price as Christian Science or the speculations of Duns Scotus.

No one—except he be a cloister economist—can say of any particular item of producer's cost that it infallibly enters into the price of the product. Wages, materials, machinery, rents, interest, freights and advertising are each vastly more important items of entrepreneur's cost than any conceivable premiums for compensation insurance and all are extremely variable. Competing enterprises rarely have the same aggregate cost per unit of product and this aggregate is never made up, in any two instances, of the same components in the same proportions. High costs of one sort are frequently offset by low costs in another direction or by superior quality, advantage of location, and the like. Variable costs not so offset are sometimes absorbed in the price of the product and sometimes taken out of profit, according to the state of the market and the degree of competition or monopoly among producers. So much is commonplace to everyone who is at all acquainted with any branch of business enterprise. But it is also commonplace, and

indeed notorious, that producers' costs do, upon the whole, get into the price of products.

Compensation insurance premiums are no exception to the rule. They are indubitably an item of entrepreneur's cost and as such will be incorporated, so far as the state of the market permits, in the price of vended goods and services. Where, as in coal mining or building construction, such premiums are an appreciable cost item, the maximum premium rate is, in fact, added to the book cost and the contract price and any saving therefrom is covered into profits. Any coal operator or building contractor could enlighten Mr. Brown upon this head. Under given competitive conditions, workingmen's insurance, like any other cost, may come out of profits, but that is not the usual result. That workingmen's insurance can never depress wages would be a rash assertion, but there is no evidence that it has ever done so. Certainly wages are not lower in New York than in Connecticut, New Jersey or Pennsylvania, notwithstanding the difference of more than one hundred per cent in compensation insurance rates.

The question is not, after all, of great importance. The object of workmen's compensation is to *distribute* the cost of work injuries. Whether the burden falls in the last analysis upon consumers or upon wage earners *qua* wage earners, or comes out of profits, interest and rent, is a minor matter. So far as the cost falls upon consumers, wage earners must bear a substantial share—they are themselves no inconsiderable fraction of the consuming public. The essential social interests are sufficiently secured by any wide distribution which prevents serious hardship to individuals, whether employers or employed. But that compensation cost is more likely to be added to the selling price than deducted from wages accords both with common sense and with known business practice.

CHAPTER II

THE SCOPE OF WORKMEN'S COMPENSATION

The economic theory which underlies Workmen's Compensation is that frequently spoken of as the doctrine of occupational risk: the principle, namely, that the risk of economic loss through personal injury in the course of production should be borne by the industry itself.¹ This principle is evidently applicable to all personal disablements, whether by accident or disease, which are incident to the production of economic goods or services. The loss of earnings which results from such disablements is indubitably a cost of production, by whomsoever borne; that this cost, like others, should be incorporated in the price of the product is in strict accord with the current price system and with modern notions of social justice. It follows that the compensation system should comprise all industries, all persons employed therein and all personal injuries which arise in the course of industrial pursuits.

I

The acceptance of the principle of occupational risk carries with it the inclusion of every species of industrial employment. Some occupations are less hazardous than others, but that injuries are few is no mitigation of hardship to those who are injured. A low degree of hazard implies a correspondingly low cost of compensation,² so that the exclusion of the so-called non-hazardous employments works occasional hardship and raises needless administrative difficulties³ for no off-setting gain.

The exclusion of particular industries or occupations from the compensation system is not uncommon, but such exclusions rest upon no consistent principle, such as degree of hazard, frequency of injury or economic need. The very laws which cover clerical office employees, hand cigar makers and watch manufacturers exclude such hazardous employments as agriculture, coal mining and cotton ginning. Agriculture and domestic service, in particular, are almost universally excluded from the American compensation system, either expressly or by the oblique device of exempting small employers generally. The ostensible ground for such exclusion is the administrative difficulty of applying a Compensation Act to a multitude of farmers and householders, many of whom are but occasional employers.⁴ The real, though unavowed, motive is doubtless the political impossibility of passing a law which would be felt as a hardship by so large a fraction of the voting population. As a matter of political expediency, in the actually existing state of public opinion, the exemption of agricultural and domestic employers is probably inevitable, though such exemption is not to be justified on equitable grounds. The farm hand who loses his arm in a corn shredder, the domestic laundress who breaks her leg on the basement stairs, the country blacksmith's helper who is permanently disabled by a kicking horse—have the same ethical claim to compensation that any other class of employees has. The administrative difficulties in the way of covering petty employers are real, but may readily be overcome by an appropriate insurance organization. Nevertheless, where the choice must be made, it is far better to omit these employments from the compensation system than to lower the scale of benefits for the sake of including them.

II

The same principles which would dictate the inclusion of all employments require that all persons who are exposed to injury by reason of their daily work shall be brought within the protection of the compensation system. This principle is violated by the exclusion, so common in British and American Acts, of casual employees, home workers, salaried executives and self-employing workmen. Each of these exclusions is traceable to some confusion of thought or to some vestige of the ancient law of master and servant; not one is well founded in considerations of an economic character.

The term "casual employment," in the British Workmen's Compensation Act and in those American statutes which follow the British model, relates to the character of the work and not to the length of service: it is explained by the qualification "not in the regular course of the employer's trade or business."⁵ This limitation evidently relates back to the concept of employer's liability; its *raison d'être* at the present day is the restricted coverage too often found in compensation insurance policies. The appropriate remedy is not to deny compensation in these cases but to enforce a change in the policy contracts so as to provide indubitable insurance under all circumstances.⁶ The chief practical effect of excluding casual employees, apart from occasional instances of undeserved hardship to the victims of industrial injury, is to promote litigation and multiply technicalities. Their inclusion would add nothing appreciable to the cost of insurance for any occupation or establishment.

"Home workers" in the sweated trades are excluded upon the theory that the employer has no control over their methods of work or the premises upon which they are em-

ployed and no ready means of ascertaining whether a given injury was or was not incident to their employment. This assumed want of control is but another inheritance from the law of master and servant and, like most pronouncements from the same source, is patently contrary to fact. Whether the work shall be done at home or in the factory, by hand or with machines, by night or by day, in sanitary or insanitary surroundings, is absolutely within the employer's discretion. The obligation to provide a suitable place of work is fundamental to the modern concept of employer's responsibility; the garret master, by evading this obligation, ought not to escape his responsibility for injuries arising out of the business as he has chosen to conduct it.

Executive officers of a corporation stand in somewhat different case. They are ordinarily highly paid, are exposed to little risk of injury in the performance of their duties and are presumptively able to insure themselves against accidental death or disability.⁷ Yet the additional cost of including even executive officers in the compensation system is practically *nil* and the ground on which they are excluded is the archaic distinction between masters who issue orders and servants who obey them. There is no sufficient reason in economics or equity for denying compensation to a railway president or a bank director who should chance to be injured in the discharge of his official functions.

Much more numerous and, from the present standpoint, more important is the class of indirect employees; hired, discharged and directed in their work by a contractor or sub-contractor, but performing services incidental to the business of the principal. The same considerations which require the inclusion of all direct employees in the compensation system make it imperative that the principal shall be held responsible for injuries to these indirect employees

as well. The state or municipality which builds a bridge or a highway, the owner or lessee who constructs or repairs a building, the mine operator who drives a tunnel or sinks a shaft, is always in position to insist that the contractor shall insure the employees engaged in such work; in the event of failure so to do, the principal should be held liable as if he were the direct employer. The opposite rule of law would enable an unscrupulous employer to contract out of all responsibility for work injuries.⁸

A more difficult problem is presented by self-employed workmen, including those petty employers who work alongside their men. The small building contractor, the petty tradesman, the village blacksmith, the laboring farmer, the itinerant thresherman, and the housewife who does her own work, are all exposed to much the same hazard and stand in much the same economic position as wage earners in the same employments. The method of workmen's compensation, as ordinarily understood, is not applicable to these independent workers because there is no employer to be held responsible in case of injury. But the same benefits can and should be provided for this very numerous class of self-employed workmen through low-cost, voluntary insurance, organized with a special view to convenience and flexibility.

III

An industrial injury, in a wide sense, is any damage to the bodily structure or any derangement of bodily functions, whether by accident or disease, which arises from causes connected with or incidental to industrial employment. In legal language this concept is expressed by the phrases "injury arising out of the employment," and "injury arising in the course of employment." Either form of words, if not subjected to over-metaphysical interpretation at the hands

of courts or administrators, would sufficiently serve the turn. Unfortunately the British courts, followed in this respect by most American jurists, have so involved both phrases in a fog of subtle and contradictory distinctions that twenty years' litigation has done less than nothing to clarify the legal definition of an industrial injury.⁹ In the common-sense understanding of the words, an injury arises out of the employment if the proximate cause of injury is an event which occurs in the course of employment and is not purely personal to the injured workman.¹⁰ In common language, again, a workman is in the course of employment wherever and whenever his presence is required by the nature of his work, even though at the moment of injury he may be on his way from the plant entrance to his allotted post of duty, waiting for materials, appliances or instructions, eating his lunch, resting, or attending to a want of nature.¹¹ For all these are ordinary incidents of the day's work, necessary to be performed, in order that the work itself may go forward. So a miner is in the course of his employment from the moment when he gets aboard the work train on his way to the mine until he quits the employer's conveyance on his homeward journey; a steel worker begins his employment when he enters the mill gates and quits it when he leaves the same; and a salesman who travels directly from his house without reporting to an office is in the course of his employment from the moment of leaving home.¹² So much should be made clear by legislators in language intelligible to lay and learned alike.

There is, however, a class of injuries which may fairly be said to arise out of the employment, though not in the course of it, as ordinarily understood; injuries, namely, which occur in going to or from the place of work. A worker *who is struck by an automobile or run over by a railway*

train between his home and the scene of his daily toil suffers an injury which is clearly attributable to his employment. He does not live in the factory or mine and his going and coming are as necessary to the furtherance of the employer's business as any other incident of the day's routine. The objection to including these injuries is purely administrative; it is a fair question whether the uncertainty and litigation thereby imported into the Compensation system would not more than offset the resultant advantages. The line of demarcation between industrial and non-industrial injuries ought to be clear-cut and consonant with ordinary industrial practice. The place of work probably best satisfies these tests. "The place of work," however, should be broadly defined so as to cover the entire premises upon which the employer's business is conducted, including the means of ingress and egress,¹³ the vehicles or apparatus used by the employer to transport goods or persons away from the premises, and any place where the employee's presence is required by the performance of his duties.

Industrial injuries, however distinguished from non-industrial, are commonly differentiated into "injuries by accident" and "injuries by disease." An accident, in this connection, is defined as a sudden and fortuitous occurrence which results in violent injury to the bodily structure, whereas disease is held to be a physiological derangement, not attributable to the sudden application of external violence.¹⁴ This distinction doubtless has its uses from a therapeutic standpoint but it is not valid as a basis of discrimination between compensable and non-compensable injuries. Accident and disease merge into one another by insensible gradations and the effect of the one frequently depends upon the concurrence of the other. The degree of incapacity produced by a fracture is increased by a tuber-

cular condition of the bones and pneumonia may come in to aggravate an accidental injury to the lungs. Infection is clearly a disease, yet no one would deny that the loss of a hand from infection of a scratch upon the little finger is compensable under an act which covers only "injury by accident." The same language, broadly construed, will cover anthrax infection from skins handled at a tannery, even though the portal of infection may have been a cut received in shaving.¹⁵ The one case is brought within the law because the initial injury occurred in the course of employment, notwithstanding that the infection may have been of non-industrial origin; in the other case the causal connection of employment and injury is even more direct, because anthrax is a specific hazard of the tanning industry. Lead poisoning, again, is as clearly an accident, in the sense of being undesigned, as poisoning by carbon monoxide or suffocation by "black damp" in a coal mine. In short, the whole basis of the distinction between accident and disease, from a compensation standpoint, is at once artificial and irrelevant. The doctrine of occupational risk applies as fully to occupational disease as to occupational accidents; industry is as clearly responsible for the insidious hazards of chemical poisoning and bacterial infection as for the more obvious perils of working machines and falling objects.

The objections to compensating occupational disease are purely practical. Most diseases are of gradual development, insomuch that it is often difficult, if not impossible, to establish a causal connection between the disability and employment in a particular establishment. Many of the most destructive diseases, again—tuberculosis, typhoid, Blight's disease, influenza—are more often than not of non-occupational origin. From these premises three deductions are drawn: that the adjudication of claims for occupational

disease would be extremely burdensome, that the last employer could not equitably be held to pay for the terminal results of a disease perhaps contracted long before and in a different establishment, and that, on account of such increased liability, workmen who manifested symptoms of occupational disease would be debarred from employment.¹⁶

The weightiest of these objections derive their force from the practice of self-insurance. To an employer who carries his own risk, responsibility for the terminal effects of disease may be esteemed a hardship and it may seem worth while to discriminate against workmen who are suffering from previously contracted ailments; an insured employer feels no such hardship and has no incentive to such discrimination. The same arguments, so far as they hold at all, apply with equal force to many injuries by accident. The loss of a second eye constitutes permanent total disability,¹⁷ an electric shock which would cause only temporary inconvenience to a man in vigorous health may result fatally if the victim's heart be weak, and a sudden strain may produce a disabling hernia only because of predisposing weakness of the abdominal wall.¹⁸ In none of these cases is the claimant required to show that the whole extent of the disability was attributable to the particular occurrence upon which his claim is founded; it is enough that the injury so received, taken in conjunction with pre-existing conditions, actually disabled the workman from labor which he was theretofore able to perform.¹⁹ To accidental injuries of this class, the aggravation of previously contracted lead poisoning or of stone cutter's phthisis is strictly analogous. In all these cases, as a matter of administrative convenience, the last employer is held responsible for the cumulative result. But the last employer is not thereby inconvenienced

unless he has elected to carry his own risk. In so far as employers are insured the cost of cumulative injuries is distributed over industry at large and the ascription of the death or disability to this or that establishment is immaterial. Non-insured employers have, by their own election, deprived themselves of this cost distribution and they cannot reasonably complain of any hardship which results therefrom.

The objections raised on mere administrative grounds are not of serious moment. To establish the occupational origin of disease may be more difficult than to ascertain whether an accident occurred in the course of employment, but the task is not beyond the competence of any reasonably efficient administrative board. The number of such cases to be adjudicated, even under the most liberal of laws, will bear but a small proportion to the number of accidental injuries;²⁰ a thorough investigation of each claim could entail no excessive burden.

Occupational diseases should be covered, not by way of enumeration, but under the simple description of "a personal injury arising in the course of employment." The attempt to single out specific diseases as incident to specified employments²¹ is needlessly restrictive. Not only do recognized industrial poisons crop up in unexpected occupations, but the list of diseases which have been clearly traced to definite occupational hazards is continually growing. Many ordinary infectious diseases, moreover, may, under special circumstances, have an occupational origin. Malaria, pneumonia, tuberculosis, or even influenza, may be actually contracted in the course of employment and when so contracted should be compensable.

To return to the point of departure, the compensation system should be co-extensive with the exposure to indus-

trial injury. Compulsory compensation should cover all employments, all employers, all employees, and all injuries, whether by accident or disease, which arise in the course of employment. The compulsory system should be supplemented by effective voluntary insurance for self-employed workmen.

NOTES

¹ Compare Downey, *History of Work Accident Indemnity*, p. 92; Frankel and Dawson's, *Workingmen's Insurance in Europe*, p. 9; Rubinow, *Social Insurance*, Ch. I. The principle has repeatedly been stated with approval by courts of last resort: *Borgnis vs. Falk Co.* (1911), 147 Wis. 327; *Northern Pacific Railway Co. vs. Meese* (1916), 239 U. S. 614; *N. Y. C. R. R. Co. vs. White* (1917), 243 U. S. 188; *Mountain Timber Co. vs. State of Washington* (1917), 243 U. S. 219; *Middleton vs. Texas Power and Light Co.* (1919), 249 U. S. 152.

The doctrine of occupational risk is, of course, susceptible of much wider application; all social insurance rests essentially upon the same principle. The statement in the text covers only that aspect of occupational risk with which the present treatise is concerned. For a concise statement of the same doctrine in its broader aspects see Meeker, "Industrial Hazards" in *Monthly Labor Review* of the U. S. Dept. of Labor, Sept., 1919, pp. 1-8.

² For clerical and professional employments, *e. g.*, the insurance cost under a system of full compensation would be about \$.10 per \$100 of payroll, or \$10 a year on a \$10,000 salary.

³ Excluded employments are in fact so intermingled with included employments as to call for endless hair-splitting distinctions and raise the question of inclusion or exclusion in countless cases. Clerical employees, *e. g.*, are found in every industry. Even farm labor is often incident to mining or quarrying operations, dairying, chocolate manufacturing, hotel operation, etc.

⁴ It is sometimes added that the hazards in these occupations and establishments are exceptionally patent and of a simple character—*Cf.* *Middleton vs. Texas Power and Light Co.* (1919), 249 U. S. 152. But this is clearly a judicial afterthought, by way of justifying a predetermined conclusion.

⁵ See Butterworth's *Workmen's Compensation Cases*, index; *Hill vs. Begg* (1908), 24 T. L. R. 711; *Johnston vs. Monasterevan General Store Co.*, 42 Ir. L. T. R. 268. American decisions are to the same effect—*Marsh vs. Groner* (1916), 258 Pa. 473.

Thus a stevedore is not a casual employee, though he works but for an hour, and a laundress who comes each Monday is employed in the regular course of her employer's business as a housekeeper. But a window-cleaner who occasionally works at the home of a physician is not employed in the course of the latter's business.

•The Pennsylvania Standard Workmen's Compensation Endorsement,

e. g., covers not only the business described in the Declarations, but **any** other undertaking in which the employer may engage during the term of insurance, whether or not disclosed in advance to the insurer.

⁷ Yet the average monthly compensation of 7,432 "general officers" of American railways in July, 1919, was but \$360.—*Monthly Labor Review*, U. S. Dept. of Labor, Dec, 1919, p. 235. How many of these would be ranked as "executives" not within the scope of a compensation act which applies only to "employees" is uncertain.

⁸ Most compensation acts have clauses against "contracting out," but these provisions do not, in general, apply to the employees of an independent contractor unless the work contracted for is a part of the principal's ordinary business or undertaking. The erection of an office building at a factory, e. g., would not ordinarily come within the scope of the contractor's clause. A multitude of hair-splitting distinctions has grown out of the attempt to define "an independent contractor." See index to Butterworth's, *Workmen's Compensation Cases*, and Bradbury, *Workmen's Compensation*.

⁹ See the very illuminating articles by Francis H. Bohlen in *Harvard Law Review*, Feb., March and April, 1912.

¹⁰ So, e. g., death by lightning or by heat stroke, or disablement by frost bite, in the course of employment is clearly an industrial injury in any common-sense meaning of that term. But the British (and American) courts have commonly held that such injuries do not arise out of the employment unless the nature of the work involves exceptional exposure to these dangers. So in *Kelly vs. Kerry County Council* (1908), 42 Ir. L. T. 23, it was held that there was no evidence that a road laborer, killed by lightning while cleaning out gutters, was exposed to greater danger than any other person within the area of the storm. And in *Karemaker vs. S. S. Corsican* (4 Butterworth, 295) it was held that the risk of frost bite was not incidental to the work of a sailor while pulling upon icy ropes at Halifax—frost bite being common in that climate and the risk thereof common to all persons whose business or pleasure takes them out of doors in winter. *Per contra* sunstroke was held to be a risk arising out of the employment of painting a ship in a tropic climate (*Morgan vs. S. S. Zenaida* (1909), 25 L. T. R.) and heat stroke was held to be a hazard incident to baking (*Ismay, Imrie & Co. vs. Williamson* (1908), 42 Tr. L. T. 213). And in *Andrew vs. Failsworth Industrial Society* (1904), 2 K. B. 32, it was held that a workman upon a scaffold ten feet from the ground was peculiarly exposed to lightning.

The decisions are in hopeless conflict because grounded upon metaphysical distinctions which have no real relation to the objective facts of industry.

¹¹ "In the course of employment" is generally construed in the sense indicated in the text. *McKee vs. Great Northern Railway* (1908), Ir. L. T. 132 (leaving work by an unusual exit, but still upon the employees premises); *Cremins vs. Guest, Keen and Nettleford* (1907), 24 T. L. R. 189 (returning from work upon the employer's work train); *Rowland vs. Wright* (1908), 24 T. L. R. 852 (injury during lunch hour); *Dzikowski vs. Superior Steel Co.* (1917), 259 Penna. 578 (set fire to oil-soaked **clothing** while **smoking during** a temporary intermission of work).

But there are many conflicting decisions upon the question whether an employee, by disobedience of orders, going into a forbidden place, or undertaking, without express direction, work not in the scope of his usual duties, takes himself out of his employment. *Cf. Gurski vs. Susquehanna Coal Co.* (1918), 262 Penna. 1 (miner suffocated in part of mine which had been fenced off and posted with danger signs and which he had been expressly warned not to enter; held that in entering this part of the mine to get tools left there some two months before the miner was in the course of his employment); *Fekete vs. Lehigh and Wilkes-Barre Coal Co.* (1918), 2 Penna. Comp. Decisions, 65 (miner returning from work upon defendants train volunteered to uncouple a car and thereby took himself out of the course of his employment).

See also Bohlen, *u. s.*, and Butterworth, index.

¹² *Cf. Haddock vs. Edgewater Steel Co.* (1918), 2 Penna. Comp. Decisions, 41.

¹³ Means of access across railway tracks which are adjacent to the place of work, though not upon the employer's property, ought in all equity to be considered as a part of the employer's premises. Coal miners and steel workers, *e. g.*, are very often obliged to cross railway tracks at grade upon entering or leaving their place of work; while so doing, by the ordinary rules of law, they are trespassers upon the railway, and are, at the same time, outside the scope of their employment. The case of *Deane vs. Phila. and Reading Coal and Iron Co.*, 1 Penna. Comp. Decisions, 279 (1917), is typical of many decisions; here it was held that a miner was not in the course of his employment while crossing the Phila. and Reading Railway tracks on his way home from work, though obliged to cross these tracks in order to leave the colliery. The injustice in this instance was aggravated by the identity of the Railway and Mining Companies in all but corporate name. Sound public policy requires that the employer shall be held to provide a safe place of work and safe means of access thereto.

¹⁴ *Cf. the language of the Pennsylvania Workmen's Compensation Act, 1915, Sec. 301: "The term 'personal injury' as used in this Act shall be construed to mean only violence to the physical structure of the body, and such disease or infection as naturally results therefrom." This language was very carefully chosen, in the light of British and American decisions, with the express object of excluding occupational disease. Yet death by anthrax following a slight scratch by a "sticker" on the wool which deceased was handling has been held to be within the statutory definition of accidental death—McCaughey vs. Imperial Woolen Co. (1918), 261 Penna. 312.*

¹⁵ It is usually held that anthrax infection of a non-industrial wound is not an injury by accident arising out of the employment—*Eldridge vs. Endicott, Johnson and Co.* (1916), 8 New York Dep. Rep. 445. But surely it is the origin of the disease and not of the wound through which the disease entered the system which ought to govern such cases. For an admirably reasoned decision to that effect, see *Younkin vs. Beggs and Cobbs Tanning Co.*, 4 Penna. Dept. Repts. 113 (1917).

¹⁵ A favorite argument of employing interests.

¹⁷ Many of the American laws compensate a second injury, which actually results in permanent total disability, only for the loss which would have resulted had there been no prior injury. Others, again (notably the New York and Ohio Acts) adopt a clumsy and roundabout device for distributing the cost of such injuries. The sole reason for either course is the political influence of wealthy corporations which elect to carry their own risk.

¹⁸ The law in Alabama and the administrative board in Washington have gone to great lengths to remove hernias from the category of compensable accidents. The same reasoning would require proof, in any claim for death by electricity, that the victim's heart was previously sound, and would deny compensation beyond the normal healing period in any case of fracture aggravated by the victim's age or physical condition.

¹⁹ *Gomez vs. South Eureka Mining Co.*, 1 Cal. Ind. Ace. Com. 180; *Johansen vs. Union Stock Yards Co.*, 99 Neb. 328; *Kelly vs. Watson Coal Co.*, 272 Penna. 39 (1922).

²⁰ Under the United States Employees' Compensation Act, which covers every species of industrial injury, occupational diseases accounted for only five deaths and forty-three disabilities out of a total of 573 deaths and 24,000 disabilities.—*Third Annual Report* of the United States Employees' Compensation Commission, 1919, p. 92.

²¹ Such an attempt is made, *e. g.*, in the British Workmen's Compensation Act.

CHAPTER III

THE SCALE OF COMPENSATION BENEFITS

The scale of benefits is the crux of the compensation system. Compensation is remedial rather than preventive: it aims to relieve the suffering of the injured workman, to restore his earning capacity as far as possible and to make good, to himself and to his dependents, the wage loss which results from his disability or death. Indirectly, workmen's compensation promotes industrial safety by adding a pecuniary incentive to the humanitarian interest of employers. But this preventive effect is in the nature of a by-product and depends, like the function of relief itself, upon the adequacy of benefits. A low indemnity scale offers little incentive for the removal of hazards; an adequate scale exerts effective pressure upon employers to reduce the number and severity of work injuries at the same time that it fulfills the primary objects of restoration and indemnity.

The guiding principle for the determination of compensation benefits is that of least social cost. That scale of benefits is to be preferred which most conduces to the prevention of industrial injuries, which best promotes the removal of disability when injury has occurred and which so distributes the residual economic loss as to be least felt by individuals and by the community at large. So defined, the canon of least social cost requires, on the one hand, the fullest possible medical relief and, on the other hand,, indemnity commensurate with wage loss. It is the interest of society that incapacity shall not be prolonged and that

the standard of life of the injured workman shall not be depressed or his children deprived of educational and industrial opportunities. Forasmuch as the worker contributes more than his wage to the community's wealth, any curtailment of his subsistence, training or security impairs production by more than the resultant wage loss. Full compensation pays, even on the lowest ground of sheer economy. But if life be more than meat a democratic government will be the more concerned with the comfort and security of those whose livelihood is the fruit of their daily toil. A pauper scale of benefits, designed as a substitute for poor relief or a subvention to the Associated Charities, is at once uneconomic and inhumane.

Against the plea for indemnity equivalent to wage loss there are but two arguments which, on social grounds, demand consideration. Full compensation, it is often urged, will encourage reckless exposure to injury and induce abstention from work beyond the actual duration of disability. So far as either effect is not the mere figment of interested imagination it must be allowed some weight in determining a socially desirable scale of benefits.

Less is heard now than formerly of the argument that compensation promotes carelessness. The argument, indeed, runs counter to experience and common-sense. It presupposes, either that men will deliberately mutilate themselves in order to claim indemnity, or that the prospect of indemnity induces reckless conduct. Neither supposition accords with what psychology has to teach of human behavior. Self-mutilation is restrained by instinctive impulse, more potent as it is earlier and more deeply implanted, than any pecuniary motive. Experience has accordingly shown that injuries intentionally self-inflicted are so rare as to be wholly negligible.¹ Recklessness, again,

as distinguished from deliberate exposure to injury, is a matter of temperament and habit rather than calculation. The demands of the job, the urgency of speed,² prevalent methods of work³ and the familiarity which breeds contempt of danger—it is these things, and not any calculus of gain or loss, that beget the carelessness of the structural ironworker, the coal miner and the railway brakeman.⁴ In like manner it is not by throwing upon the workman the pecuniary cost of work injuries, but by habituation to safe methods of work, through discipline and training, that careless practices are eliminated.

More weight is to be allowed the remaining argument against full compensation. Charges of malingering under existing compensation acts are, no doubt, greatly exaggerated. Extensive inquiries among administrative boards and the review of testimony in hundreds of hearings have elicited very few instances of apparent simulation. The indemnity payable in most jurisdictions bears so small a proportion to ordinary earnings that the injured worker has very little temptation to remain away from the job a day longer than necessity requires. The danger, indeed, lies quite the other way: thousands of incapacitated workmen return to their employment before their injuries are fully healed, often with disastrous results. Yet it would be unsafe to conclude, from the absence of malingering under an inadequate scale of benefits, that no risk would be incurred by full compensation. If we no longer conceive man as a being endowed with the desire of wealth and an aversion to labor, we may yet suppose that few persons would quarry stone, or fire a locomotive if they might enjoy the same income while stopping at home. The scale of benefits must accordingly make up its account with the temptation to malingering; but it need not otherwise, on

social grounds, depart from the principle of full wage loss.

The determination of the wage loss occasioned by temporary disability is relatively simple. It may be assumed, without much violence to the facts and without serious hardship to employer or employed, that the average weekly earnings of the injured just prior to the injury would, but for that event, have continued in effect. The like assumption will not hold in the case of death or permanent disability. Wages fluctuate with prices and may be halved or doubled within the space of five years. Wage loss is the amount of wages foregone and must obviously be measured by current, rather than past, wage rates. A coal miner who was permanently disabled in January, 1916, lost, during that year, \$700, in 1918, \$1,200, and in 1920, \$1,500.⁵ Full compensation for his disability, based upon pre-war wages, would have been utterly inadequate, in 1920, to maintain his pre-war standard of living or to make good the wage suffered by reason of his injury. *Vice versa*, adequate compensation based upon the peak of war wages might easily come to exceed the full-time weekly earnings of an able-bodied workman at the neap of the post-war depression. If, then, the purpose of compensation be to maintain the standard of life of the injured workman and his dependents, wage loss ought to be measured by current wage rates for the same occupation and locality.

In practice, however, current wages are an inapplicable measure of wage loss over long intervals of time. Periodic revision of all awards for death and permanent disability would entail insuperable administrative difficulties. The amount of compensation incurred in any given year would be subject to the like continuous revision, employers could never determine the proper charge to be made in production

costs, and the calculation of insurance rates on any other than the unlimited assessment or current payment plan would be impossible.⁶ To claimants, also, the uncertainty and delay incident to frequent revision of awards would outweigh the possible advantages. In short, any attempt to circumvent the vagaries of the price system by a sliding scale of money payments would raise more difficulties than it would remove. All deferred obligations and all fixed incomes, whether from investments, annuities or life insurance, are equally affected with compensation payments by fluctuations in the value of money. That such fluctuations are an unmixed evil none will deny, but to stabilize the monetary unit transcends the scope of indemnity for work injuries as it transcends the scope of life insurance or of loan contracts. With all its imperfections, therefore, the actual wage of the injured at the time of injury remains the best practical basis of compensation.

Actual wages, as the basis of compensation, should be taken to mean the average full-time weekly earnings of the injured for a reasonable period—say six months—next preceding the date of injury. "Full-time" relates, of course, to the standard working week for the occupation and locality in which the injury occurred. Exceptional overtime pay is thus disregarded, as is also loss of time by sickness, shut-down or other adventitious cause. In the case of seasonal or part-time employments the total of the injured's earnings in all his avocations ought to be taken as the basis of compensation. Wages should be so defined as to include any bonus or other "extras," such as board, lodging or "tips." Most compensation acts do, in fact, define wages substantially as herein indicated.

To the rule of actual wages at the time of injury an exception should be made in the case of permanent disability

to a minor. The earnings of a boy of sixteen are not a reasonable basis for the measurement of a wage loss which extends over the natural duration of life. Compensation in such case should be based upon the wages which the minor would probably be able to earn at his majority rather than the wage which he was actually receiving when injured.⁷

The acceptance of wage loss as the measure of indemnity prepares the way for detailed discussion of the scale of benefits. Three well-marked severity grades of injury are to be provided for—death, permanent disability and temporary disability. Each of these broad categories presents problems so far peculiar to itself as to require distinctive treatment. The recipients of compensation and the criteria of wage loss are not the same for death as for disability and the risk of malingering in cases of disablement is inversely proportionate to the degree of severity. Administratively, also, the three types of injury are quite distinct; payments for temporary disability cease within a few weeks or months, payments on account of death or permanent incapacity continue over many years. In total cost, lastly, under any adequate scale, death and permanent disability pensions far outrun the aggregate amount of temporary disability and medical benefits (Table I). To define appropriate standards for each of these classes of benefits, in the order named, is the task undertaken in the ensuing pages.

TABLE I

RELATIVE COST OF FATAL, PERMANENT AND TEMPORARY INJURIES,
UNDER AN ADEQUATE SCALE OF BENEFITS

SEVERITY OF INJURY	NO. OF INJURIES	TOTAL COMP. COST— INCLUDING MEDICAL	AVERAGE COST PER INJURY	PER CENT OF ALL COST
(1)	(2)	(3)	(4)	(5)
All Compensable Injuries	100,000	\$35,120,200	\$ 350	100
Deaths	1,000	8,527,700	8,530	24
Perm. Total Disabilities	100	2,765,500	27,660	8
Maj. Penn. Partial Disabilities	1,200	12,456,000	10,380	35
Minor Permanent Injuries	3,700	2,331,000	630	7
Temp. Disabilities—over 7 days	70,000	8,750,000	125	25
Temp. Disabilities—3 to 7 days	23,000	230,000	10	1
Non-Compensable Injuries	—	60,000	3	—

The frequency distribution of injuries in the above table is based upon "The American Accident Distribution," issued by The National Council on Workmen's Compensation Insurance, 1920. The estimated compensation cost (column 3) was obtained by applying the benefits herein-after outlined to accidents reported to the Insurance Department of Pennsylvania for the policy year 1920.

DEATH BENEFITS

The economic loss occasioned by a fatal injury falls, not upon the injured workman himself, but upon his dependents. Socially considered, the measure of loss is the productive capacity of the deceased, reduced to terms of working-life expectancy. To the dependents, however, the loss continues only during dependency and is less than the full wages of the deceased by the amount of his personal consumption. The true measure of compensation, then, will be found by ascertaining the net contribution made by the deceased

breadwinner to the family budget, or—which comes to the same thing—by deducting from his wages the cost of his own maintenance. The amount to be deducted on this account will vary with the size of family and the number of wage-earning members. In a family of two adults the male breadwinner will consume, upon a rough average, sixty per cent of his own earnings; in a household which comprises four or five young children the father's share in the general budget will rarely exceed twenty-five per cent.⁸

It follows from the foregoing considerations that the rate of compensation in case of death should vary with the number, ages, and family relationship of the dependents. Exactitude in such a matter is unattainable but the scale below suggested appears to be consonant with the known facts of family budgets and with the ostensible purpose of a compensation system.

To a widow, if the sole dependent, forty per cent of wages; to a widow and child, fifty per cent, with ten per cent for each additional child up to a maximum of seventy-five per cent to a widow and four or more children; to a child, if the sole dependent, the same allowance as to a widow, with the like increment of ten per cent for each additional child, up to the maximum of seventy-five per cent for five or more children.⁹

This compensation ought, of course, to run for the duration of dependence—to a widow during widowhood, to a child during childhood and adolescence. The best opinion of physicians and educators extends adolescence at least to the age of eighteen. The like term of compensation has been accepted in the more enlightened jurisdictions.

The claim of parents, younger brothers and sisters, nephews, nieces and other collateral dependents is less absolute and less enduring than that of wife or child. The right of parents to the earnings of minor children, like the

right of a husband to the earnings of his wife, is a relic of the *patria potestas* which ought not to be tolerated in a modern civilized society. By the same token, the equitable claim of able-bodied parents to compensation for the death of a child is extremely dubious. It not infrequently happens, however, that an unmarried worker is the chief support of a family or is jointly responsible with others for the maintenance of aged or invalid parents. Death benefits in such case ought, of course, to be paid in accordance with the facts of dependence.¹⁰

A moderate funeral benefit, lastly, is a usual and appropriate supplement to the death benefit. The amount should be sufficient to provide a "decent burial" in accordance with prevalent funerary customs and should be allowed in all cases, irrespective of dependency.

PERMANENT DISABILITY BENEFITS

Permanent disabilities are commonly distinguished as permanent total, major permanent partial, and minor permanent. The actual gradations of severity are, of course, much more numerous than this classification would indicate, ranging all the way from total helplessness to the loss of a finger joint. Nevertheless these broad categories have their uses, both as convenient statistical divisions and as appropriate groupings of compensation benefits.

The test of permanent total disability, from a compensation standpoint, is permanent incapacity for employment as a wage worker. The invalid need not be confined to his bed or to a wheel chair; he may even be able, under appropriate conditions, to do a certain amount of light work; tend the fire, pare the potatoes or hoe the garden. It is enough that he is unable to follow an ordinary gainful occupation. Permanent total disability ought to be con-

clusively presumed (as in most compensation acts it is) from blindness of both eyes or from the loss or loss of use of both hands, or both feet, or of one hand and one foot. There are, however, many cases of permanent total disability not covered by this enumeration (Table IV), as also a large class of near-total permanent disabilities—partial paralysis, malformation of the spine, traumatic epilepsy or vertigo, near blindness, and the like. The victims of such disabilities may have some slight earning capacity in a "suitable employment," but they are so nearly unemployable as to be mainly dependent upon some means of support other than their own labor.

The economic loss attributable to disability, total or partial, permanent or temporary, falls immediately upon the injured worker and is the same to an unmarried man as to the father of seven children. Compensation ought, therefore, to run for the period of disability and be directly proportionate to the impairment of earning capacity. To permanent total disability this rule applies without qualification. There is no chance of malingering to justify any deduction from full wages, nor is any deduction to be made, as in the case of death, for the victim's own maintenance. Whether the victim be married or single, young or middle aged, his economic loss is equal to his normal wage and endures for the remainder of his life. Adequate compensation for permanent total disability can be nothing less than a life pension at one hundred per cent of wages. For near-total permanent disability compensation should be a life pension at sixty to ninety per cent of wages, in accordance with the actual earning capacity of the injured. Many of those who are totally and permanently disabled die, after a longer or shorter interval, as the direct or indirect result of their injuries. Even if death does not directly supervene,

severe shock and extensive lesion, long confinement and the sudden transition from a life of labor to one of quiescence, impair vitality and lower the resistance to disease. If the chain of causation from injury to death be unbroken, even over an interval of several months, death compensation is usually awarded under existing statutes. But death during the continuance of total disability and within two years of the date of injury ought, in any case, to be imputed to the injury as a matter of legal presumption.

TABLE II
INJURIES RESULTING IN PERMANENT TOTAL DISABILITY
(Pennsylvania Compensation Insurance Experience)

INJURY	NO. OF DISABILITIES	PER CENT OF ALL
All Permanent Totals	547	100.0
Fracture of skull—paralysis, insanity or imbecility	57	10.4
Fracture or dislocation of vertebrae—paralysis...	191	34.9
Fracture of pelvis	47	8.5
Fracture or dislocation of hip joint	40	7.3
Blindness of both eyes	55	10.0
Fracture of both legs—loss or loss of use	23	4.0
Fracture of both arms—loss or loss of use	15	2.7
Amputation of both hands	5	—
Fracture of arm and leg—loss or loss of use	35	6.2
Fracture or dislocation of both ankles	20	3.6
Loss of hand and eye	1	—
Dislocation of shoulder	3	.6
Dislocation of knee	3	.6
Internal injury—thoracic	12	2.1
Internal injury—abdominal	8	1.4
Body burns	15	2.7
All other	17	3.1

N. B. It will be seen that the actual loss of "both eyes, both hands, both feet, or any two thereof" (the usual statutory description) is comparatively rare. But most cases of paralysis from fracture of skull or vertebra would fall within the description of loss of use of both arms or both legs and many cases of fractured pelvis amount to loss of use of both legs. The conclusive presumption indicated in the text would cover about seventy per cent of the cases reported in Pennsylvania compensation insurance experience.

Permanent partial disabilities are of every degree of severity, from minor impairments to nearly total loss of earning capacity. It is of the first importance, therefore, in constructing a scale of permanent partial disability benefits, to fix upon an appropriate measure of the degree of incapacity. Two contrasted methods divide the field. Many statutes make compensation to depend upon the physical injury irrespective of its economic consequences to the particular workman involved. The alternative is to compensate for loss of earnings which is ascertained by comparing the wage that the injured is currently able to earn, either with his average earnings at the time of injury, or with the current standard wage for the same occupation and locality. Both methods of reckoning disability may occur in the same scale of benefits and may even be applied to the same injury.

Loss of earnings would appear at first sight to be the true measure of disability. Compensation purports to make good an economic loss; surely the extent of loss can be ascertained from the actual earnings of the injured. Yet, when put to the proof, this seemingly obvious measure develops a fatal want of exactitude. The earnings of a partially disabled workman are affected, not alone by the degree of his disability, but by his personal skill and assiduity, by his opportunities for employment and by the general level of wages. By the usual statutory test of money wages before and after injury a half-incapacitated workman whose disability dated from 1914 would have drawn no compensation in 1919, notwithstanding that his wage was then much below the prevailing rate for able-bodied workers, and notwithstanding that his command of necessities was but half what it had been at the time of injury.¹¹ Comparison of the insured's earnings with the current standard

wage for his occupation will avoid this particular injustice, but it will give a fluctuating rate of compensation for the same injury to the same workman. In a time of rapidly rising prices, when the tide of industry is full and employers are eager to enlarge production, a one-armed man may obtain steady work at good wages; in a period of industrial depression, he will be hard put to hold the meanest job.¹² The difficulty is aggravated by the fact that the partially disabled, in ordinary times, drift perforce from job to job, with widely varying rates of pay. Whence it comes to pass, by the mere rise or fall of the general wage level, by fluctuations in the demand for labor, or by the accidents of casual employment, that compensation to the same workman will range from fifty cents to fifteen dollars a week within a twelvemonth, though his actual physical disability remains all the while unchanged.¹³

On mere administrative grounds, continual revision of permanent disability awards to accord with the actual earnings of the injured is clearly impracticable. Accumulated over the average life expectancy of permanently disabled workmen, the number of awards to be annually reviewed in New York or Pennsylvania, would presently reach fifty thousand. Each case would require investigation and the taking of testimony. Claimants would not voluntarily accept reductions, employers and their insurance carriers would not voluntarily grant increases. The claimant would be required to show his actual earnings over a period of perhaps six months and the amount that he would probably have been able to earn but for his disability. As a device for promoting litigation nothing could be better. Applied to a restricted class of permanent disabilities, and within a time limit of five or six years, the loss of earnings rule has already produced endless disputes

and the delay, denial or suspension of compensation to hundreds of workmen who are indubitably disabled for life from earning full wages.¹⁴

But the evil of fluctuating rates of compensation to the same workman for the same disability goes much beyond practical inconvenience; such fluctuations disastrously affect the workman's willingness either to undergo re-training or to put forth his best efforts as a wage earner. Why exert himself when his compensation will be reduced in the same proportion that his earnings are increased? Why acquire a new occupation if thereby he forfeits all claim to further indemnity? Temporary employment of a partially disabled worker at full wages is too often followed by dismissal so soon as the compensation claim has lapsed or been terminated by agreement. The new occupation, hopefully acquired, too often proves an uncertain means of livelihood. But let the injured workmen be assured, once for all, of a definite compensation, not to be diminished so long as his physical disability remains the same, and he will have every incentive to improve his earnings. Very much that passes by the name of malingering is, in reality, a well-founded fear of forfeiting compensation without being able to hold a place in industry. Much of the reluctance manifested by industrial as by war cripples to undergo re-training is due to the maladroit device which rewards the victim's zeal therein by cutting off his indemnity. The way to promote rehabilitation is not to penalize it.

Physical disability is the practical alternative to actual earnings as the measure of economic impairment. The physiological rating of disability assumes that the loss of earning power is proportionate to the loss of bodily function and that the economic consequences of a given physical injury are substantially independent of the injured's age

and occupation. Neither assumption **is strictly true to** fact. The loss of a leg is not so serious to a linotype operator as to a railway brakeman and an index finger has not the same importance to a coal miner as to a violinist. But no schedule can take account of every circumstance which affects the earning capacity of an individual. Age differences are, in great part, automatically cared for by the system of life pensions: if the weekly rate to an elderly man be smaller in relation to his present loss of wage, his pension will continue longer in proportion to his working-life expectancy. As to occupational differences, it is to be remarked that a close interdependence exists between occupation and type of injury.¹⁵ A linotype operator does not lose his foot, nor a violinist his finger, in the course of employment. Highly specialized occupations, furthermore, are quite exceptional in modern industry. The great bulk of wage earners are so little tied to particular callings that they may and do shift from steel mills to coal mines, and from logging to railway construction. An elaborate occupational schedule of disability ratings¹⁶ is an esoteric refinement, uncalled for by the facts of industrial employment. By and large, the loss of a hand is a permanent disability of much the same degree whether the sufferer be a blacksmith or a stone-mason, a shingle-sawyer or a stevedore.

The physiological method of disability rating seeks to measure the severity of an injury by the usual or average effect thereof upon earning power. It disregards circumstances peculiar to the individual and looks to the general experience of industrial workers over the whole course of their working lives. The loss of an eye, *e. g.*, may not, in a particular instance, immediately disable the workman **from** earning his usual wage. Yet in most occupations, the

blindness of one eye is a very sensible handicap; it restricts the opportunities of employment, causes much personal inconvenience, and greatly enhances the risk of total disability by disease or injury of the remaining eye. Having regard to all these contingencies, the loss of an eye may reasonably be said to constitute a serious permanent impairment of earning capacity, irrespective of its short-term effects upon actual earnings.

Physical disability is by no means a perfect measure of industrial incapacity, but it appears to be the best practical indicium of wage loss for the purposes of compensation. It affords a far more definite standard than post-injury earnings, is more readily applied, works, upon the whole, less injustice to individuals, and has the prime advantage of fixing a stable rate of compensation for a given injury to a given workman. The actual extent of physical disability is relatively easy of ascertainment. The functional impairment of a limb, the reduction of vision in an eye, even the loss of memory or of muscular control, are matters about which competent and disinterested medical opinion will not widely differ. Certain injuries may be simulated, but it is much easier to detect such simulation than to ascertain how far a partially disabled workman could increase his earnings by conscientious effort. The physical disability standard, in short, avoids most of the uncertainties and inequalities which beset the application of the loss of earnings rule. And the acceptance of this standard enormously simplifies procedure by permitting the use of a specific indemnity schedule which assigns fixed rates of compensation for stated physical disabilities. A fixed schedule may be thought a crude device; it ignores many circumstances which affect the actual impairment of earning capacity in particular cases and fits unlike degrees of disability to the same pro-

crustean bed. But to one who is familiar with the practical working of a compensation system, who has witnessed the delays, uncertainties and denials of compensation attendant upon the loss of earnings rule, the gross discrepancies in awards for the identical injury to different workmen in the same occupation, the repeated suspensions, increases and decreases of compensation for an unvarying and life-long disability of the same individual—to one who has seen these evils at first hand, the admitted weaknesses of a specific indemnity schedule will seem small in comparison with its advantages. It is no slight gain that the great bulk of permanent disability claims shall be adjusted with the minimum of delay, upon the basis of undisputed facts, but it is a still greater gain that some substantial indemnity shall be assured for every permanent injury.

If the foregoing conclusions may be accepted as sound, the appropriate compensation for a major permanent partial disability is a life pension at a fixed percentage of the injured's wage at the time of injury, determined in accordance with a specific schedule of physical disabilities. The rational foundation for such a schedule would be a statistical and case study of the actual earnings of partially disabled workmen, in diverse occupations and localities, over a long period of years. The outcome of an intensive study of this kind upon a sufficient scale should be a specific indemnity schedule which would fairly reflect the average economic results of given physical impairments, and which might even take account of specialized occupations. Nothing at all adequate to the purpose has anywhere been attempted.¹⁷ All existing schedules are founded primarily upon medical ratings of physical disabilities, modified by legislative compromise between opposing interests. The schedule below suggested is frankly tentative but is based

upon careful comparison both of existing schedules and of such medico-statistical studies as are available.¹⁸

SCHEDULE OF SPECIFIC INDEMNITIES FOR ENUMERATED PERMANENT
DISABILITIES

INJURY	INDEMNITY
For loss or complete loss of use of:	A life pension at specified per cent of injured's wage at time of injury:
Hand	.50 per cent of wages
Leg, at hip.	.75 per cent of wages
Leg, at knee.	.50 per cent of wages
Foot	.40 per cent of wages
Eye.	.30 per cent of wages
Hearing, one ear.	.25 per cent of wages
Hearing, both ears.	.50 per cent of wages

Impairment of a major member to the extent of twenty-five per cent or more should be compensated by a life pension at a rate proportionate to the degree of impairment. Such a schedule would cover at least nine-tenths of all major permanent partial disabilities. Major permanent injuries not within any of these descriptions, and not amounting to permanent total disability would needs be compensated either under the loss of earnings rule or under a sliding scale for near-total disability in proportion to the degree of physical impairment.

It is the intent of a specific indemnity schedule that awards thereunder shall be fixed as soon as the actual extent of physical disability is determined and shall be subject to revision only upon the ground that physical disability has increased or diminished. Whatever the injured worker may achieve, by re-training or otherwise, in the way of increased earnings would thus redound to his own advantage. In exceptional cases, doubtless, the pensioner will contrive to overcome his handicap and to earn the wages of an able-bodied worker. But the one-armed machinist, the three-fingered baseball pitcher and the blind painter of pictures

who cut so large a figure in the carry-on literature of war time, are a little reminiscent of the one-legged pirate whom Stevenson endowed with the attributes of a formidable fighting man. It is doubtful whether John Silver himself would have made good as a stevedore, and it is certain that few of the halt, the maimed and the blind hold an assured place in ordinary employments.

The discussion thus far has centered upon those major disabilities which amount to life-long impairment of earning capacity. It remains to consider the very numerous class of minor permanent injuries. The class especially relates to the loss, or loss of use, of fingers and toes but comprises also slight functional impairments of the major member.¹⁹ A majority of these injuries can scarcely be said to constitute permanent disability. The hand soon adapts itself to the loss of a digit (other than thumb or index) so as to do its work nearly as well as before the injury. The loss of a thumb is a more serious handicap, because it interferes with grasping power and destroys that feature of opposability which is the distinctive characteristic of the human hand. The loss of both thumb and index impairs the industrial usefulness of the hand by at least one-half and the loss of any two fingers is a sensible handicap. Of the toes, only the first is functionally important. The number of finger dismemberments is very large,²⁰ and exact determination of the resultant loss of earnings is impracticable. A specific indemnity schedule for these injuries is appropriate both on grounds of administrative convenience and to assure uniform awards for the same injury to different workmen.²¹ Since the actual permanent disability is usually slight and since a very small life pension is of little value to the workman, the schedule may properly take the form of a specified rate of compensation for definite periods—say fifty per cent

of wages during four years for the loss of a thumb, two years for the loss of an index finger, and one year for the loss of any other finger. It should be open to the administrative tribunal to award greater compensation where the actual disability exceeds the specified scale. The loss of a thumb and index or of any three or more fingers should be treated as a functional impairment of the hand and compensated proportionately.

Permanent partial disability, whether major or minor, is usually preceded by a period of total disability which results immediately from the injury. During this "healing period" compensation should be paid as for temporary disability.

TEMPORARY DISABILITY BENEFITS

From the standpoint herein adopted, adequate compensation for death or permanent disability is the full wage loss therefrom resulting to the injured workman and to those dependent upon him. The social grounds for the like measure of compensation in the case of temporary disability are less cogent and the objections thereto are more persuasive. In the event of permanent disablement or death full compensation is necessary to maintain the standard of life of the family affected, while malingering, the sole valid objection to full compensation, is impossible in the one case and in the other relatively easy of detection. Temporary disability is more easily simulated and the number of cases is so large as to defy close and continuous scrutiny. Full indemnity for disabilities of a temporary character would undoubtedly induce malingering to a serious extent and create an immense amount of litigation. The economic loss is less severe and the failure of full compensation causes less hardship than in the case of a fatal or a serious permanent

injury. It appears expedient, theretore, that some portion of the wage loss which results from temporary disability should be imposed upon the individual victim thereof.

Three devices are usually introduced into compensation acts which serve to throw upon the injured workman, not the lesser, but much the greater part of the economic loss resulting from temporary disability. These devices are: (a) the "waiting period," during which no compensation is payable, (b) the allowance, after compensation begins, of a stated percentage instead of full wages, and (c) the fixing of a maximum weekly rate which for many workmen is below the nominal percentage of wages. The cumulative effect of these several limitations is fairly startling. **The** wage foregone by an anthracite miner during four weeks' disability in 1921 would amount, on the average, to \$150. His compensation under the Pennsylvania statute was nominally sixty per cent, or \$90; in fact, by the ten-day waiting period and the maximum weekly rate it was reduced to \$30. Even under the most generous of our American benefit scales it is doubtful whether compensation equals forty per cent of the aggregate wage loss on account of temporary disabilities.

The waiting period is supported on two grounds—that without this device administrative tribunals would be swamped with petty claims, and that, if compensation ran from the date of disability the temptation to take a holiday for every trivial injury would be irresistible. As to the second of these arguments, it seems probable that the fixing of compensation at a reasonable percentage of wage will, in itself, sufficiently penalize malingering. The justification for the waiting period, if justification there be, is the desirability of excluding petty claims. A disability of two or three days causes little hardship whereas the ad-

ministrative cost and trouble of handling a vast number of very small claims would be disproportionate to the social gain.²² To bar such claims without prejudice to more serious injuries some laws provide that no compensation shall be paid for a disability which terminates within a specified number of days but that if disability continues beyond this period compensation shall begin from the date of injury. This plan, however, has the disadvantage of offering an inducement to prolong the absence from work on account of a disability which actually terminated within the non-compensable period. If the waiting period be not excessive, no great harm can result from leaving it out of account in all cases. Three days may be accepted as reasonably sufficient to exclude trivial injuries without inflicting serious hardship upon those who are disabled for an appreciable time.

The rate of compensation should be something less than full wages so as effectually to discourage malingering, but it should approach, as closely as this limitation will permit, the maintenance of the worker's standard of life. Two-thirds of wages appears to be the generally accepted standard,²³ but the two-thirds rate, coupled with a waiting period, is of doubtful adequacy. Few wage workers have such a plethora of income that they can forego one-third of normal earnings, even for a few weeks, without serious inconvenience to the family budget. Seventy-five per cent of wages would better meet the prime requisite of comfortable support during incapacity and would, at the same time, sufficiently penalize voluntary absence from work. Even the seventy-five per cent rate, with a three-day waiting period, requires the injured workman to bear one-third of his wage loss during a disability of four weeks (Table III). Will anyone assert that less than two-thirds of actual wage loss is an

adequate indemnity? When, to exorcise the bogey of malingering, benefits are pitched upon an inadequate scale, the primary object of a compensation system is in so far defeated. Genuine malingering, even under a seventy-five per cent rate, will probably be rare and can be kept in check by appropriate administrative supervision.

Whatever the rate of compensation there can be no rational justification in ethics or economics for a fixed maximum weekly amount. If a skilled workman was earning \$50 per week at the time of the injury a weekly allowance of \$20 is utterly inadequate to maintain his standard of living. There is some ground for excluding high-paid executives from the compensation system, but there is no just ground for basing compensation to a locomotive engineer upon the wages of a track laborer. Full indemnity to the one will cost no more, in relation to the employer's payroll, than full indemnity to the other, the principle of occupational risk applies equally to both, and the community's interest lies rather in raising than in depressing the standard of life of the skilled as well as the unskilled.²⁴

TABLE III

RATIO OF COMPENSATION TO WAGE LOSS ON ACCOUNT OF TEMPORARY DISABILITY

COMPENSATION RATE IN PER CENT OF FULL WAGES (No Maximum) (1)	WAITING PERIOD (2)	PERCENTAGE OF COMPENSATION TO WAGE LOSS FOR DISABILITIES OF EACH SPECIFIED DURATION						
		All Over Three Days *	One Week	Two Weeks	Four Weeks	Six Weeks	Eight Weeks	Thirteen Weeks
		(3)	(4)	(5)	(6)	(7)	(8)	(9)
66 $\frac{2}{3}$	Two Weeks	40	—	—	33.3	45	50	55
66 $\frac{2}{3}$	One Week	50	—	33.3	50	55	58	62
66 $\frac{2}{3}$	Three Days	60	33.3	50	58	60	62.5	65
75.....	One Week	60	—	37.5	55	62.5	66	70
75.....	Three Days	67.5	37.5	55	66	69	70	72

* Estimates for this column are based upon experience under the U. S. Employees' Com*
pensation Act, with a three-day waiting period.

MODE OF PAYMENT

All indemnity for death or disability should normally be paid in installments, continuing over the whole period of dependence or disablement. For temporary disability the installments should correspond to the weekly or bi-weekly intervals of wage payment; death or permanent disability pensions may well be paid monthly, as a matter of convenience. Commutations of future installments ought very rarely to be allowed. Few wage earners or their widows are able to make secure investments of considerable sums and fewer still can embark in business with any prospect of success. Lump sum commutations are more excusable under the familiar type of American compensation law which provides merely a grant in aid for a limited term. The present value at \$12 a week for 240 weeks may better be sunk in a lunch room or a chicken ranch than relied upon as a means of livelihood. Even so, commutations are too often made for the benefit of a solicitous attorney or a disinterested friend with something to sell.²⁵ Under an adequate scale of death and permanent disability benefits there will be little occasion for lump sum conversions. An annuity certain is better than cash in hand as a provision for future support.

MEDICAL BENEFITS

To relieve the suffering of the victims of industrial injuries and to restore their earning capacity as soon and completely as possible are primary objects of a compensation system. To these ends most compensation laws require the employer to furnish medical, surgical and hospital care, medicines and therapeutic appliances, when and as

needed; some few jurisdictions add a modicum of vocational rehabilitation.

The case for full therapeutic relief is stronger, even, than the case for full pecuniary indemnity. Apart from all humanitarian motives, every avoidable disability represents a net economic loss to the community at large. But avoidable disability is very often the price of insufficient medical care. The loss of life or limb too frequently results from neglected infection;²⁶ ankylosis and malformations which destroy the industrial usefulness of an arm or leg may often be prevented or relieved by appropriate operative procedure. To withhold skilled and expensive surgical attention in such cases, to curtail hospital care, or to refuse sanatorium treatment for incipient occupational tuberculosis, is uneconomic to the last degree. The niggardly limits upon medical aid so prevalent in American compensation acts are, in fact, corollary to inadequate pecuniary benefits. When the price of a hand is set at \$2,000 there is no great incentive to employ the best that modern surgery has to offer. But if compensation for the loss of a hand were a life pension at one-half of wages, neither employers nor insurance carriers would stint their efforts to save the industrial use of a threatened member. Given an appropriate scale of indemnity for death and permanent disability and no objection will anywhere be raised to unlimited medical benefits.

Vocational rehabilitation and the provision of artificial limbs are of minor importance in comparison with direct medical, surgical and hospital care of the injured. Both are appropriate and often valuable measures of therapeutic aid, but the best mechanical contrivance is a poor substitute for the human hand and the most successful re-training is but a partial reparation for the loss of a bodily

function. Re-training, besides, is of very limited application. Few industrial cripples possess the aptitude or the preliminary education for success in non-manual pursuits, and few of the severely maimed can ever be fitted for industrial employment. By all means vocational guidance, re-training, light employment and other aids to the injured should be utilized whenever practicable. Whatever tends to repair the earning power of those who have suffered permanent injury, whatever gives them useful occupation, combats valetudinarianism and contributes to self-support, is so much to the good. But rehabilitation, however useful in its place, is not an appropriate substitute for compensation so long as physical disability persists. Until the blind eye shall be made to see and the missing limb shall be restored, adequate indemnity will be due over and above all vocational assistance and all medical relief.

NOTES

¹ In Wisconsin, during ten years' experience, no claim for compensation has been rejected on the ground—explicitly set forth by statute—that the injury was intentionally self-inflicted. There has been no such case in Pennsylvania in six years' experience, covering more than one million claims.

See *William vs. Tempest Brick Co.*, 2 Penna. Dept. Repts., 2673; *Watson vs. Pittsburgh Coal Co.*, 2 Penna. Dept. Repts. 2879; *State ex rel. Oliver Iron Mining Co. vs. Dist. Court of St. Louis Co.*, 138 Minn. 138; *Sparke Milling Co. vs. Industrial Commission*, 293 Ill. 350.

² The writer well remembers sitting in the office of a division train dispatcher while three freights passed in close succession on the same "block." Said the dispatcher in explanation; "Yes, it's against the rules, and if anything happens I'll get the sack. But those are through freights and I'd be sure to catch Hell if I held them up."

³ Fuse firing, working gassy mines with open lights, pushing trips, and other extra-hazardous practices common in the mines, are not instances of individual carelessness but methods of work established and maintained by operators.

⁴ It should be added that men of a hyper-cautious temperament do **not** elect these particular occupations.

⁶ The average weekly wages in the bituminous mines of Pennsylvania, as derived from accident reports, were:

1916, \$17.62; 1917, \$22.38; 1918, \$28.32; 1919, \$29.55; 1920, \$36.95.

The working year averaged 220 days, or 40 weeks of five and one-half days each, but was 250 days in 1918 and only 200 days in 1919.

⁶ See *post*, Ch. V.

⁷ Wisconsin, *e. g.*, so provides.

⁸ See an interesting study of family budgets, from this point of view, by Sydenstricker and King in *The Journal of Political Economy*, July, 1921.

⁹ The term "widow" is, of course, intended to include (as in most compensation acts) a dependent widower. It should also include any lawful wife, whether or not living with her husband at the time of his death, a divorced wife to whom alimony had been awarded in the decree of separation, and a common law wife with whom the deceased was actually living at the time of injury.

The term "child" in like manner is intended to include (again as in most acts) posthumous child, illegitimate child, adopted child, grandchild, and any other minor to whom the deceased stood *in loco parentis*.

¹⁰ If there be no dependents there can be no compensation as ordinarily understood. Some American jurisdictions—*e. g.*, New York and Ohio—require the employer in such case to pay a fixed amount, as \$500 or \$1,000—into a special fund to be used for the rehabilitation of crippled workmen or to provide additional compensation for certain classes of permanent disability. This curious device is, at best, a clumsy and partial substitute for an adequate scale of permanent disability benefits. In any well balanced compensation system death benefits will stand on their own proper footing as indemnity to the dependents of the deceased.

¹¹ Such instances were of very frequent occurrence during the war period. The Federal Employees' Compensation Act, which purported to compensate for actual loss of earnings as gaged by wages before and after injury, had the unexpected result of giving no compensation for loss of hand, foot or eye. Typical awards during this period were: for loss of eye, \$117, loss of arm, \$42, loss of arm, \$3,193, loss of right hand, \$175, loss of index finger, \$116, loss of leg, \$320, loss of little toe, \$173.

See *Third Annual Report of U. S. Employees' Compensation Commission*, p. 46; also a thoughtful discussion of this subject in the *Fourth Annual Report*.

Similar results were had in Massachusetts. In most American jurisdictions the loss of earnings basis applies only to impairments, not amounting to total loss of use, of the major members. The specific indemnity schedules of most of our acts are grossly inadequate and unscientific, but they do give *some* compensation for loss of hand, foot or eye, which is precisely what the loss of earnings rule fails to accomplish.

¹² If a partially disabled workman be unemployed his actual wages cannot be used as a measure of his earning capacity. In such case three courses are open: to pay full compensation until suitable work is offered, to estimate the probable earnings of the injured in some suitable occupation, or to deny compensation until the injured has demonstrated his earning capacity by

finding a job. The usual practice is to suspend compensation during unemployment,

¹³ Many striking instances of rapid and extreme fluctuations in the compensation rate to the same workman, without change of disability, were encountered in the writer's examination of the Ohio State Fund. Similar instances, in any desired number, may be found in the files of the Compensation Board of Pennsylvania or of the Industrial Accident Board of Massachusetts.

¹⁴ On suspensions of compensation in cases of unquestionable permanent disability see Downey, *Audit of Ohio State Insurance Fund*, 1919, p. 44.

Quite half of the appeals from referees to the Workmen's Compensation Board of Pennsylvania involve petitions for the termination or reinstatement of compensation for partial disability.

¹⁵ This point is well illustrated by the industry distribution of permanent injuries, as shown by the compensation insurance experience of Pennsylvania set out below:

RELATIVE FREQUENCY OF SPECIFIED INJURIES PER HUNDRED CASES OF
MAJOR PERMANENT PARTIAL DISABILITY

(Penna. Compensation Insurance Experience, 1916-1920)

INJURY (1)	NO. OF MAJOR PERMANENT DISABILITIES (2)	PER CENT OF SAME RESULTING IN LOSS OR LOSS OF USE OF:		
		Arm or Hand (3)	Leg or Foot (4)	Eye (5)
All Insured Industries....	3577	30	20	40
Bituminous Mining.	763	19	29	40
Quarrying	131	20	18	54
All Manufacturing.	1784	39	10	42
Baking	44	80	5	7
Saw and Planing Mills....	122	44	12	32
Steel Mfg	153	21	22	49
Foundries	124	13	19	65
Machine Shops	179	32	6	58
Printing	39	80	5	—
Building Construction....	157	18	25	40

¹⁸ Such, *e. g.*, as the California Schedule.

¹⁷ Cf. *Bulletin of the U. S. Bureau of Labor Statistics*, No. 281, pp. 64-108. The paper by Carl Hookstadt, pp. 88-96, is especially valuable. See also paper by the same writer, "What Becomes of the Crippled Man in Industry?" *U. S. Monthly Labor Review*, July, 1918.

¹⁸ See *Report of the Committee on Statistics and Compensation Insurance*

Cost of the International Association of Industrial Accident Boards and Commissions, *Bulletin of the U. S. Bureau of Labor Statistics*, No. 276.

¹⁹ The distinction between major and minor permanent disabilities was suggested by the writer several years ago and has passed into common statistical use.

²⁰ There are about twenty-five finger dismemberments for every case of loss of hand.

²¹ Under the Pennsylvania Compensation Act permanent finger injuries are indemnified either as temporary disabilities or as loss of use of hand. The resulting awards are totally unrelated to the severity of injury, but depend upon the cleverness of the claimant's attorney, the amount of sympathy aroused in the referee, the medical testimony procurable as to loss of use of hand or the chance duration of disability. Thus for loss of thumb and index compensation has been as low as \$88 and as high as \$2,100, for loss of index finger, as little as \$10 and as much as \$500. The loss of four fingers is generally treated as loss of hand but has sometimes been compensated as a temporary disability in the amount of \$65.

²² Experience under acts which prescribe a very short waiting period or none at all seems to belie the contention that the number of petty claims thereunder would be excessive, but also clearly shows the very slight aggregate importance of such claims in relation to their number.

Under the Oregon act, with no waiting period, about twenty per cent of all temporary disability claims terminate within three days and twenty-five per cent between the third and eighth day after the date of injury. It would thus appear that a three-day waiting period excludes one-fifth, and a seven-day waiting period nearly the half, of the total possible claims. But disabilities of one week or less comprise only eleven per cent, and disabilities of three days or less only three per cent of the time lost on account of all temporary disabilities.—*Fourth Report of the (Oregon) State Industrial Accident Commission*, p. 26.

Under the Federal Employees Compensation Act, with a three-day waiting period, nearly twenty per cent of temporary disability claims are for disabilities of four to seven days' duration.—*Fifth Annual Report of U. S. Employees' Compensation Commission*, p. 91.

A three-day waiting period would add about fifteen per cent to the cost of temporary disability benefits, as compared with a one-week waiting period, or about three per cent to the total cost of an adequate scale of compensation.

²³ The standard recommended by the American Association for Labor Legislation.

²⁴ What is here said in condemnation of a fixed weekly maximum applies, of course, with yet greater force to death and permanent disability benefits.

²⁵ The Compensation Board of Pennsylvania, in the single year 1921, received 1,109 petitions for lump sum commutations, of which 779 were granted and 330 were refused.

²⁶ Infected cuts and bruises were responsible for 232 out of 2,930 deaths and for 260 out of 2,545 major permanent disabilities in Pennsylvania Compensation insurance experience, 1916-1919.

CHAPTER IV

THE ADMINISTRATION OF WORKMEN'S COMPENSATION

The most sweeping rule of liability for work injuries and the most liberal scale of benefits will fail to furnish the measure of relief that the legislature intends unless appropriate administrative means are provided to see to it that the benefits are paid in accordance with law. The beneficiaries of compensation are wage workers and their wives and children. The benefit payers are insurance companies and large employing corporations. In these facts reside both the power and the incentive to evade legal responsibility, withhold compensation and enforce unconscionable settlements. On the one side are abundant resources and a staff of practised claim adjusters; on the other are poverty, inexperience, ignorance of statutory rights, inability to obtain counsel except on ruinous terms and the pressing necessity for immediate relief.¹ For such disparity of circumstance, resort to the ordinary courts of law can afford no adequate redress.

It is not that the judges are biased: the courts have everywhere welcomed compensation laws and have usually interpreted the statutes in a liberal spirit. But with all good will on the part of the judges, the whole theory and practice of court procedure is unsuited to the needs of indemnity for work injuries.² Trial courts depend altogether upon the initiative of litigants. They do not go out to find the facts nor can they exercise effective supervision over uncontested settlements between the parties. To enforce his rights in a

court of law the claimant must hire a lawyer, procure witnesses, await a hearing and prosecute his case at his own charges or on the basis of a contingent fee. If he succeeds it is only after long delay and at a heavy cost in attorneys' fees—twenty, forty, even fifty per cent of his final award. Therein lies the opportunity of the claim adjuster. The certainty of expense and delay and the manifold uncertainties of litigation are powerful deterrents to a necessitous claimant and will often induce him to sign a release of liability for a fraction of the statutory compensation. The court, it is true, may set aside such a release but courts will rarely disturb an agreement between the parties unless formal proceedings to that effect are invoked by counsel.³ Probably a majority of death and permanent disability claims in every jurisdiction which relies upon court procedure are compromised at less than the amount prescribed by law. Yet it is precisely these cases that the courts are best able to adjudicate. Temporary disability claims fare much worse. The cases are far too numerous to be scrutinized by busy judges, the amounts involved are too small to engage the interest of contingent fee attorneys or to justify the cost of a suit at law. For the non-payment or underpayment of such claims the law courts afford no effective remedy. Claimants must deal with the adjusters as best they may and be thankful for what they get. **Court** procedure, in fact, is inadequate to the needs of workmen's compensation just because it is slow, costly and litigious in character. Its results in Great Britain and the United States have been everywhere the same: unjust settlements for fatal and permanent injuries and systematic underpayment of compensation for temporary disability, to say nothing of interminable delay and the diversion to lawyers of benefits intended for injured workmen and their families.⁴

The ends sought in the administration of a compensation law are the prompt and full payment of uncontested claims and the cheap, speedy and equitable determination of disputes. The indispensable means to these ends are effective supervision of settlements by agreement and appropriate tribunals for the adjudication of controversies. To necessitous claimants a costly remedy is no remedy at all. To a disabled workman and to his family delay itself is a denial of justice. In the public interest, moreover, no less than in the interest of the parties themselves, litigation, whether before a court or before a compensation commissioner, ought to be as much as possible avoided. Direct settlement ought to be encouraged if only for the sake of economy and dispatch. But direct settlement between parties so unequal as a foreign speaking widow and an international insurance corporation will too often mean oppressive settlement unless the rights of claimants are protected by the administrative arm of the state.

The actual work of administration is mainly supervisory. At least ninety-five per cent of all compensation claims are settled by direct agreement between the parties without reference to any tribunal.⁵ To see to it that such settlements shall be fair and that compensation thereunder shall be paid when due is the chief task of the administrative authority. Supervision, to be effective, must comprise the compulsory reporting of industrial injuries, scrutiny and follow up of agreements and receipts and appropriate penalties for refusal or delay of payment. Every injury which causes disability beyond the day on which the injury occurred should be immediately reported by the employer to the central administrative authority and the employee's return to work should be similarly reported.⁶

If disability continues beyond the waiting period proof

should be required from the employer or insurance carrier that compensation has been punctually paid in accordance with the law. A lag of ten days or two weeks after the expiration of the waiting period is probably reasonable for the first payment; subsequent installments should be paid at least bi-weekly. Every avoidable delay or interruption operates to defeat the remedial purpose of the law. Compensation is not simply a reimbursement for a loss suffered; it is intended to support the injured workman and his family during the incapacity of the breadwinner. Claim settlement ought, therefore, to be simplified as much as possible. It is not necessary that the employee shall file a claim, or submit proof of disability, or give written notice of injury, nor is it essential that a formal agreement shall be executed and approved. The employer's report of the injury and the supplemental report of the attending physician ordinarily state all the relevant facts—the names of employer, employee and insurance carrier, the occurrence of an injury in the course of employment, the disability resulting therefrom, and the weekly wage of the injured. These facts, in the absence of proof that disability has terminated, are sufficient *prima facie* ground for an interim award. The administrative authority should, upon receipt of the employer's report of an injury which caused disability for more than the duration of the waiting period, notify the employer or his insurance carrier to begin compensation at a specified date and continue same until employee has returned to work or satisfactory evidence is forthcoming that his incapacity has ceased. Proof of payment may properly be exacted in the form of duplicate vouchers for each installment together with a final receipt covering the whole amount, to be signed by the claimant and filed after disability has terminated. The duplicate vouchers are

evidence both of the date and amount of payment and admit of ready check against the date of injury and the weekly wage of the injured as disclosed by the employer's report. Delinquency in the filing of vouchers is *prima facie* evidence of delinquency in the making of payments and may be corrected by an appropriate follow-up system. The final receipt, again, is evidence that disability has ceased and that compensation has been paid in full. It should show upon its face either that the employee has returned to work at full wages or that he has fully recovered from the effects of his injury. None of these documents is more than presumptive proof of the facts which it purports to show. But, taken together, the employer's report of injury, the medical report thereon, the report of the employee's return to work, the payment vouchers and the final receipt will, in most instances, constitute a reasonably complete and authentic record of the case. Scrutiny and follow-up of these reports, vouchers and receipts, backed by suitable penalties, will assure the payment of indemnity as and when due for the vast majority of temporary disabilities.

There remain the quasi-judicial functions of deciding disputes and adjudicating death and permanent disability claims. The occurrence of an injury in the course of employment, the duration and degree of disability resulting therefrom, the wages of the injured and (in fatal cases) the number, ages and family relationship of dependents are the facts which govern compensation and which in the event of dispute must be established by competent evidence. In most cases of temporary disability the facts are uncontroverted and the documents filed as a matter of routine with the administrative authority furnish all the evidence required. Full opportunity must, however, be reserved to employees both to call in question the employer's statement

of facts and to present claims for injuries not reported by the employer. To this end every payment voucher and every final receipt should recite the date of injury, the rate of compensation, the weekly wage upon which the same is based and the period covered by the particular voucher or receipt. As regards acknowledged injuries the point most frequently contested is the date at which disability ceased. It is natural and proper precaution to suspend compensation upon the statement of the attending physician that the employee is able to return to work, but the claimant is entitled, upon demand, to have that fact determined by an impartial tribunal. The issue may be raised by a petition to that effect or by simple refusal to sign the final receipt. Many disputes, also, will arise out of unreported injuries and delayed disabilities. A minor cut or strain, scarcely noticed at the time, may by infection or subsequent aggravation cause serious disability or even death, a slight injury may incite latent tuberculosis to virulent activity and continuous exposure to industrial poisoning may bring on a lingering disease the beginning of which cannot be assigned to a definite date. In all these cases the likelihood of fraud, mistake or misrepresentation is such that the employer or insurance carrier will ordinarily resist the claim.

Controversies in respect to death and permanent disability claims are relatively far more frequent than in cases of temporary disability and the determination of the facts is more important and more difficult. Precise ascertainment of wages or even of the duration of disability will rarely be insisted upon when the total amount involved is small, but when a life pension is at stake every pertinent fact must be closely examined. Informal agreements are inappropriate and *prima facie* evidence is insufficient for the determination of payments which are to extend over

twenty, thirty, or forty years. Every case of death or permanent disability ought to be actually adjudicated and the compensation fixed by an award of record.

The process of hearing disputes and making decisions thereon should be as summary, as informal and as free from litigious features as is compatible with orderly procedure and full elicitation of the facts. Claimants ought not to be compelled to employ counsel, pay witness fees, travel long distances and await their turn upon a crowded docket. Hearings should be held frequently and at convenient points, witness fees and other trial costs should be paid by the state, and the actual need for attorney's services should be confined within the narrowest practicable limits. To dispense with lawyers, it is first of all essential that the compensation act itself shall be free from nice distinctions and common law phraseology. Such restrictive phrases as "arising out of the employment," "injury by accident," and "employee shall be synonymous with servant," promote litigation because their meaning must be sought in a long line of conflicting decisions. Good draftsmanship, explicit definition and the use of ordinary language will greatly facilitate adjudication. Next, the procedure must be far removed from that followed in the courts of law. Ritualistic formulae in petition and answer, technical rules of evidence, rigid distinctions of law and fact in findings and awards, inevitably throw the whole proceeding into the hands of attorneys. It is necessary that the parties have due notice of the hearing and be informed of each other's contentions, but the notice need not be served by a sheriff or the cause of action couched in language appropriate to the court of quarter sessions. The evidence should be relevant and the witnesses competent to testify of their own knowledge, but neither the one nor the other need be

governed by technical rules. The commissioner or referee who conducts the hearing should not merely control the proceedings but himself examine the witnesses, with or without the intervention of counsel. Above all, the administrative authority should be equipped to go out and find the facts, initiate proceedings of its own motion, make field investigations when necessary and decide disputable questions upon the testimony of impartial experts. The occurrence of an injury in the course of employment, the relationship of employer and employee, the status of dependents and the wages of the injured are facts easy of ascertainment and seldom controverted. The questions most often in dispute and most difficult of determination are of a medical character—the duration of disability, the degree of disablement resulting from an ankylosed wrist or the causal connection of an industrial injury with death by pneumonia. The adversative testimony of expert witnesses called by the respective parties is a most unreliable and injudicious mode of investigating questions of this class. Every such case should be referred to an impartial physician employed and paid by the board. This course is the more necessary because the attending physician is usually selected by the employer or insurance carrier and disposed thereby to minimize the gravity of the injury. Furthermore, the administrative board, through its own field investigators, should establish touch with the beneficiaries in every case of fatal or permanent injury, ascertain the names, ages and whereabouts of dependents, locate missing claimants, investigate delays and stoppages of compensation payments and initiate appropriate proceedings whenever the circumstances appear to warrant such action. All this may seem to duplicate the work of insurance claim adjusters. But the insurance carrier or uninsured employer

has often an interest in delay or suppression and certainly no interest in finding claimants or obtaining evidence on their behalf. Unless the administrative authority actively goes out to find the facts many persons entitled to compensation will fail to receive their legal dues and many others will obtain tardy justice only by the aid of counsel.⁷

The efficient adjudication of disputed claims is thus seen to be inseparably bound up with the detailed administrative work of supervision. In the measure that supervision is effective the number of controversies will be small and their determination easy. Adjudication itself is largely administrative in that antecedent investigation and the reports filed in regular course by employers, physicians and insurance carriers are often indispensable to the proper conduct of a formal hearing. It follows that a single administrative board or department should have jurisdiction over all the incidents of compensation. Inasmuch as the functions of the compensation authority are judicial as well as administrative, the board or commission type of organization, already familiar in American practice, would seem to be most appropriate. All administrative detail will necessarily devolve upon subordinates, just as the actual hearing of cases in a large industrial commonwealth must be delegated to district referees.⁸ But the board should retain supreme authority alike in the purely administrative and the quasi-judicial functions. All subordinates, from clerks to referees, should be appointed by and responsible to the board and the commissioners should interest themselves not less in administrative policy than in the decision of cases. The board should be irremovable except by impeachment and be paid salaries commensurate with the emolument of judges of the higher courts. The referees

should have a like permanence of tenure and the whole administrative staff should be protected by civil service rules.

Hearings of first instance will be conducted in the larger states by district referees or deputies; in the smaller, by the commissioners themselves, sitting singly. The referee should be empowered to summon witnesses, take testimony, call in disinterested medical advice, make investigations personally or through agents of the board, find the facts and make awards. The board should have plenary power to review the decisions of a referee or a single commissioner both as to law and facts and in the form either of a hearing *de novo* or of a review of the findings upon the record. Pending appeal the referee's award should stand and payments continue thereunder until final adjudication. This is a reversal of the usual rule of law but would be a salutary means of discouraging needless litigation and avoidable delay. The interim payments in case of reversal could not be large and the suggested rule amounts, after all, to no more than a reasonable presumption that the referee's findings are correct. Over and above its appellate jurisdiction the board should be empowered at any time to review, modify, set aside, revive or terminate any award, agreement or final receipt on the ground that the same was procured by fraud, coercion or mistake, that new evidence, not before obtainable, has come to light, that disability has increased or diminished or (in death cases) that the status of dependents has changed. This power of continuing oversight will do much to prevent unfair settlements in the first instance and is in any case necessary to provide for changes and contingencies that cannot be foreseen when the original agreement or award is made.

The grounds for allowing an appeal from the adminis-

trative board to a court are rather a matter of constitutional fetishism than of reasoned policy. Appeal from the referee, deputy or single commissioner to the full board is essential to the uniform and consistent interpretation of the statute at the same time that it presumably brings to bear upon the question at issue a broader experience and fuller knowledge. Court review of the commission's findings possesses neither of these advantages. There is no gain in uniformity since the commission itself is a single body interpreting a single statute. Indeed, just because appealed cases are few and involve a rather narrow range of issues, court review is apt to import inconsistency into the decisions of the board. Still less is there any advantage from the standpoint of special knowledge and experience in the subject dealt with. The commissioners ought to be, and often are, fully equal to the judges in intellectual ability and general attainments. They are daily deciding compensation cases and are familiar as no court of law can ever be with the practical effect of particular interpretations. Compensation, moreover, being purely statutory, offers little scope for that development and adaptation of the common law which is a chief function of the higher courts. The controversies turn mainly upon questions of fact and demand more of good sense and practical experience than of legal lore for their correct determination. Fortunately our courts, with few exceptions, have sought to discourage appeals by manifesting a very evident reluctance to overrule the commissions.⁹ But it nowhere appears that court review of compensation cases has served any useful end, whereas there have been numerous instances of the unsettlement of established practice, of unfortunate decisions which had to be corrected by legislation and of fine-spun distinctions which tend only to confusion. The titles "injury by accident" and "arising

out of the employment" in any digest of compensation cases will afford copious illustration.

If, on constitutional or other grounds, judicial review be thought desirable, the appeal should run directly from the administrative board to the court of last resort. An appellate decision by an inferior court settles nothing. If the case is carried up, the trial by the lower court is a waste of time; if many appeals are allowed to rest at the first remove the law is confused by conflicting decisions in the several judicial districts. Appeals to the highest court should be strictly limited to questions of statutory construction. "Questions of law," as usually phrased, carry too broad a connotation: it is a question of law, *e. g.*, whether the commission's findings of fact are supported by competent evidence. Whatever reasons may be advanced for making the supreme court the final interpreter of every statute, it will hardly be contended that appellate judges are peculiarly qualified to pass upon the credibility of witnesses whom they have not seen and the weight of evidence which they have not heard.

The hearing of disputed claims is by no means the chief work of a compensation board. The daily routine of receiving, docketing, scrutinizing, filing and following up reports, disapproving settlements which are *prima facie* incorrect, investigating injuries for which the documents are inconclusive, looking into complaints and delays, compiling records and making statistical analyses—this routine whereof the public takes little note is the very essence of efficient administration. The cases which come before the board or its referees for adjudication are few and the decisions thereon are important chiefly as they are given practical effect in the supervisory oversight of uncontested settlements. The board lays down the general policy of

administration, but it depends upon subordinate examiners, scrutineers and clerks whether the usual interval between injury and first payment shall be seventeen days or thirty-five and whether short-changing shall be rare or frequent. A competent ministerial staff is, on this account, scarcely less important than competent commissioners and referees.

In comparison with the primary task of administering compensation benefits, the compilation of statistics may be thought of little moment. Yet adequate statistics of work injuries are of the highest value to the safety engineer, the insurance rate maker, the compensation administrator and the framers of legislation. Of the use of statistics for insurance rate making and the prevention of industrial injuries something will be said in those connections.¹⁰ Here it is sufficient to point out that no amendment of the scale of benefits can be intelligently drafted or discussed unless the actual operation of the existing scale is known and that efficient administration is greatly promoted by appropriate analyses of the commission's own work. The amount of lag in the making of first payments, the time elapsed between the filing of a petition and the rendering of an award thereon, the number of contested claims, the type of injuries to which the contests relate and the points at issue, the number of claims ultimately denied by the commission and the grounds of denial, the number of settlements disapproved and of cases reopened, the frequency of appeals from referees to the board and from the board to the courts and the results of appeals so taken—these and the like facts are not merely a record of the commission's work and a ready test of its efficiency, but an exhibit of weaknesses in administrative methods and machinery. Nothing short of comprehensive and continuous statistical

analysis will develop such facts in usable form. In the consideration of compensation act amendments the questions most frequently asked are the justification of the suggested changes and the effect of proposed increases upon insurance rates or employers' costs. Here, again, the answers are purely statistical—statistics of wage loss on account of industrial injuries and of compensation cost under the existing and proposed benefits. But statistical analysis of work injuries should by no means be limited to the immediate needs of administration and law amendment. The commission has in its own files the original records of all reportable injuries. From these records statistics of compensation cost and of the cause, severity and frequency of injuries—whatever analysis in short is useful for administration, for prevention and for insurance—can be derived.¹¹ No other source of information is at all so complete or authentic and no other agency, public or private, is in position to compile comprehensive statistics of industrial injuries.

It may be thought that the compensation board as herein outlined, with its technical staff of claim examiners, medical advisers and statisticians, its numerous clerks and stenographers, its district referees and field investigators, will prove an expensive administrative machine. Yet the cost of adequate administration in a large state and with an adequate scale of benefits will not exceed one per cent of compensation insurance premiums. The entire amount, including witness fees and other costs of hearings, may very properly be charged upon insurance rates in the form of a specific premium tax. The small addition thus made to insurance rates will be little felt while the savings to the community at large in the avoidance of litigation, delay and oppressive settlements will be many times the total cost.

Nothing in the whole lexicon of political buncombe is more foolish or more insincere than pretended economies at the expense of efficient administration.

NOTES

¹ "Necessitous men are not, truly speaking, free men but, to answer a present exigency, will submit to any terms that the crafty may impose upon them."—Lord Northington in *Vernon vs. Bethell*, 2 Eden, p. no.

² "Law is in the nature of a cock fight, and the litigant who wishes to succeed must try and get an advocate who is a game bird with the best pluck and the sharpest spurs."—Manson in *Law Quarterly Review*, Vol. VIII, p. 161.

"The common-law theory of litigation is that of a fair fist fight, according to the canons of the manly art, with a court to see fair play and prevent interference. We strive in every way to restrain the trial judge and to insure the individual litigants a fair fight, unhampered by mere considerations of justice."—Pound, *Columbia Law Review*, Vol. V, p. 347. Cf. Pollock, *The Expansion of the Common Law*, p. 321.

³ The writer has personally seen in the examination of insurance companies many instances of compromise settlements for twenty or twenty-five per cent of the statutory amount which were formally approved by a court of record. See also "Three Years under the New Jersey Law," cited in Note 4, below.

⁴ The *Minutes of Evidence of the (British) Departmental Committee on Workmen's Compensation*, 1919-1920, contain much testimony to the inefficiency of court administration. The most thorough investigation of the subject yet made in the United States was published in the *American Labor Legislation Review* for March, 1915, under the title, "Three Years under the New Jersey Workmen's Compensation Law," pp. 36-102.

⁵ In Great Britain during 1908, under court administration, only 5,358 claims out of 328,957 were referred to county courts. In Pennsylvania, during 1921, 65,853 "agreements" were approved and only 2,408 petitions were assigned to referees. These examples are typical. The proportion of hearings to claims rarely exceeds 5 per cent.

⁶ Compare the definition of "reportable injury" recommended by the International Association of Industrial Accident Boards and Commissions.—*Bulletin of the U. S. Bureau of Labor Statistics*, No. 276, p. 17.

Injuries should be reported by the employer rather than the insurance carrier because the employer is the primary source of information and because insurance carriers have a pecuniary interest in the withholding of reports. With a three-day waiting period it is reasonable to require that report shall be made when disability terminates, or if disability has not sooner terminated, on the fourth day after the injury. This will avoid the necessity of a second report on thousands of minor injuries.

⁷ The regulation of attorneys' fees is a minor incident in a well-ordered system of administration. It goes without saying that moneys intended for claimants ought never to be paid over to counsel, that no lump sum commutation should be made for the benefit of attorneys and that the attorney's fee should under no circumstances be a lien against compensation. Attorneys are not the ostensible beneficiaries of a compensation system. A reasonable attorney's fee may, in exceptional cases and at the discretion of the compensation authority, properly be taxed to the defendant employer or insurance carrier or paid by the State. But, with a proper administrative system, counsel for claimants will rarely be needed or employed. For some remarks on the attorney evil under existing laws see *post*, Ch. VII.

⁸ The term used in Pennsylvania. The corresponding officers are called deputies in New York and examiners in Wisconsin.

⁹ In Pennsylvania, during 1921, 65,853 agreements were approved by the Compensation Bureau, 2,408 petitions were heard by referees, 620 cases came before the Workmen's Compensation Board (of this number 485 were appeals from referees' decisions), and 126 appeals were prosecuted from the Board to Courts of Common Pleas. Only 16 appeals were carried up to the Supreme Court.

¹⁰ *Post*, Chs. V and VI.

¹¹ For a comprehensive and well digested statistical plan, see *Bulletin of the U. S. Bureau of Labor Statistics*, No. 276.

CHAPTER V

COMPENSATION INSURANCE

The primary functions of compensation insurance are distribution of risk and security of deferred payments. Both functions are essentially involved in the social ends of workmen's compensation and both take on increased importance as the scale of benefits approaches adequacy. Under a low scale, with payments running but five or six years at the maximum, many employers are able individually to assume the risk of loss and to provide out of their own resources ample security that future installments of compensation will be paid when due. But under any adequate scale of benefits payments will continue to the permanently disabled for life, to widows during widowhood and to children to the age of eighteen. The cost of a single death or permanent disability will frequently exceed \$25,000 and pensions running for ten years and upwards will comprise far the greater part of all indemnity for work injuries. It is just these long continuing payments which are of the utmost social importance because upon them depend the nurture and education of whole families, and it is precisely these obligations that employers, individually, are least able to assume. Nothing short of collective responsibility or the accumulation of a trust fund can secure the continuance of payments running into the distant future and nothing short of insurance can distribute **the** burden of these costly injuries over the community at large. It follows that compulsory insurance, or its equivalent in

the way of security, is an essential feature of every effective compensation system.

To the employer insurance is important chiefly as a guarantee against abnormal cost. The number and severity distribution of work injuries per thousand employees and the resultant compensation cost per unit of wage or product are fairly stable from year to year in any large industry; sufficiently so, at least, for the predication of insurance rates. But whether a given establishment of moderate size will experience three fatal accidents in a single year or none in three years cannot be foretold. Still less is it possible to predict the cost of severe injuries among a small number of workmen. Compensation for a single death may be anything from the funeral benefit to twenty thousand dollars; a permanent total disability may occur to a man of twenty who lives for fifty years thereafter or to a man of sixty-five who dies within six months. The actual compensation cost for moderate sized establishments will, accordingly, fluctuate within wide limits. At individual coal mines, *e. g.*, the bill for work injuries may range from two cents to one dollar a ton, and this without the occurrence of a catastrophic accident. The small employer can neither control these fluctuations nor recoup himself for an outlay which greatly exceeds the average of his competitors: a single accident may wipe out his profits for several years or even throw him into bankruptcy. Insurance, by spreading the cost of expensive injuries relieves the employer from such fortuitous hardship. Compensation is thereby transformed from an unpredictable to a fixed charge which can be incorporated in the price of the product.¹ Only the very large employer is in position to attain this object for himself since it is only among large numbers of workmen that the cost of industrial injuries is reasonably stable.

But it is for the sake of employees, and not of employers, that compensation insurance is required by law. The entrepreneur is a man of business and may judge for himself whether insurance—fire, marine or casualty—will pay as a business policy. The interest of society goes much beyond these business motives: the state which has established a compensation system is bound to give effect thereto and compensation will fall much short of its intended efficacy if employers are left to their own devices in the matter of insurance. The ordinary employer, whether an individual, a co-partnership or a corporation, has neither the resources nor the longevity of business life safely to undertake payments which may run for half a century. Business mortality is high. Any trade directory of 1910 will contain a large proportion of names which had disappeared before 1920. Few of the greatest extant corporations can show a record of continuous solvency or even continuous existence for fifty years. Current assets in comparison with current liabilities are not a sufficient test of future ability to pay: many a corporation which appeared abundantly solvent in the year of grace 1919 is already in the hands of receivers. It will not do therefore to make long term compensation payments a charge, or even a preferred lien, against the general assets of an employing corporation; so far as such assets are not covered by mortgage bonds their future value will depend to a great degree upon the prosperity of the corporation, upon the state of the market and upon numerous other contingencies which lie beyond the prevision of administrative authorities. When the day of reckoning comes seeming-solid resources have too often melted into thin air and it is already too late to secure outstanding claims. No one acquainted with the history of the New Haven, the Chicago and Alton, the Western Mary-

land or the Interborough Rapid Transit would wish to make a railway or public utility corporation, to say nothing of a mining or manufacturing enterprise, the custodian of life insurance reserves. Compensation bears the same fiduciary character as life insurance and involves in almost equal degree the assumption of long-deferred obligations. There are but two modes by which such obligations can be securely met. Either the employer must insure his liability in a stable, solvent and strictly supervised insurance carrier or he must himself create a trust fund, with adequate surplus and reserves segregated from other assets and devoted solely to the payment of indemnity for work injuries. Such employer's funds should be subject to the same public supervision and examination as other insurance carriers and held to like standards of solvency. It is obvious that only very large employing corporations can afford to carry their own risk on these terms.

Even compulsory insurance will not guarantee the payment of compensation unless adequate measures are taken to maintain the solvency of insurance carriers. Whenever employers are free to elect among competing insurers, reserves sufficient to cover all future payments are indispensable to security. Competitive insurers have no permanent hold upon their clientele and no assurance of continued solvency other than accumulated surplus and reserves. A compulsory insurance monopoly, on the other hand, possesses a continuous power of assessment at any time and in any amount necessary to meet maturing obligations. Monopolistic insurers, accordingly, may safely adopt either the reserve or the assessment premium plan or any combination of the two.

Under the full assessment plan current premiums are just sufficient to meet current payments. The payments in

any given year on account of injuries which occur in that year are but a fraction of the amount ultimately to be paid—a fraction which is the smaller in the proportion that death and permanent disability benefits are adequate. But as time passes installments fall due on account of injuries which occurred ten, twenty, even fifty years before. Assessments, accordingly, are low at the outset and increase year by year, rapidly at first, then more and more slowly, over the course of half a century. When the plan has been long in operation much the greater part of current premiums will be devoted to past injuries. Such, in essentials, is the *modus operandi* of the well-known German employers' mutual insurance associations.² The great advantages of the assessment plan are simplicity and certainty of premium determination. Outstanding obligations are disregarded in the computation of premium rates. It is only necessary to estimate the payments which will accrue within the year for which an assessment is to be levied. The insurance monopoly may even meet maturing obligations by borrowing and may fix the assessment at the end of the year upon the basis of actually realized costs. Premium rates in any case can never be seriously excessive nor deficient. A moderate surplus will take up such fluctuations as may occur in the ratio of payrolls to accruing payments so that assessments need not greatly vary from year to year.³ The actuarial intricacies and uncertainties which beset rate making on the capitalized reserve plan are wholly absent. Premium computation becomes a mere matter of bookkeeping.

Against these manifest advantages of the assessment plan two objections are often brought: that it does not furnish full security for future payments and that it saddles current business enterprise with the cost of past injuries. Both objections are founded in misapprehension. It is true that

current assessments cover injuries which occurred long before, perhaps in business enterprises that no longer exist. But if present employers are thus saddled with costs incurred by their predecessors they in turn pass on their own deferred obligations to those who come after them. The maximum assessment rate (barring variations in the frequency and severity of injuries) can never exceed the initial full reserve premium.⁴ Nor is the employer greatly concerned with the absolute rate so long as his competitors must pay the same. It is true, again, that the assessment plan would be dangerously insecure if subscribers were free to withdraw as assessments rise. But a compulsory insurance monopoly faces no such danger.⁵ Its insureds cannot withdraw and new employers cannot refuse to enter. Nothing can jeopardize the solvency of such an insurer unless the power of assessment is unwisely limited or the insured group is unduly small.⁶

By the capitalized reserve plan, premium rates are based upon *incurred* as opposed to *accrued* liabilities. The liabilities incurred in a given year include, of course, the reserves necessary to carry to maturity all claims arising within the year. Reserves are simply the present or capitalized value of future payments. Claims which will mature at an early date are usually discounted for interest only or even taken at face value, but long term annuities must be discounted for interest, mortality and the probability of remarriage. All these estimates running into the distant future are affected with much uncertainty. Interest rates on standard securities may range from three to six per cent in the course of twenty years. Mortality is known to vary with occupation, race and locality, but the mortality of wage earners and of their wives and children has nowhere been carefully worked out.⁷ Remarriage rates of industrial

widows have yet to be investigated.⁸ Reasonable safety in face of these manifold uncertainties is only attained by resolving doubts in the direction of higher reserves and by more or less conjectural loadings. To the reserves so computed a substantial surplus must be added to take up fluctuations in loss experience and provide for catastrophic accidents.⁹ Surplus and reserves together constitute the security that maturing obligations will be met when due; the smaller the insurer the greater should be the surplus in proportion both to total reserves and to annual premium income.

If security of payment to injured workmen and their dependents be the first object of compensation insurance, the second is to relieve the individual employer of exceptional losses and establish an average compensation cost which can be charged into the expenses of production. Risk distribution in this sense would be sufficiently accomplished by a uniform rate of premium for all employments. No employer would thereby be placed at competitive disadvantage and no person or class in the community would be heavily burdened. Against this course, however, there are weighty objections. A single premium rate, the same for coal mining as for cigar manufacturing, would be clearly impracticable for competitive insurers.¹⁰ Furthermore, the graduation of insurance rates to the hazards of specific industries and specific establishments tends to industrial safety by bringing home to employers the cost of work injuries and the value of preventive measures.¹¹ Above all, a direct proportion of premium to hazard is felt to be inherently equitable. The principle that each industry should bear its own compensation cost has passed into a canon of social justice and is accepted by employers and underwriters alike as an article of faith.¹² If the insurance

rate for a particular industry is shown to be disproportionately high in relation to the specific compensation cost of such industry the pressure for reduction becomes irresistible whereas the contrary showing is regarded as conclusive by employers themselves. Such being the currently accepted norm, all insurers—competitive or monopolistic, public or private—are obliged to construct a schedule or risk classes with premium rates which are at least ostensibly proportionate to the hazards of the several classes. The system of risk classification thereby becomes the corner stone of the rate structure.

A risk class¹³ for compensation insurance purposes, should satisfy three criteria: (a) The class should be broad enough to develop a dependable experience for rate making. The implications of this requirement will be more fully discussed in a subsequent paragraph; here it will suffice to say that no class ought to contain fewer than ten thousand employees, (b) The class should be reasonably homogeneous in respect to hazard. This amounts to saying that the several establishments and parts of establishments comprised in the same class should be broadly similar in point of materials, equipment, process and personnel. Similarity in these respects will ordinarily be found within the same industry, since it is just these features that serve to differentiate one industry from another. But not every product known to the retail trade by a distinctive name is ascribable to a distinctive industry. The same processes and the same mechanical equipment are employed in the production of a wide variety of finished goods. The processes of moulding, forging, stamping and machining are essentially the same whether the product be an automobile, a turret lathe or a piece of ordnance. So much is this the case that a single **plant** will turn out a long list of related products and may,

without excessive cost, be converted to widely different uses within the same broad industry lines. Projectiles were made during the war, by rolling mills, machine shops, bolt and nut works, and typewriter factories; and breweries have been converted, since the Volstead Act, to candy making, ice cream manufacturing and the bottling of soft drinks. Still more protean and interchangeable are the processes and products of the chemical industry. The number of fundamentally distinct industries is, in fact, relatively small, whereas the number of specific commodities is indefinitely great. A product classification of industries will yield thousands of separate classes of which many will overlap and few will comprise a sufficient exposure for rate making.¹⁴ A classification which looks to the more fundamental features of process, equipment and materials will establish, at most, one or two hundred risk classes, each clearly defined and of sufficient magnitude to develop a stable experience. (c) Risk classes should conform as far as possible to the actual organization of business and industry. Classes which run across the lines recognized by the current organization of industry or which split up a single business establishment into several components at different premium rates tend inevitably to unfair discrimination between competing employers and to confusion of the statistical experience from which premium rates are derived.

The foregoing criteria will be most nearly satisfied by a risk class which describes a distinctive industry and which applies, so far as practicable, to business establishments as a whole. The employer's business is necessarily the unit of insurance, since it is the employer who buys the insurance and pays the premium. In so far as the employer's business is confined to a single industry, the establishment hazards will be characteristic of that industry, whereas the hazards

of occupational or departmental subdivisions will not be characteristic of the like occupations in other industries or the like departments when conducted as separate businesses. The bricklayers, pipefitters, and millwrights of an open-hearth steel mill, a by-product coke plant or a coal mine are exposed to the hazards of steel making, coke manufacturing or coal mining rather than hazards characteristic of the building trades. The rolling department of a fully developed steel plant which starts with iron ore and turns out a wide range of finished and semi-finished products is very different in equipment and in the occupational distribution of employees from an independent tube or bar mill. Steel making is essentially a continuous process. The output of one department becomes the raw material of the next, the same industrial cars and overhead cranes run from one department to another and the same maintenance gang is employed in every part of the plant. To treat the several departments of such an integrated establishment as if they were independent enterprises and to combine the experience derived therefrom with the experience of separate blast furnaces, rolling mills and machine shops is to disregard the actual organization of the industry and to erect risk classes which are essentially wanting in homogeneity.¹⁵

The splitting up of a business establishment into several risk classes is unfortunate in three respects: (a) The risk classes so obtained are apt to be atypical. The currying of leather in a harness factory, the making of acid at a paper mill and the generation of electricity at a coal mine have little resemblance to the businesses of tanning, acid manufacturing or electric utility operation. At the same time these ancillary operations are commonly incident to the industries in which they occur and the number of employees engaged therein is so comparatively small that their inclu-

sion will not appreciably disturb the industry's experience.¹⁶

(b) The application of widely different premium rates to the several components of the same business enterprise tempts both employers and competing insurers to juggle payrolls between higher and lower rated departments with resultant gross discrimination in premium rates. Even apart from intentional manipulation a correct division of payroll by insurance risk classes is very difficult to obtain. Departmental organization varies from one establishment to another, and every large establishment has many employees who are common to several departments. To take a typical instance, in a plant which manufactures heavy machinery the power and maintenance employees, the train crews and many of the hand truckers and crane operators will serve the steel foundry, the gray iron foundry and the machine shop in such a way that their payroll can be distributed to these several departments only by some arbitrary scheme of allocation,

(c) The correct assignment of industrial injuries to separate risk classes in the same establishment transcends the statistical competence of any extant insurance carrier, American or foreign, state or private. To decide whether a particular accident—say the dropping of a crane load—should be ascribed to the steel foundry or the machine shop of a given plant, the statistician must know the precise manner in which the accident occurred, the occupation of the injured, the department in which he was employed and what he was doing at the moment, and must have a fair acquaintance with the machinery building industry. These requirements might be met by insistence upon detailed reporting of accidents and upon appropriate training of statisticians. In practice, however, accident reports are often deficient in the requisite detail and the claim adjusters and statistical clerks who

assign the accidents to insurance risk classes are lamentably ignorant of industry.¹⁷ For all these reasons, the statistical experience obtained by payroll division is utterly unreliable. The payrolls and losses reported for retail stores in connection with bakeshops, for machinery manufacturing or boiler making in shipyards, or for carpentry, concrete construction and landscape gardening in connection with railway maintenance, serve only to mislead the unwary.¹⁸

In mining, manufacturing, merchandizing and utility operation all the components of any one establishment will ordinarily be incident to the same industry and may properly be included in the same risk class. No useful purpose is served by payroll division as between logging and saw milling, brick making and clay digging, railway operation and railway shops, bakers and bakery drivers, school teachers and school janitors, or office and plant employees. The same business enterprise may of course, transcend the limits of a single industry, but this is not to say that meat packing and tanning, steel making and coal mining or automobile manufacturing and railway transportation will be conducted in the same establishment or that the establishment risk classes will be essentially blurred by the facts of ownership. The establishment unit and the industry class will, with few exceptions or qualifications, apply alike to small and to large employers.

Even in the building industry the employer's business can ordinarily be comprised in a single risk class. The small building contractor usually is a specialist. His business is carpentry, masonry, plumbing, painting or sheet metal work and any task which he may undertake outside of his usual line will be incidental and subordinate. Railroad and highway construction, including pipe laying and bridge building, are also specialized, in that the contractors who

perform this work rarely undertake to erect buildings. Large erectors are more diversified and it is customary to sub-divide their payrolls into many risk classes following the alleged occupations of employees. But occupational distinctions tend to disappear in the building trades as in other industries. Skilled craftsmen form but a small percentage of the employees of any large erector. The same gang of common laborers handle steel, stone, wood, earth and concrete. Excavation, iron erection and concrete pouring are carried on simultaneously and employees and equipment are so commingled that any distribution of payroll or accidents as among these several operations is wholly arbitrary. It seems probable on these grounds that a single risk class for building erection by general contractors would be more satisfactory than the attempt to subdivide the business of these contractors by kinds of construction or by gangs of employees.

Whatever the scheme of risk classification, premium rates are to be derived from the statistical experience of each class. Under the full reserve plan premium rates are fixed in advance of the insurance year and are based upon the expected cost of industrial injuries. The assumption which underlies such prospective rate making is that the frequency and severity distribution of injuries within the same risk class will be reasonably constant from year to year. The pure premium or injury cost per unit of payroll which has been developed by past experience is projected into the future and this projection involves the expectation of a definite number and cost of deaths, of permanent disabilities and of temporary disabilities per thousand employees per annum. Evidently such an expectation will be dependable only in the degree that it is founded upon a broad and fairly homogeneous experience. Pure premiums

under any adequate scale of benefits will be mainly governed by the occurrence of deaths and permanent disabilities. But deaths and permanent disabilities are comparatively rare even in the most hazardous occupations¹⁹ in so much that to determine the frequency of fatal and permanent injuries requires an exposure of several thousand employees over a series of years. The compensation cost of these injuries is, moreover, extremely variable. The cost of deaths varies with the number and ages of dependents, as well as with the wages of the deceased, and the cost of permanent disabilities varies with the severity of injury and the age and wage of the injured. Age, wage, dependency and the severity distribution of injuries all differ from one industry to another²⁰ and a large number of occurrences must be observed in each industry to obtain a stable average. The volume of exposure—number of employees or amount of payroll—required to establish the frequency and cost of fatal and permanent injuries will vary inversely with occupational hazard but cannot well be less than ten thousand employee years nor comprise fewer than one thousand compensable injuries. The higher the scale of benefits, the larger must be the exposure because the greater is the possible disturbancy by reason of a single injury. As a rough test it may be said that the exposure, in terms of total compensation losses, should be so great that no single accident will affect the pure premium by more than one per cent.²¹

Mere volume of exposure, however large, is insufficient for rate making unless the experience covers a series of years. The frequency of fatal and permanent injuries in the same occupation varies in an unpredictable manner from year to year,²² the relative proportion of married and unmarried men is affected by the ebb and flow of immigra-

tion,²³ and the cost of temporary disabilities per unit of payroll fluctuates with business prosperity and depression.²⁴ Probably a five-year cycle will smooth out these chance fluctuations. A five-year period will ordinarily include an era of rising and an era of falling prices, of prosperity and depression, of rapid and retarded immigration. The use of a five-year period has the further advantage of spreading insurance profit and loss over a considerable interval. Insurance is emphatically a long run business. Prospective premium rates can never be made with meticulous accuracy for a single year. But it should be possible by combining the experience of a series of years to obtain a rate level which, in the long run, will prove both adequate and reasonable.

An insufficient exposure may be enlarged either by extension in time or by grouping the experience of several jurisdictions or of several risk classes. All these makeshifts are subject to sharp and decisive limitations. Industrial processes and equipment change so rapidly that an experience ten years old is already obsolete. Risk classes that are really distinct cannot be combined for rate making but may be grouped for certain ancillary purposes. If, for instance, it is known that wage rates and dependency distribution in several risk classes are fairly uniform these classes may be taken together for the purpose of arriving at the average cost of fatal injuries. Catastrophe pure premiums must also often be derived from the combined statistics of many industries. Lastly, experience had in one state may be supplemented by experience drawn from other states. State lines, indeed, are significant for compensation insurance only in so far as the scale of benefits, the degree and character of insurance supervision, the system of risk classification and the technological features of

industry itself differ from state to state. It so happens, however, that the benefit scales of the several United States are utterly disparate,²⁵ that the supervision of compensation insurance is rigorous in certain states and totally absent in others, that nominally identical risk classes are far from uniform in content and application, and that such industries as coal mining, logging and lumbering, paper making and iron and steel manufacturing differ radically from one section of the country to another in the scope and scale of individual establishments, in methods of work, and in inherent hazard. In view of these diversities what is called country-wide experience, however combined into a total, is more likely to mislead than to inform.²⁶ Yet for small states there is no other means of obtaining an adequate exposure for rate making.

Breadth of exposure, even in a large industrial community, is only obtained by inclusive risk classes. The establishments comprised in the same class will, therefore, vary appreciably in scope and scale, in equipment and process, in the occupational distribution of employees and in other features which affect industrial hazard. One stone quarry is worked in successive benches, another from a single level; one turns out crushed stone with a minimum of manufacturing process, another produces glass sand or architectural slate. Some woolen manufacturers generate their own power, others buy electric current from a public utility corporation; some scour and comb their own wool while others start from tops; some dye and finish their product, others sell unfinished goods. Differences of this sort run through every industry and their name is legion. To take account of these variations by way of risk classes would produce almost as many classes as there are individual establishments. Yet some account must be taken of

varying hazards within the same risk class, at least by competitive insurers, if only to avoid an adverse selection of risks. Elaborate schemes of individual risk²⁷ rating have been devised for this purpose. The premium rate developed by the class experience thereby becomes simply a basis or average rate and the effective rate of the particular establishment is obtained by applying debits and credits to the basis or class rate after the manner familiar in fire insurance practice. Two forms of risk rating are in general use: "schedule rating," which attempts to measure the tangible hazards of the risk in comparison with some stated norm for the class, and "experience rating" which modifies the class rate up or down in accordance with the favorable or adverse experience of the particular employer. Schedule rating will evidently be useful for other than competitive purposes in the degree that the credit and debit items of the schedule are statistically sound. If based upon a thorough analysis of tangible hazards the rating schedule may be made a very useful means both of refining risk classes and of promoting industrial safety.²⁸ Less can be said for experience rating. The same facts which demand a broad exposure for risk classes go to say that the experience of a single risk will be highly unstable. A machine shop which employs one hundred men has an expectancy of one death in twenty years, and of one major permanent disability in fifteen years. A cement mill which employs one thousand men should normally experience six deaths and four major permanents in five years. Obviously where the total expected number of occurrences does not exceed ten a deviation from the class expectancy signifies nothing as to the probable future experience of the risk.²⁹ It is only as the single risk approaches the magnitude required for a self-contained risk class that the risk experience can be

made the basis of rational prediction. For all **but** the very largest employers experience rating produces charges and credits which have no relationship to the probabilities of compensation cost. If a high credibility is assigned to the experience of small employers and deaths and permanent disabilities are taken at full value, a single accident may double the premium rate for a term of years or, vice versa, a substantial credit may be given for the non-occurrence of a severe injury in an exposure which corresponds to a total expectancy of one-tenth of such injury.³⁰ If deaths and permanent disabilities be disregarded charges will be obtained upon favorable loss ratios and credits upon loss ratios which exceed one hundred per cent of premium.³¹ If, lastly, the weight given to the experience of the individual risk be strictly proportionate to the adequacy of exposure the experience rating of ninety and nine risks out of every hundred will have no effect.³² Experience rating, in short, is chiefly valuable as a competitive sales argument.³³

The problems thus far considered—security, risk distribution, risk classification, rate making and establishment rating—will all arise under every type of insurance organization. The several types of insurers, however, differ among themselves in their detailed solutions of these problems, in their costs of operation and in their relationship to insureds and to the general public. In point of management, insurance carriers are either public or private; as respects their clientele they are either competitive or monopolistic. Insurance monopolies are usually managed by the state as in Norway, Ohio, Ontario, Oregon, Washington and West Virginia,³⁴ but may be vested in employers' mutual associations, as in Germany. Competitive insurers are of many types—stock companies, mutual associations, reciprocals and competing state funds. Stock companies are

capitalistic business enterprises which sell insurance at a pre-determined maximum price, assuming the risk of loss and reaping the profit of excessive premiums. Policyholders in stock companies have neither a voice in the management nor a share in the profits.³⁵ Mutuals, reciprocals³⁶ and state funds are ostensibly managed by or on behalf of their subscribers; the subscribers may or may not be liable to assessment³⁷ in case of deficit but they invariably are entitled to participate in the profits of the business. The respective advantages and defects of these several forms of insurance—state monopoly, state competitive, private stock and private mutual—are debated with much passion by advocates whose zeal in the public good is sharpened by pecuniary interest.³⁸ Spurious arguments drawn from irrelevant social theories are made to do yeomen duty in the cause of propaganda and the pertinent facts are obscured by the dust of controversy. It is peculiarly important, therefore, to examine the rival types of compensation insurers in the light of their actual performance.

Monopolistic insurers have an obvious advantage in economy of operation. Selling costs, the grand extravagance of competitive insurers, are wholly eliminated. Lesser savings are effected in policy issuance, claim adjustments and plant inspection. A single staff of adjusters and inspectors, properly districted, cover the state more effectually and with far less traveling expense than a much larger corps employed in severalty by competing insurers. The elaborate policy form still thought necessary by commercial insurers can be replaced by a very simple certificate which recites only the employer's name and address and the risk class or classes to which his business is assigned, with the corresponding premium rates. The ex-

pensive nuisances of cancellations and "policies not taken," incident to business twisting, are avoided. Even in the home office, the number of high salaried officials and of clerks, accountants and statisticians required to transact a given volume of business is much less for one insurer than for forty. The actual operating expenses of insurance monopolies everywhere bear out these theoretical economies. The German mutuals, under the Imperial régime, expended for all purposes of management about fifteen per cent of the benefits paid to workmen;³⁹ the monopolistic state funds of the United States, Canada and Europe have maintained expense ratios of five to ten per cent of compensation benefits.⁴⁰ The extreme showing of economy made by many American state funds has been secured at some sacrifice of efficiency. Salaries are too low to retain competent employees, the staffs are too small for the work to be done, claim payments are needlessly delayed, accident prevention is neglected and statistical information of great social value is withheld,⁴¹ But a really efficient administration of a large insurance monopoly would certainly not cost more than ten to fifteen per cent of benefits under an adequate scale.

Competitive insurance is, in comparison with the results attained by monopoly, admittedly wasteful. Selling costs alone, in the United States, absorb seventeen and one-half per cent of stock company premiums. Home office salaries and expenses add another ten per cent, claim adjustment, plant inspection, taxes and the expenses of rating bureaus bring the total to thirty-five or even forty per cent.⁴² Mutuals and competing state funds, which rely upon dividends as their most potent selling argument, show an expense ratio of fifteen to twenty per cent of gross premiums. Translated into terms of benefits, it costs not less

than sixty cents to cany one dollar of compensation to injured workmen and their dependents through the medium of stock company insurance and not less than twenty-five cents to pay one dollar of compensation through competitive mutuals.⁴³ It would appear then, that stock company insurance is four times as expensive as monopolistic insurance and more than twice as expensive as competitive mutual insurance.

Much of the waste exhibited in contemporary American and British practice can be eliminated without suppressing competition. Wherever insurance is compulsory, agents' commissions can well be limited to ten per cent.⁴⁴ Claim adjustment under a liberal scale of benefits and with efficient administrative supervision need not cost more than three per cent of the premiums of any large insurance carrier. Other expenses properly chargeable to compensation insurance, including two per cent for taxes, should not exceed twelve per cent. In short, twenty-five per cent of premiums under an adequate scale of benefits should be a sufficient expense provision for stock companies.⁴⁵ The net premium rate per dollar of compensation would thus stand at \$1.35 for stock company insurance in comparison with \$1.10 to \$1.15 for monopolistic insurers and \$1.15 to \$1.20 for competitive mutuals. No such drastic curtailment of expenses is to be looked for through the voluntary action of insurance carriers. The companies are far too dependent upon brokers and agents to reduce commissions, even by concerted effort. Other costs are obscured by multiple line accountancy⁴⁶ and are bound up with competition for automobile and public liability insurance in such a way that no one company can greatly reduce its overhead without affecting its competitive position. Only public regulative authority can bring about the needed

reform. It is a reform which should interest every advocate of competitive insurance if only because the excessive cost of competition under existing conditions is a persuasive argument in favor of monopoly.

In the all-important matter of security, again, monopoly has a manifest advantage. The conditions of solvency for a monopolistic insurer are few and simple: unlimited power of assessment and a normal premium income of reasonable magnitude. In any jurisdiction which contains 500,000 wage workers subject to compensation an absolute insurance monopoly can maintain itself indefinitely without ever resorting to an exorbitant levy. The adequacy of reserves is immaterial except as it affects the level of rates.⁴⁷ Far otherwise is the case of competitive insurers. Stock companies expressly renounce any right of assessment and the assessment power of competitive mutuals is narrowly limited by law and custom.⁴⁸ Any resort to assessment, indeed, usually terminates the career of the offending mutual.⁴⁹ Adequate reserves, accordingly, are indispensable to the continued solvency of any compensation insurer which falls short of complete monopoly. But reserves must be accumulated out of premiums and competition tends to impair premiums, directly by rate cutting and indirectly by extravagant selling costs. The temptation to bid for business by lower rates, higher commissions and larger dividends is ever present and the day of reckoning is long postponed. The liabilities incurred in a single year run far into the future so that a fraction of the full reserve will suffice for several years to meet the payments actually accruing. Disbursements on account of past injuries may even be met out of current receipts until the slowly accumulating payments overtake the premium income. The higher the benefits for death and permanent disability the longer is the

time during which insurance carriers may demoralize their rates and waste their substance in fancy salesmanship. The danger is aggravated by the uncertainties which still surround compensation reserves. Underestimate of outstanding liabilities is easy and, in the absence of rigid rules, all but universal. Permanent disabilities are rarely diagnosed as such within one year of accident occurrence. Physicians and claim adjusters are incurable optimists. Broken backs and dislocated vertebrae are habitually reported as sprains and a depressed fracture of the skull is not infrequently described as a scalp wound. Injuries which appear trivial at the time of occurrence result in death or permanent disability by reason of infection, cases regarded as without the scope of compensation prove to be compensable, dependents appear two years after a death and claims are allowed for injuries which the employers had omitted to report and for medical services rendered months before. Well managed insurance companies allow for these contingencies and strive to maintain adequate rates as well as adequate reserves. But not all insurers are well managed and the weakest competitor sets the pace in lowering rates and raising commissions. Failures of competitive insurers, stock and mutual, have been numerous even under the low benefit scales current in the United States;⁵⁰ under an adequate scale of benefits insolvency would be much more frequent.

Next to certainty of ultimate payment, social interest demands the prompt and equitable adjustment of claims. Here also *a priori* reasoning would seem to favor an insurance monopoly under state management. The motives of competitive pressure and of private profit which conduce to short-changing, delay and litigation on the part of commercial insurers are removed by state monopoly. Public

officials charged with the administration of a workmen's insurance fund might be expected to apply the law in a liberal spirit and to make prompt payment a point of conscience. In actual performance, however, there is little to choose in these respects between state and private insurance. Illiberal settlements, narrow definitions of industrial injury and the denial of compensation on technical grounds appear to be as prevalent in Washington and West Virginia as in New Jersey and Alabama;⁶¹ the adjustment of claims is as disgracefully tardy in Ohio as in Pennsylvania.⁵² The actual administrators of state funds are too apt to regard themselves as trustees for the insureds rather than the beneficiaries and to look to low premium rates rather than liberal settlements as the goal of endeavor. Claim adjusters, by whomever employed and whatever their antecedents, take to claim shaving as sparks fly upward. Even the liberally minded Industrial Commission of Ohio developed a needlessly elaborate claim procedure and permitted its claim division to suspend payment in hundreds of cases of continued disability.⁵³ Apart, moreover, from predilection and from procedural complication, the staffs of our monopolistic state funds are universally under-manned. Prompt investigation of claims and the making of initial payments when due would cost at least twice the sum devoted to that purpose in Ohio, Washington or West Virginia. It is not meant to imply that the record of state insurance funds in the treatment of claimants is worse than that of private insurance companies. The Industrial Commission of Ohio and the Workmen's Compensation Board of Ontario have been notably liberal in their final adjudication of claims, just as some private companies are distinguished for prompt, liberal and non-litigious settlements. But state

monopoly is no guarantee of efficient and equitable claim adjustment.

The root causes of ineffective claim administration by monopolistic state funds are two: insufficient appropriations and the vesting of insurance management in the very same commission which has to pass upon disputes between the insurer and its claimants. As managers of the fund the commissioners and their subordinates owe an obvious duty to insured employers; in their capacity of adjudicators they are bound to apply the law impartially against themselves. The whole procedure smacks too much of allowing one of the parties in interest to act as judge of the dispute. It is much to their credit that many commissioners have discharged these dual functions without incurring reproach, but the functions are at best incompatible. The actual management of compensation insurance whether public or private, competitive or monopolistic, ought to be divorced from the supervision of claim settlement. For the evil of insufficient appropriations the most certain remedy is to charge the maintenance of the fund against its premium income and to relieve its budget from legislative control. No valid reasons of public policy require that any part of the expenses of compensation insurance shall be paid from the general revenues of the commonwealth.

In risk classification, in rate making and in accident prevention the monopolistic state funds have made little use of their rich opportunities. The rate manuals of Ohio, Washington and West Virginia—to cite only conspicuous examples—are full of arbitrary groupings, minute subdivisions of a single industry and unwarranted discriminations between establishments of identical hazard. Premium rates are based upon capitalized reserves and embody the theory that each industry class should bear its own costs,

but the industry classes are so split up and the system of **rate** making is so crude as to produce violent fluctuation by the chance distribution of costly accidents. Experience rating is so applied as to give extreme deviations from the class rate upon an exposure too small to possess any actuarial value.⁵⁴ In West Virginia the individual employer is even held to pay his own accident cost, exclusive of catastrophe and over and above a fixed minimum. Monopolistic insurance as thus applied is the very negation of risk distribution. None of the monopolistic funds has done much in the way of systematic plant inspection or applied schedule rating as an adjunct to industrial safety. Yet it would be easier for an insurance monopoly than for competing insurers to work out a well founded system of industry classification, of rate making and of risk rating. The comprehensive failure of the exclusive state funds in these particulars betrays an all round inefficiency.

A form of monopoly not tried in this country but promising upon theoretic grounds is the compulsory employers' mutual after the German pattern.⁵⁵ A monopolistic mutual would retain all the advantages of a compulsory state fund in low operating costs and absolute security while it would be free from that political spoilsmanship which has greatly handicapped the management of state insurance funds. The insured employers would be able to insist upon efficient conduct of the business and would probably be willing to pay for efficient service. They would have, also, a mutual interest in reducing the number and severity of industrial injuries and the means of enforcing compliance with safety standards. The management of the mutual monopoly would be completely separate from the administrative arm of the state charged with the supervision of compensation. That this type of insurance organization is workable and

efficient is abundantly proven by a half century of German experience. But the success of the German mutuals has been largely due to the active participation of employers in their management and the fact that no demand exists in this country for a trial of the plan augurs a lack of such interest on the part of American employers as would warrant the experiment.

The outcome of this inquiry into the several forms of compensation insurance goes to show that the proved advantages of monopoly are limited to economy and security. In equity and promptitude of claim settlement, in the prevention of industrial injuries and in the adjustment of premium rates to hazards, the record of compulsory state funds is certainly not better than that of their commercial rivals. The difference in security alone would be decisive were it not possible to obtain equal security through administrative supervision of private insurance carriers. The abiding advantage of monopoly thus reduces itself to a question of cost alone. Even the difference in cost may be greatly narrowed by administrative control of insurance rates. Cost no doubt is an important consideration but it primarily concerns employers and employers may be adjudged competent to make their own selection of insurance carriers at their own charges. Those who so elect can obtain mutual insurance at net premium rates but little greater than the charge which must be made by an insurance monopoly for equal security and equal service; those who prefer stock company insurance and are willing to pay the price need not be denied that privilege. If state monopoly made for more efficient administration of the compensation system or for more liberal treatment of claimants or if any saving in insurance costs inured to workmen in the way of higher benefits⁵⁶ the friends of compensa-

tion should insist upon monopoly. But none of these claims is substantiated by actual performance. New York couples competitive insurance with the highest benefits in the United States; West Virginia unites monopoly with one of the lowest scales extant. The standards of claim adjustment and of compensation administration at large are apparently higher in New York and Massachusetts, under competitive insurance, than in most of the monopolistic insurance states. The social ends of workmen's compensation can, in fact, be attained under any type of insurance organization. The quality and scope of administrative supervision are vastly more important to the efficient working of the compensation system than the particular scheme of insurance in vogue.

Since insurance is necessary to secure the public ends for which compensation laws are enacted, since the cost of insurance must ultimately be paid by the public at large and since insurance carriers are agencies authorized by law for the carrying out of the legislative purpose, private insurers of compensation liability are rightly subjected to supervision in the public interest. The objects of such supervision are: (1) to maintain the solvency of insurance carriers to the end that future payments of compensation may be secure, (2) to enforce the settlement of claims in accordance with the intent of the statute, (3) to protect employers against excessive premium charges and (4) to prevent unfair discrimination between insureds. Claim administration was discussed at length in a preceding chapter. The remaining objects of insurance supervision are comprised in rates and reserves.

Adequate reserves for compensation liabilities must be based upon individual claim valuation.⁵⁷ For life pensions and other long term annuities the existing actuarial tables

may not be altogether appropriate, but it is easy to select a combination of tables which will produce reserves of unquestionable adequacy. Death cases of doubtful, disputed or unknown dependency, cases of disputed liability and recent disabilities of unascertained severity or duration, can readily be valued upon an "indeterminate table" derived from actual statistical experience.⁵⁸ Medical reserves can be safely taken at a flat percentage of the amount paid during the last year on account of current injuries.⁵⁹ Unreported claims should be covered by a small contingent loading.⁶⁰ Lastly, as a general minimum, the carrier should be required to hold at least the normal expected loss ratio of premiums earned during the two last preceding years. The reserves so set up should be clearly segregated from other liabilities of the same insurance carrier and dedicated solely to the payment of compensation benefits. Compensation insurers commonly transact a general casualty business. Reserves for other casualty lines—automobile, public liability, burglary, plate glass and what not—are hardly susceptible of actuarial determination nor do they possess at all the same social significance as compensation reserves. The funds held for the payment of compensation claims ought not to be jeopardized by inadequate rates or reserves in unrelated branches of commercial insurance. Compensation reserves must, of course, be computed by states and under the supervision of state officials. The readiest and most effective means of segregation, therefore, is to require the deposit in each state of securities sufficient to cover all liabilities outstanding in that state as ascertained by the supervisory authority. This requirement might work some slight inconvenience in the collection of interest and the making of re-investments but would cause no real hardship to an insurer

which has a substantial premium income in the particular state. Any inconvenience to carriers would be more than offset by the advantage to insurants and beneficiaries of keeping reserves within the reach of attachment. Compensation claimants in Pennsylvania ought not to be subjected to the tedious processes of receivership and the risk of ultimate loss because some insurance carrier in Iowa or Utah has been mismanaged.⁶¹ Finally, over and above all reserves, the standard of solvency should include an adequate surplus. Not less than \$1,000,000 and not less than twenty-five per cent of the annual premium income would be a moderate standard.

Rate supervision should be directed to the maintenance of premium rates which are adequate, reasonable and non-discriminatory. These canons of adequacy, reasonableness and non-discrimination are the same for compensation insurance as for other businesses under private management but affected with a public interest. Adequate rates conserve the interests of beneficiaries in that sufficient reserves cannot, in the long run, be maintained out of insufficient premiums.⁶² Reasonable rates imply that the premiums charged for compensation insurance shall not exceed the necessary cost of providing sound protection and efficient service by competitive insurers. Non-discrimination requires equal charges to all insurants for equal hazards and equal services. Competition tends to inadequate rates for reasons and in ways already spoken of. The opposite tendency to excessive charges arises partly from competitive selling costs and partly from understandings among leading insurance carriers.⁶³ Under conditions of unrestricted competition, indeed, "tariff" or "bureau" companies may seek to maintain excessive rates side by side with unduly low rates on the part of non-bureau com-

panies.⁶⁴ The same exigencies which induce competitive rate cutting lead to unfair discrimination between insureds. All salesmanship consists in charging what the traffic will bear. What the traffic will bear insurance-wise depends upon the keenness of competition for the particular risk and upon the buyer's knowledge and bargaining power. Advantage in these respects habitually inures to the large purchasers of insurance as to the large railway shipper or the large user of electric power. Discrimination takes many forms—direct rate concessions, split commissions, medical contracts,⁶⁵ mis-classification of risks, mis-audit of payrolls and schedule or experience credits not warranted by the facts.⁶⁶

Regulation which seeks to restrain competitive abuses and extravagance without abolishing competition must control total premium rates, total expense loading, acquisition or selling costs and the classification and rating of individual risks. The administrative authority should determine the reasonable and adequate rate for each risk class and enforce the observance thereof by all carriers, leaving participating insurers free to return to their policyholders in the form of premium dividends any savings which they may severally effect in losses and expenses. The fixing of reasonable rates necessarily involves the determination of reasonable commissions and reasonable management expenses. There is little danger that the officially established rates will often be exceeded under conditions of active competition. It will remain to guard against the competitive bidding up of costs, competitive rate cutting and competitive discrimination between insureds. Operating and selling costs are easily controlled by refusing to license any insurer which persistently exceeds the established expense ratio. Reasonable rates and adequate

reserves will of themselves go far to prevent rate cutting—a reasonable rate level leaves little margin for premium impairment and reserves actually set aside are a sharp reminder of insufficient income. But supervision must be extended beyond class rates to the rating of individual risks if it is to prevent discrimination.

The processes of rate making and of risk classification and rating require close co-operation between insurers and the administrative authority charged with the supervision of insurance. The most effective agency yet devised for this purpose is the compulsory rating bureau operated by insurance carriers under public supervision.⁶⁷ The function of such a bureau should be to establish risk classes, premium rates and rating plans, to compile statistical experience for these purposes, apply schedule and experience rating and determine the class or classes applicable to each insured establishment. To enforce compliance with bureau ratings copies of the actual policies should be filed with the bureau and payroll audits should be reported by individual risks. The work of inspecting, rating and classifying risks, scrutinizing policies, compiling statistics and investigating industrial processes for the purpose of erecting risk classes and devising rating plans will necessarily devolve upon the paid staff of the bureau; only the formal establishment of risk classes and class rates should be vested in representative committees of the carriers. All acts of the bureau will of course be subject to approval or disapproval by the administrative department of the state which has jurisdiction thereover. That this power may be intelligently exercised, the administrative authority should be represented at all deliberations of bureau committees and should be intimately acquainted with the bureau's operations and with the statistics from which rates are derived.

By this means friction between the carriers and the supervisory authority will be minimized and the public interest will be protected to the degree that the supervisory authority itself is alert and informed therein.⁶⁸

The supervision of compensation insurance should unquestionably be vested in the board, commission or department which administers the compensation law. Insurance is so intimately related to claim settlement and claim adjudication, the security of annuity payments provided by insurance reserves is so vital to the success of the compensation system and intimate contact with employers and workingmen is so essential to an understanding of the problems to be dealt with that administrative control of compensation insurance cannot well be divorced from other phases of compensation administration. Insurance departments as currently organized are concerned rather with fire, life, marine and casualty insurance as commercial businesses than with social insurance as such; they have neither the industrial knowledge and contact nor the social viewpoint necessary to supervise workingmen's insurance in the interest both of employers and of beneficiaries.⁶⁹ Compensation commissioners are more apt to be socially minded and they have far more opportunities to acquire the requisite knowledge both of industrial organization and of the actual working of compensation insurance. The compensation department, moreover, has in its records all the data needed for the compilation of authentic statistics of industrial injuries and for setting up reserves, whereas the insurance department is necessarily dependent for both purposes upon the reports of insurance carriers.⁷⁰ Whatever the ultimate authority, effective supervision will mainly depend upon a trained staff of statisticians, actuaries and examiners. The work to be done is technical and the

technical employees of the state, if supervision is to achieve its purpose, must be fully equal in ability and experience to the technicians of insurance carriers. Most of our state departments, whatever their nominal functions, are lamentably deficient in this respect but the chance of obtaining competent subordinates is about equally good or equally bad in one department as another. Assuming that personnel will be much the same in any case, unity of function ought to decide administrative organization. The several problems of workmen's compensation, from the reporting of injuries and the adjustment of claims to the licensing of insurance carriers, the regulation of rates and the setting up of reserves, so hang together that all should center in a single administrative body.

Insurance supervision of the thorough-going sort herein outlined restricts competition to salesmanship, service and net cost. Risk classes, premium rates and rating plans are established by public authority upon the basis of statistics compiled under governmental supervision; reserves are set aside by the same authority, invested in securities prescribed by law and kept in legally designated depositories; risk rating is performed by a quasi-public rating bureau which is held to strict impartiality as among insurance carriers. Even the commissions which may be paid to agents and the dividends which may be returned to policyholders are regulated by the state. Whether competition so straitened and bound retains the advantages which its admirers are wont to claim for the competitive system is perhaps an open question. But certain it is that competitive insurance will not serve the public ends of workmen's compensation unless subjected to rigorous and far reaching regulation.⁷¹ Subject, however, to such regulation as will conserve the public interest the state may well allow each employer to

elect his own insurer, whether joint-stock or mutual, or—if he have the necessary resources—to provide his own establishment fund for the security of compensation payments. Such establishment funds are, in effect, insurance carriers and should be subject to the same supervision as other insurers in respect to claim settlement and claim reserves.

NOTES

¹ On the shifting of compensation cost see Ch. I, Note 30.

² Most of the material on the German Employers' Insurance Association readily accessible to American students is old—the *Twenty-fourth Annual Report of the U. S. Commissioner of Labor*, Rubinow's *Social Insurance* and Frankel and Dawson's *Workingmen's Insurance in Europe*. The very abundant and instructive German experience has, in fact, counted little in the development of the American Compensation system. See, however, the supplements to *Amtliche Nachrichten des Reichsversicherung samtes*, and *Reichsarbeitsblatt des Staat*.

³ Assessments being mainly controlled by accumulated rather than currently incurred costs, the assessment rate per unit of payroll will vary more than the total amount, rising in periods of depression and falling in periods of business prosperity. Reasonably stable rates can be maintained by the use of a surplus.

⁴ Cf. Rubinow, *Social Insurance*, pp. 147-8.

⁵ American actuaries and underwriters often cite the analogy of assessment life insurance. But the analogy is false in that the assessment fraternal is purely voluntary.

⁶ The West Virginia State Fund during the first years of its operation was limited to a maximum rate of one per cent of payroll. This rate proved to be (and indeed was designed to be) utterly inadequate for the state's chief industry—bituminous coal mining. The limit was subsequently removed and the deficit accumulated thereunder has since been made good.

The Washington State Fund is divided into arbitrary self-contained groups many of which are too small for safety. None of the groups (thanks to a low scale of benefits) has become insolvent but payments on account of a catastrophic accident in the explosives group were suspended for several years pending the outcome of a suit against the DuPont Company.

⁷ The life insurance tables in current use (British and American) are unsuitable to the purpose because ostensibly based upon selected lives and because there is more than a suspicion that these tables exaggerate current mortality. An over-estimate of mortality will produce redundant life insurance reserves, which is the object had in view in the use of these mortality tables, but it will have the reverse effect upon annuity reserves. The Danish Survivorship Annuitant's Table, adopted by the New York Insur-

ance Department for permanent total disability and widows' pensions, has the opposite fault. Danish longevity is exceptionally high and reserves based thereon are doubtless redundant for American working class pensioners. The general population mortality tables issued by the U. S. Census Bureau would be more suitable for compensation reserves than any of the tables now in use.

³ The re-marriage table compiled from the experience of the Dutch Royal Insurance Institute is used in New York and perhaps elsewhere in America. But the Dutch experience is of very limited volume and of more than doubtful applicability to American conditions. See a paper by the writer in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol, 8, pp. 201-211.

⁹ A catastrophe, by the currently accepted definition, is an accident causing five or more deaths or permanent total disabilities. Catastrophies involving a hundred or more deaths, though rare, are a possibility by no means remote in many industries.

¹⁰ Under the conditions supposed no competitive insurer would willingly take any risk of more than average hazard while all would engage in a wild scramble for the insurance of low-hazard industries.

¹¹ For elaboration of this point see *post*, Ch. VI.

¹² The acceptance of this principle as a matter of course has been strongly impressed upon the writer by numerous public hearings upon compensation insurance rates.

¹³ By a curious linguistic error the abstract noun "classification" has come to be used by American casualty underwriters and actuaries in the sense of "class."

¹⁴ Cf. *The Classification of Industries for Compensation Insurance*, in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. I I, p. 10. Since this paper was published, better acquaintance with the actual organization of industries and further experience with the abuses of payroll division have modified the writer's views as to the feasibility of applying risk classes by way of departmental or process sub-divisions of business establishments. But what was said seven years ago in criticism of the then system of risk classifications will apply, in nearly the same degree, to the Basis Manual of 1920.

¹⁵ Such an industry as steel making or coal mining covers a wide range of occupational hazards, from office work to train operation. But the occupations of employees are too multifarious and too unstable ever to develop a dependable experience. Furthermore, unless the occupational distribution varies greatly in different establishments no injustice is done by including all employees in a single risk class at a single rate.

¹⁶ The inclusion of wool scouring and combing, and even of shoddy manufacturing, in wool spinning and weaving did not, in Pennsylvania, affect the pure premium by as much as one per cent. The inclusion in paper manufacturing of the acid, soda, barking and ground wood departments—all supposedly more hazardous—actually *reduced* the reported pure premium for paper making. Even the electric steel making and rolling mill departments

of a large tool manufacturer caused no appreciable disturbance when thrown into the experience of tool manufacturing.

¹⁷ Cf. *The Uses and Abuses of Schedule Z*, published by the National Council on Workmen's Compensation Insurance.

¹⁸ In Pennsylvania only \$345 of losses were assigned to \$734,000 of "boiler making" payroll reported from two ship yards. Of the payroll of a zinc smelter, 25 per cent was assigned to "zinc oxide manufacturing," "acid manufacturing" and "additions and alterations," whereas only 5 per cent of the losses was charged to these subsidiary classes. From open hearth steel mills was obtained a payroll of \$4,471,000 in "additions and alterations," with only \$6,667 of loss. Some 75 railroad contractors developed a payroll of \$30,468,000 and a loss of \$303,739 in four years. The class "railroad construction" contained 50 per cent of this payroll and 81 per cent of the losses, the class "grading land" showed 26 per cent of the total payroll and only 4 per cent of the losses; "Carpentry" in the same experience gave a pure premium of \$.29, "cellar excavation" \$.18, "landscape gardening" \$.003.

¹⁹ See *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1920*, Table VI. Illustrative fatality rates per \$1,000,000 of payroll are: bituminous coal mining, 2.5, quarrying, 3.3, building construction, 1.3, all manufacturing, 0.5, iron foundries, 0.8, machine shops, 0.3, woolen manufacturing, 0.3, office employments, 0.03, iron erection, 4.5.

²⁰ See *Statistical Analysis*, u. s., Tables VI and VIII.

⁸¹ For a luminous discussion of what constitutes an adequate exposure see several papers by Messrs. A. H. Mowbray and Arne Fisher in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. I, p. 24, Vol. II, pp. 70, 124 and 394, Vol. III, p. 43, Vol. IV, p. 263. Mr. Arne Fisher has proposed some very refined mathematical tests of stability but it is doubtful whether these tests will prove of much practical use in compensation insurance. Stability in accident experience is never more than relative, just as the statistics themselves are never exact and the resultant premium rates are never more than approximately accurate. A reasonable degree of stability, or the want of it, in the experience of a series of years will be sufficiently evident upon inspection.

²² The fatality rate per thousand full-time workmen among the 170,000 soft coal miners of Pennsylvania was 2.34 in 1916, 2.71 in 1917, 2.67 in 1918, 2.78 in 1919 and 2.35 in 1920.

²³ The average number of dependents per death among Pennsylvania coal miners was 2.0 in 1916-1917 and 2.5 in the years 1918-1920.

²⁴ See a paper *On the Relation of Accident Frequency to Business Activity* by A. H. Mowbray and S. Bruce Black in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. II, p. 418.

²⁵ See *post*, Ch. VII.

²⁶ For discussion of the technical problems of combining experience see *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. VI, 201, 250. Papers by G. F. Michelbacher and A. H. Mowbray; also a paper by G. C. Kelly and the present writer in Vol. V, pp. 243-273.

²⁷ The word "risk" has come to be used as a concrete noun to denote the risk assumed in the insurance of an individual employer or establishment or even the insured establishment itself.

²⁸ The value of schedule rating for accident prevention will be considered in Ch. VI. For technical aspects of the subject see papers by C. M. Hansen, L. S. Senior, A. H. Mowbray and A. W. Whitney in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. I, by H. M. Wilson in Vol. II, by A. W. Whitney in Vol. VII and by the present writer in Vols. III and IV.

²⁹ On the chance distribution of severe losses in a limited exposure see Arne Fisher, in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. III, p. 43.

³⁰ Just such violent fluctuations in premium rates have characterized the application of experience rating in New York and in other states which use a similar plan. The fluctuations by reason of a single accident are especially extreme in New York owing to the comparatively high scale of benefits. See several statistical reports issued by the Compensation Inspection Rating Board.

³¹ The so-called split plan, by which greater weight is given to temporary disability and medical than to death and permanent disability costs, has in actual practice produced erratic and indefensible results.

³² An adequate exposure in the machine shop class can hardly be taken at less than \$50,000,000 of payroll. Five years' experience of a risk which has an annual payroll of \$100,000 would thus have a theoretical weight of one-tenth of one per cent in the effective premium rate for the risk.

³³ For a technical discussion of experience rating see papers by J. H. Woodward in *Proceedings of the Casualty Actuarial and Statistical Society*, Vol. I I, p. 356, and by A. W. Whitney and G. F. Michelbacher in Vol. IV, pp. 263, 274.

³⁴ Few of the monopolistic state funds are complete monopolies, in that employers are permitted to carry their own risk, if they so elect. See *post*, Ch. VII.

³⁵ Participating stock companies are essentially mutual associations in that the capital stock is treated as a guarantee fund and any earnings over a fixed return upon the paid-in capital accrue to policyholders.

³⁶ The differences between reciprocal and mutual associations are rather technical than substantial.

³⁷ Many mutual associations, participating stock companies and competing state funds issue non-assessable policies.

³⁸ The Workmen's Compensation Publicity Bureau—a propagandist organization maintained by stock insurance companies—has divided its attacks between mutual and state insurance. The state funds and some of the private mutuals have put out a flood of controversial literature. The International Association of Industrial Accident Boards and Commissions has devoted much time to the debate between state and private insurance. Most of this literature is more remarkable for heat than light.

³⁹ *Twenty-fourth Annual Report of the United States Commissioner of Labor*, Vol. I, pp. 1095-1102.

⁴⁰ *Annual Reports* of the Industrial Commission of Ohio, the Workmen's Compensation Board of Ontario and the Industrial Insurance Department of Washington.

The net operating cost of the Ohio State Fund is less than five per cent of premiums, even including the whole cost of claim adjudication. See *Actuarial Audit*, 1919, p. 48.

⁴¹ *Actuarial Audit of the Ohio State Fund*, 1919, pp. 48-52:

Confidential information obtained from insurers and publicists indicate that conditions in all these respects are worse in Washington and West Virginia than in Ohio.

⁴² A typical expense distribution is:

Acquisition	17.5
Home Office	10.0
Claim Adjustment	6.0
Inspection	1.0
Rating Bureau	1.0
Taxes	2.5
Total	38.0

The premium rates of risk classes include, of course, the "expense loading," as well as the pure premium, or actual compensation cost per xmit of payroll. The loading is usually expressed as a percentage of total premium but the rate is computed by applying to the class pure premium a multiplier which contains the loading. Thus the Pennsylvania multiplier of 1.60 answers to an expense loading of 37.5 per cent.

⁴³ An expense ratio of 40 per cent is two-thirds of the expected pure premium. Mutual rates are usually the same or nearly the same as stock company rates so that an expense ratio of 15 per cent of gross premiums would equal 25 per cent of expected losses.

⁴⁴ Cf. Great Britain, *Report of the Departmental Committee* appointed to inquire into the system of compensation for injuries to workmen.

⁴⁵ The gross expense loading recommended by the British Departmental Committee, *u. s.*, is 30 per cent. But the British scale of benefits is very low and the system of claim adjudication is expensive and inefficient.

Investment earnings on capital, reserves and unearned premiums will amply provide for profits, with something over to apply upon expenses. Investment earnings at the present time average 5 per cent of the annual premiums or 25 to 30 per cent on the capital invested.

⁴⁶ Current accounting systems do not furnish a proper segregation of expenses by states or by lines of business. Only commissions and taxes are specific. The same field adjusters and the same home office staff handle compensation, burglary, plate glass, automobile and public liability insurance. Claim and home office expenses are pro-rated to states and to lines of business by amount of premiums. Commissions and taxes being fairly uniform, this method of accounting gives the same apparent expense ratio for high benefit and low benefit states and for the populous eastern com-

mimities as for Colorado or Montana. The same accounting device, in the opinion of the writer, loads the claim and home office cost of compensation with expenses properly chargeable to automobile and public liability lines.

⁴⁷ The American state funds, whether competitive or monopolistic, all operate on the full reserve plan. Most of the monopolistic funds, indeed, are incomplete monopolies, in that the law permits non-insurance and allows insured employers to withdraw at will. Under such a law full reserves are the price of solvency.

⁴⁸ A common rule is one additional annual premium on account of a deficit incurred during the term of insurance. Assessment liability is often limited to twelve months after the expiration of the policy.

⁴⁹ It is not overlooked that many local fire mutuals operate on the full assessment plan with no stated premium and no assets in hand. But this plan has not been attempted, nor would it be tolerated, in compensation insurance. The distinction is that the fire losses of these local mutuals can be ascertained and paid for at the end of the year whereas compensation payments extend many years into the future.

⁵⁰ Among stock company failures of recent years may be noted the Union Casualty of Philadelphia, the Massachusetts Bonding and Indemnity of Boston, the Casualty Company of America, New York, the Guardian Casualty of Utah, the Prudential Casualty of Indianapolis and the Commonwealth Bonding and Casualty of Texas.

All these failures involved compensation liabilities of substantial amount.

⁵¹ The Industrial Insurance Department of Washington has strained the construction of the statute to exclude hernias from the category of work injuries and has prided itself, in official reports, upon the elaborate machinery built up to assure that no compensation shall be paid upon invalid claims.

There is grave need for a thorough and impartial investigation of claim settlement in representative states under different types of insurance and administration.

⁵² In Ohio, at the time of the writer's examination of the State Fund, June, 1919, 40 per cent of the compensable accidents which occurred in May and 35 per cent of those which occurred in April were still *pending and with no compensation paid*. *Actuarial Audit*, p. 42.

In Pennsylvania during 1920 under a two weeks' waiting period the average interval between accident and first payment in 10,000 cases taken at random was *seven weeks*. In Illinois the record is much the same or slightly worse. Figures in both these instances are from special studies by the administrative authorities.

⁵⁸ *Actuarial Audit of the Ohio State Fund*, 1919, pp. 43-45.

⁵⁴ Experience charges under the Ohio plan are limited to 20 per cent of manual (class) rates. But the plan applies to every employer who has developed \$100,000 of payroll *from the inception of insurance in the fund* and the charge stands until the cumulative loss ratio of the employer falls to normal. A country machine shop which employs ten men would pay a surcharge of twenty per cent of premium for a quarter century on account of one fatal accident.

⁵⁵ The Massachusetts Employees' Insurance Association was intended by its sponsors to be an insurance monopoly under the management of employers. In the course of legislative compromise the Association became an ordinary competitive mutual.

⁵⁶ This is a favorite argument with labor unionists. Organized labor, indeed, is generally favorable to a state monopoly of compensation insurance. The prevalence of this attitude appears to be attributable, partly to a strong prejudice against private casualty insurance companies which stands over from employers' liability days, partly to the hope of higher benefits through lower insurance costs, and partly to the influence of Mr. T. J. Duffy, Chairman of the Industrial Commission of Ohio, who is an ex-official of the Brotherhood of Operative Potters and whose administration of the Ohio State Fund is held in high esteem.

⁵⁷ For existing reserve laws in the United States see *post*, Ch. VII and *Annals of the American Academy of Political and Social Science*, March, 1917, pp.297-316.

⁵⁸ The writer has used such a table in Pennsylvania for several years with very gratifying results. Valuation in 1922 of some 300 indeterminate values in 1921 showed a reduction of about 10 per cent in total incurred cost. Each annual revaluation of the Pennsylvania State Fund and of the other participating insurers chartered in Pennsylvania has shown that the reserves previously set up were somewhat more than adequate.

⁵⁹ For the State Workmen's Insurance Fund of Pennsylvania this ratio is about 35 per cent.

⁶⁰ About 65 injuries per 10,000 are reported more than two months after occurrence.

⁶¹ The false ethics of interstate comity, whereby one insurance department licenses any company which has been pronounced solvent by any other insurance department, puts a premium upon low standards and permits insolvent companies to do a country-wide business under the aegis of the most complaisant insurance department that can be found. Some of the western and southern states are notorious in this regard.

⁶² By a curious perversion of public policy most American statutes for rate regulation look only to *adequacy* of rates. The ostensible purpose is to assure adequate reserves. But adequate rates in a single state for one of several lines of business transacted throughout the country are a very weak support to reserves. A thorough-going reserve law would be the really effective means of maintaining adequate reserves.

⁶³ The leading stock casualty companies of the United States have supported a rate maintenance bureau for some fifteen years. The bureau has repeatedly been reorganized under sundry names but with nearly the same constituency. It is best known to compensation students as the National Workmen's Compensation Service Bureau but has lately (1921) become the National Bureau of Casualty and Surety Underwriters.

⁶⁴ Wide differences usually exist in the published rates of bureau and non-bureau companies in open competitive territory, and still wider differences in the premiums actually collected. Illinois will afford a standing and **well**

known illustration. For conditions in Great Britain see *Report of Departmental Committee, u. s.*

⁶⁵ Reduced premiums are allowed in consideration of the furnishing of medical service by the employer. The allowance is often out of all proportion to the cost or value of the service.

⁶⁶ See *Third Annual Workmen's Compensation Report* of the Industrial Commission of Wisconsin, 1914, and *Report on Workmen's Compensation Insurance of the (Massachusetts) Commission to Investigate Practices and Rates in Insurance*, 1915. Much material may be found in the *Hearings* of the Lockwood Committee, New York, 1922.

⁶⁷ Such bureaus have been established by law or by administrative ruling in New York, Massachusetts, Pennsylvania, New Jersey, Wisconsin, California, Minnesota, Georgia and other states. The Compensation Inspection Rating Board of New York is the oldest of these state bureaus and has served as the model for most of the others. The legal status of the bureaus and the scope of their functions differ of course from one state to another. The features common to all are: (1) Compulsory membership upon the part of licensed carriers of compensation insurance, (2) management by elected committees of carriers, (3) maintenance by assessments upon the members and (4) supervision by the state.

⁶⁸ The procedure herein sketched is substantially that established in Pennsylvania under the Insurance Laws of 1921.

⁶⁹ Most rate regulation statutes in this country vest the duty of supervision in the insurance department. But few departments charged with this duty employ a compensation actuary or maintain a statistical staff or have made any serious study of compensation problems.

⁷⁰ In the administrative organization here suggested the compensation board would compile the statistics of compensation cost by industry classes while the rating bureau would compile payroll exposures. Close co-operation would, of course, be needed to assure a due correlation of losses and exposures. The compensation board would also determine the reserves to be set aside by each carrier by actual valuation of claims from its own records.

⁷¹ Cf. "The Public Supervision of Workmen's Compensation **Insurance**," in *Annals of the American Academy of Political and Social Science*, March, 1917, pp. 297-316.

CHAPTER VI

THE PREVENTION OF INDUSTRIAL INJURIES¹

Employers' responsibility is the key to the prevention of industrial injuries. The employer provides the place of work, assembles the machinery, materials and apparatus, selects the personnel, determines the processes and directs the operations. Whether the whole shall be conducted with a view to safety or with an eye single to profit, whether the working place shall be sanitary or unsanitary, the machinery well or ill guarded, the processes extra-hazardous or as free from danger as extant technology will admit—are circumstances within the discretionary control of the employer. It is for the employer to decide whether coal shall be under-cut or blasted off and solid, whether explosives shall be fired with fuse and caps or with electric batteries, whether gears shall be covered or exposed and whether hides shall bear the menace of anthrax or be disinfected before handling. Upon the active interest of employers, therefore, depends all effective effort for industrial safety.

The prevention of occupational accidents and disease is primarily an engineering problem and as such is reducible to terms of pecuniary cost. Industrial safety depends much more upon the construction of plant and equipment, the choice of materials and processes and the safeguarding of machinery than upon the discipline and training of employees. The surest prevention is the removal of hazards. Care in the presence of needless danger is at best an uncertain reliance. So long as grade crossings exist collisions will recur despite all admonitions to stop, look and listen and so

long as lead glazes and enamels are used pottery and enamel workers will continue to die of lead poisoning. How far this general principle reaches will be apparent from a review of work injuries in any basic industry.

Coal mining leads all other employments in the annual number of fatal and permanent injuries and in the aggregate economic loss occasioned by work accidents.² Nearly half of this total accident cost is attributable to falls of roof and coal, one-fourth to mine cars and motors, one-tenth to explosives, electricity and mine gas, and one-fifteenth to machinery and hoisting apparatus (Table IV). The promotion of safety in the mines will necessarily focus upon these few predominant hazards.

The inherent danger from falls is governed in the main by geological conditions. Disturbed and tilted strata, draw slate, clay veins, faults, slips and boulders are hazards bestowed by nature, but they may be circumvented by the ingenuity of man. Narrow rooms and wide pillars, care in undercutting and spragging,³ and abundance of timber close to the working face make for relative safety even under bad roof. More than one operator has by these methods produced a million tons of coal per fatal accident in the draw slate field of Western Pennsylvania, where three fatalities per million tons are considered normal. Timbering, it may be thought, is wholly a matter of discipline and care on the part of the miners themselves, but in reality much depends upon the method of mining. It is customary to set props six feet from the face before shooting, which leaves twelve feet of unprotected roof during the whole operation of loading out the coal and making the next cut. Yet it is perfectly feasible to operate short-wall machines when props are set within three feet of the face before the coal is shot down.⁴ The resultant reduction of one-fourth

in the area of unsupported roof would mean much to the safety of miners: quite 70 per cent of all fatal and permanent injuries by falls of roof and coal occur between the props and the face.⁵ The objection to closer timbering is purely that more time and care are required to set and "sump in" the machine when the props are close than when they are kept well back.

Of haulage accidents one-third are caused by collisions, derailments and runaway trips, one-sixth by scant clearance on haulage ways and at room necks, one-eighth by hand braking, hand coupling, hand pushing and hand switch-throwing and one-twelfth by the custom of walking the track to and from the place of work. Wrecks are mainly due to poor roadbed and equipment—light tracks, steep grades, low and high joints, defective frogs and switch points, worn rails, flat wheels and inefficient brakes. Air brakes and automatic couplers are perhaps utopic in the

TABLE IV

SEVERITY, DISTRIBUTION OF INJURIES IN THE INSURED BITUMINOUS MINES OF PENNSYLVANIA, 1916-1920, BY CAUSE OF ACCIDENT

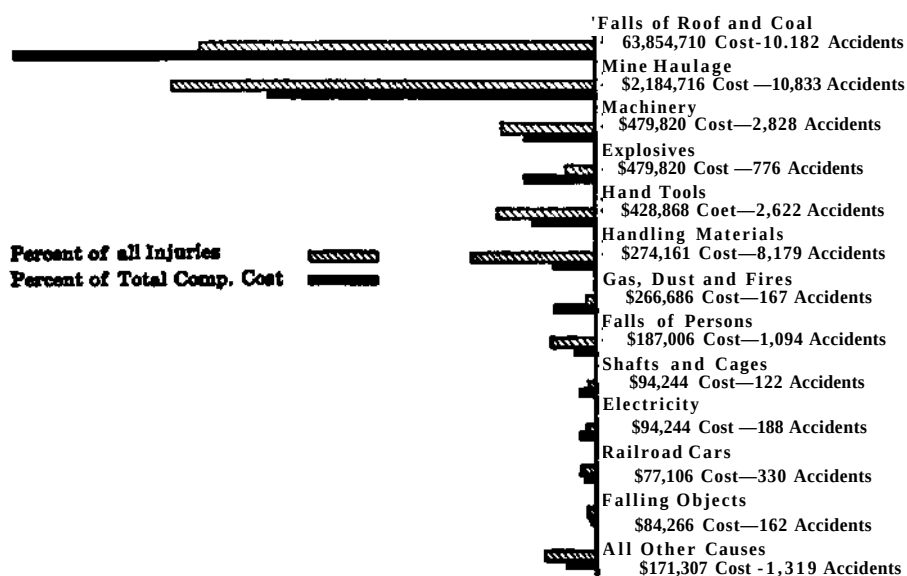


TABLE IV-Continued

CAUSE OF ACCIDENT (1)	PER CENT OF COMF. COST (2)	PER CENT OF SPECIFIED INJURIES ATTRIBUTABLE TO EACH CAUSE					PER CENT OF ACCIDENTS FROM EACH CAUSE RESULTING IN SPECIFIED INJURY			
		All (3)	Deaths (4)	Perm. Total (5)	Maj. Perm. (6)	Temp. Comp. (7)	Death (8)	Perm. Total (9)	Maj. Perm. (10)	Temp. Comp. (11)
ALL CAUSES	100.0	100.0	100.0	100.0	100.0	100.0	42	05	23	93.0
Boilers, Engines and Machines—	5.6	7.0	3.0	2.8	7.7	7.2	1.7	0.2	2.5	95.6
Shafts and Cages	1.1	0.4	1.9	—	0.5	0.3	21.3	—	3.3	75.4
Railroad Cars and Engines	0.9	1.0	12	0.5	0.7	1.0	4.9	0.3	1.5	93.3
Mine Cars and Motors	25.5	32.7	25.0	14.2	21.0	33.4	3.2	0.3	1.5	95.0
Electricity	1.1	0.6	2.4	—	0.1	0.5	17.5	—	0.6	81.9
Explosives	5.6	2.3	3.3	18.2	10.7	2.0	5.9	4.1	10.6	79.4
Gas, Dust and Fires	3.1	0.5	5.2	0.5	0.3	0.3	43.1	0.6	1.2	55.1
Falls of Roof and Coal	45.0	30.6	54.4	61.4	27.3	29.4	7.4	1.1	2.1	89.4
Falling Objects—Not Roof or Coal	0.4	0.5	0.3	0.5	0.4	0.5	2.5	0.6	1.9	95.0
Falls of Persons	1.6	3.3	0.7	0.5	0.5	3.5	0.9	0.1	0.4	98.6
Handling Materials	3.2	9.6	0.9	—	3.0	10.2	0.4	—	0.7	98.9
Hand Tools	5.0	7.6	0.5	—	26.7	7.5	0.2	—	8.1	91.7
All Other Causes	2.0	4.0	1.1	12	1.1	4.2	1.1	02	0.6	98.1

N. B.—Column 2 shows the per cent of total compensation cost attributable to each specified cause of accident.

Columns 3,4,5,6 and 7 show the per cent of each specified injury attributable to each cause of accident. These columns emphasize the RELATIVE IMPORTANCE of the several accident causes.

Columns 8,9,10 and 11 show the proportion of accidents from each cause which result in death, permanent total disability, permanent partial disability or temporary compensable disability, respectively. These columns show the relative severity of accidents from each cause.

Thus electricity was responsible for only 2.4 per cent of all fatal accidents (column 4); but 17.5 per cent of ail accidents from Electricity resulted fatally (column 8).

Table and graph from *Statistical Analysis of Coal Mine Accidents in Pennsylvania, 1916-1920.*

mines but it is both practicable and economic to maintain roadbed and rolling stock in good condition, to provide ample clearance, to have separate, safe and convenient traveling ways for all slopes and double track entries,⁶ to control trips by telephone, to eliminate man pushing and motor pushing of cars⁷ and to reduce the amount of shunting and coupling by a proper lay-out of the haulage system.

Explosives⁸ afford the stock illustration of accidents due to carelessness because short-fusing and going back to misfires account for two-thirds of all the injuries that occur in the use of explosives. But here also admonition is an ineffective remedy. Electric battery firing abates the evil by removing the cause.⁹ The same general truth might be illustrated from hoisting accidents, gas explosions and the numerous permanent injuries on mining machines. To reduce the hazards of mining attention must be focused upon plant, equipment and methods of work. Next to engineering, supervision is the principal means of promoting safety in the mines. Two daily inspections of each working place by a foreman or assistant foreman will accomplish more for the correction of careless practices than a multitude of leaflets, bulletin boards and safety rallies.

In quarry operations methods of work hold the first place among the conditions which augment or diminish hazard. Haulage and hoisting appliances cause 25 per cent of the fatal and permanent injuries, falls of rock and overburden 20 per cent, explosives 17.5 per cent, hand tools (chiefly sledges) 8.5 per cent, falls of persons 7.5 per cent.¹⁰ For hoisting and haulage accidents the preventives are much the same as in mining—proper cages for deep quarries, derricks with double drum engines which move the stone away from the working face before hoisting and traveling ways at a safe distance from the haulage slope. Care that

the quarry floor shall slope away from the face diminishes the liability to injury by runaway trips, reduces haulage costs and simplifies the problem of drainage. At crushed stone quarries, multiple primary shooting and steam or electric shovel loading are the most important safety measures. The big multiple blasts loosen enough stone for several months' operations and are charged and fired without exposure to the quarry operatives. Power shovel loading obviates three of the principal causes of fatal and permanent injuries: hand sledging, secondary shooting and baring down from the working face. In dimension stone quarries many accidents by falling objects and falls of persons may be avoided by stripping back the overburden, piling refuse at a proper distance from the pit mouth and making the successive terraces or benches wide enough for safe working.

In manufacturing industries as a whole mechanical equipment accounts for 60 per cent of the total accident cost.¹¹ Of accidents directly attributable to the use of power machinery one-half are caused by working machines, one-twelfth by prime movers and transmission, one-sixth by cranes, one-tenth by industrial and railway cars, one-twentieth by elevators, one-twenty-fourth by boilers and steam containers, and one-thirtieth by electricity.¹² Machine accidents, as commonly understood, relate primarily to injuries by the cutting, striking or squeezing action of the tool (point of operation) or by chips and particles which the tool sets in motion. Circular and band saws, metal presses, punches and hammers, wood jointers and shapers, calender rolls and dough mixers and moulders hold **a bad** pre-eminence for hazard at the point of operation.¹³ **The** chief danger on most of these machines is to the hand of **the** operator¹⁴ and the effective remedy is **a** mechanical device

which will feed in the material and remove the product without exposure to the attendant.¹⁵ For dough mixers and similar machines the best protection is an interlocking cover which cannot be opened while the paddles are in motion. In the operation of steam hammers and hot metal rolls the principal hazard is from throw back or thrust of the work when the hammer strikes and from the whipping of rods or bars as they pass at high speed through the rolls. The last mentioned hazard is nearly eliminated by mechanical mills wherein the ingots are conveyed on roller tables and the several passes through the rolls are automatically controlled by pipe and floor guides. Flying particles from the point of operation are second only to contact with the tool itself as a source of permanent injury.¹⁶ Accidents from this cause are especially frequent in the operation of emery wheels, hammers, lathes, drills, hot metal rolls, bottling machines and such portable power tools as riveters, reamers and chip hammers. Bottling and crowning machines may be protected by shields; emery wheels and some wood working machines by exhaust hoods. But goggles are the grand preventive of eye injuries, whether from machine or hand tools. Care in the design and fitting of these eye protectors is peculiarly important; workmen will not submit to the discomfort and inconvenience of wearing goggles that pinch the nose or gall the cheeks.

Power transmission¹⁷ has received an amount of attention from safety engineers, insurance carriers and factory inspectors out of all proportion to its real importance as a cause of accidents.¹⁸ Open gears, it is true, are a needless menace to employees and exposed shafting hardly less so. But the effective remedy for transmission hazards is direct connected motor drive. Direct motor drive removes the whole mass of hangers, shafting, belts and belt guards

which clutter up the working place, obstruct the light and endanger the lives of operatives.

Elevator accidents are mostly of three descriptions: falls of persons into shaft, caught between car and gate and caught between car and landing floor or side of shaft. The remedies are complete inclosure of the car and shaftway and an interlocking gate of such design that the gate cannot be opened until the car has come to rest at the landing nor the car be moved from the landing until the gate is shut. Crane hazards are less amenable to mechanical guarding because crane accidents predominantly occur in the operations of hooking-on, hoisting, moving and landing the load.¹⁹ Safe walkways along the bridge, proper clearance above and on both sides of the runway and due attention to the hoisting cable and its attachments are the most important structural precautions. For the rest, safety depends upon care in operation and upon such shop arrangements as will keep workmen away from the path of crane travel. Grab hooks controlled by the crane operator may be used for materials of standard dimensions, thereby eliminating most of the exposure in hooking-on and landing the load. Long crane hauls may frequently be obviated by the relocation of machines. Lastly, conveyors may often be substituted for cranes with a marked gain in safety and economy of operation.

All this may seem to belittle or perhaps to overlook the value of safety propaganda among the workmen. No one at all familiar with the subject will deny that carelessness on the part of employees is a contributory cause of very many injuries nor that the inculcation of safe practices is a highly important means of prevention. But just as warning signs do not remove the hazard of grade crossings and as traffic rules will not prevent excessive speed without the presence of the traffic policeman, so safety education is ineffective

unless it is preceded by safeguarding and followed up by supervision. Care in the performance of work is partly a matter of knowledge and partly of habituation. Workmen need to be taught the safest method of handling explosives, pouring acids or catching molten metal at the cupola and to be trained in the avoidance of acts which endanger themselves or others. The ways and means of such training have been widely popularized by the National Safety Council and are in daily use by thousands of inspectors and engineers. Like other slogans however, "safety first" is more often heard than practiced. Until supervision is directed to safety as well as to speed and cost of production, the efforts of the safety promoter will be a labor of Sisypheus.

The prevention of work injuries, in fine, is mainly a matter of cost. It is perfectly possible to reduce by one-half the average number of fatal accidents per million tons of coal²⁰ but to do so will require extensive changes in the mining industry. Entries must be widened, more and better timbers must be set, roadbed and rolling stock must be improved, electric voltages must be reduced,²¹ permissible explosives²² must be substituted for dynamite and battery for fuse firing, electric lights must replace oil lamps²³ and closer supervision must be exercised by a greater number of mine officials. What is true of coal mining will hold for other industries. It often happens, indeed, that the safest equipment or process is the most economical in the long run. Direct motor drive is a more efficient as well as a safer means of transmitting power than line shafts and belts, steam shovel loading reduces the cost of quarrying stone along with the frequency of injuries and mechanically fed presses turn out more cans at less risk to the operatives. But the first cost of installing the new device is often deemed prohibitive while every change of method or process

encounters resistance from the native inertia of employers and employees. Discovery of the safer way in fact demands close analysis of the particular process involved in relation to the circumstances, product and organization of the particular plant. The requisite trouble and expense will not be incurred unless strong inducements are brought to bear upon the keeper of the purse.

Employers are moved to accident prevention by humane interest, by penal statutes and by business motives. Safety first owes much of its popularity to humanitarian appeal. Many employers in every industry have done far more than the law commands, not in the expectation of pecuniary return but from sheer desire to avoid preventable deaths and injuries. Despite all humanitarianism, however, the prevalent standard of industrial safety is never much above, and is often below the minimum prescribed by statute. Legislation has been necessary in every state to enforce the guarding of machinery and protect the health of employees in dangerous trades. Notoriously unsafe and unnecessary practices—like fuse firing and the use of open lights in gaseous mines—persist indefinitely unless prohibited by law. Even such life and property saving devices as air brakes and automatic couplers were brought into use only by penal statute twenty years after their value had been conclusively demonstrated.²⁴ The police power is most effective as a means of promoting the health, safety and comfort of employees when the statutes are drawn in general terms and the framing and enforcement of detailed codes for particular employments are vested in administrative boards.²⁵ The efficacy of these codes is greatly enhanced wherever and in so far as employers realize that accident prevention pays as a business proposition. Even apart from compensation, industrial injuries cause a heavy

loss to employers by interrupting production and impairing morale.²⁶ But it is especially through the payment of compensation that the cost of work injuries is brought home to the entrepreneur. Compensation laws have everywhere given a notable impetus to the safety movement,²⁷ notwithstanding that the benefits are pitifully small. The higher the benefits the greater, of course, will be the incentive to prevention. Full indemnity for deaths and permanent disabilities is peculiarly important in this regard. Minor injuries may be obviated in large measure by educational and propagandist methods, but the preventives of fatal and permanent injuries are mainly of an engineering character.²⁸ (See Table V.)

TABLE V—RELATIVE NUMBER AND SEVERITY OF INJURIES FROM SPECIFIED CAUSES IN THE INDUSTRIES OF WISCONSIN, 1915-1920 *

CAUSES (1)	PER CENT OF TIME LOSS (2)	PER CENT OF SPECIFIED INJURIES ATTRIBUTABLE TO EACH CAUSE			
		All (3)	Deaths & Penn. Total Dis. (4)	Perm. Partial Dis. (5)	Temp. Dis. (6)
All Machines	26.0	20.0	11.3	54.0	17.5
Falls of Persons	12.3	12.7	15.4	4.3	13.3
Vehicles—including Rail- road and Industrial Cars	11.6	7.0	17.3	4.0	7.0
Falling Objects	10.3	8.8	14.5	4.0	0.0
Handling of Objects	9.7	24.5	6.7	13.0	25.6
Hoisting Apparatus	8.0	3.6	10.5	5.6	3.3
Electricity	3.5	0.5	6.7	0.4	0.4
Explosives	3.3	0.7	5.3	1.0	0.6
Hand Tools	3.2	7.3	1.2	5.0	7.5
Stepping on or Striking against Objects	3.0	6.0	2.3	2.5	6.1
Hot and Corrosive Sub- stances	2.5	5.2	3.0	1.0	5.5
All Other	5.6	3.7	5.8	5.2	4.2

* *General Accident Statistics for Wisconsin, 1921. Table I.*

Compensation cost is a direct incentive to accident prevention on the part of employers who carry their own risk. Upon insured employers the same influence is brought to bear through schedule and experience rating. By experience rating the premium rate of the individual employer is based to some extent upon his own accident record. This plan undoubtedly enlists the interest of large employers in preventive measures, but it has the disadvantage of defeating *pro-tanto* that distribution of risk which is a prime function of all insurance.²⁹ Schedule rating, on the contrary, looks to apparent hazards in the particular establishment. In so far as the schedule is soundly based these hazards are gauged by their average importance as accident producers in the industry at large, without reference to the experience of the individual employer. No one may have fallen into a particular elevator shaft nor lost his hand upon a particular rip saw, but it can be statistically determined that a given number of fatalities per annum will occur at one thousand unprotected elevator landings and that a given number of hands will be lost upon one thousand unguarded saws. From these facts a premium value is set for each exposure point and the employer is charged or credited in his insurance premiums for compliance or non-compliance with definite standards of safeguarding.

The principles of schedule rating may conveniently be illustrated by the Pennsylvania Coal Mine Rating Schedule.³⁰ The safety standards set up in this schedule attempt to embody the best extant mining practice and are more stringent in many particulars than the state mine law. The prohibition of oil lamps, of fuse firing, of open lights in any part of a gaseous mine, of motor-pushed trips and of timber recovery in pillar work;³¹ the insistence upon clearance at room necks and upon telephones in each

section of the mine, are important safety measures not contained in the laws of Pennsylvania but approved by the best opinion of mining men. Penalties for violation of these standards are proportionate in each case to the compensation cost of accidents attributable to the hazards involved, as determined by statistical experience. The physical condition of each mine is ascertained by actual inspection and the premium charges developed by application of the schedule are added to a minimum rate. The resultant insurance rates range from about \$1.50 to \$3.50 per \$100 of payroll, as against an average rate of \$2.25 for all insured mines. The differentials so produced have been well substantiated by the actual aggregate experience of the mines comprised in each rate group.³² Marked improvement in the insured mines has resulted from the application of the schedule. Electric cap lamps and battery firing of blasts have been extensively introduced, miles of entry widened to standard, thousands of cars equipped with brakes and careless practices corrected to a very gratifying degree. Best of all, many operators formerly indifferent have been stimulated to active interest in mine safety.

The Pennsylvania quarry schedule is similar in plan to the coal mine schedule and has produced similar results in the improvement of quarry practice.³³ The rating schedules in use for manufacturing industries are less effective because not based upon a statistical analysis of accident causes.³⁴ Even these schedules, however, possess two important merits: they set up definite and generally recognized standards of safeguarding and they offer positive inducements for compliance with these standards. The small employer, especially, needs help and suggestion as well as stimulus to accident prevention. He has neither the expert engineering service nor the facilities for research and experimentation

which are at the command of great employing corporations. Any scheme of insurance rating which brings the employers the results of wide experience and which offers definite rewards for the removal of specific hazards will accomplish something for the prevention of work injuries.

All effective effort for industrial safety must be guided by statistics of industrial injuries.³⁵ The number of injuries which come within the observance of any one man is too small, just as personal impressions are too vague and variable, to afford a secure basis for remedial measures. Statistics alone can furnish information of sufficient volume, range and accuracy to direct the work of the safety engineer. The statistical information of primary importance for prevention relates, of course, to the causes of industrial injuries. But cause analysis will be useful only in so far as the causes are specific to the particular industry and are given in precise detail. That a thousand men were killed by falling objects or that five hundred eyes were destroyed by flying particles may be of interest to the academic student, but the information is altogether idle for the purpose of prevention. The lumberman has little to fear from falls of rock nor the coal miner from falling trees. It is not enough even to know the fatality rate from falls of roof and coal in the bituminous mines of Pennsylvania. Coal is to be distinguished from roof because falls of coal are a hazard specific to pick mining and the preventive is a sprag rather than a prop. Draw slate is to be differentiated from other roof because draw slate may be secured by temporary posts and taken down as soon as the coal is loaded out. The manner of exposure, lastly, is not less important than the physical cause of injury. Fatalities in the operation of pulling timbers point the need of abolishing that practice and the accumulation of accidents between the props and

the face in undercutting, drilling and loading out the coal emphasizes the desirability of closer timbering. The same principle holds of accidents from flying particles. The immediate source of injury is doubtless a foreign body in the eye, but the means of protection will vary with the cause which set the particle in motion. A useful description will relate the injury to the emery wheel, the blast of dynamite or the hand tool which imparted momentum to the flying object. With respect to machine accidents, it is important not only to record the number and kind of injuries on each specific machine, but to distinguish injuries at the point of operation from those which are attributable to the driving mechanism and to flying particles actuated by the cutting or striking tool. The best of goggles will not protect the hand from contact with the grinding surface of an emery wheel and the most efficient non-repeat device is of no avail against the hazard of an unguarded belt. The guiding principle of cause classification, in short, is preventive value. The description of the accident must point to the objective fact or circumstance in the absence of which the injury would not have occurred.³⁶

Causes must be correlated with the number and severity of injuries in order to indicate the relative importance of each hazard. Mere frequency of injury is of little value for this purpose. The preponderating causes of deaths and major permanent disabilities are very different from the most frequent causes of minor permanent and temporary disabilities.⁸⁷ To measure the total importance of any hazard, therefore, it is necessary to convert injuries of several degrees of severity to some common denominator, such as compensation cost or weighted time loss.³⁸ By this device the relative significance of the several causes of injury is plainly shown and comparison of hazards is

made possible from industry to industry or from state to state.

The reports of industrial injuries received by more than thirty administrative boards in the United States furnish an ample basis for such statistical analysis as would serve the purposes of the safety engineer. Unfortunately, however, few of the compensation boards have made appropriate use of this abundant material.³⁹ The statistical output is fairly voluminous, indeed, but most of it is in the nature of useless information. Mining, manufacturing, construction and retail trade are lumped together in a single total, losses of fingers are included with losses of feet, hands and eyes as permanent partial disabilities, and non-compensable injuries are indiscriminately combined with disabilities of a more serious character. The classification of accident causes is in keeping with the classification of injuries. Significant distinctions are neglected in order to lay emphasis upon the day of the week, the hour of the day, the nativity of the injured and other minor items of statistics. Want of means is the excuse most frequently alleged for failure to make useful analyses, but want of interest on the part of administrative authorities is more often the true explanation. Compensation boards in too many states have nothing to do with the enforcement of safety laws; in other jurisdictions the commissioners are swamped by the routine hearing of claims. Neither appropriate statistics of industrial injuries nor effective promotion of industrial safety can be expected unless all phases of the subject are centered in a single administrative authority.

When all is said, an adequate scale of compensation benefits is the prime requisite for the prevention of work injuries. If industry bore three-fourths instead of 25 per

cent of the cost of occupational injuries it would be worth the employees while to spend time and money upon preventive measures. If the average cost of a fatal accident were \$10,000 and the average indemnity for loss of a hand were \$12 a week for life, much would become practical that is now deemed visionary.

NOTES

¹ This chapter was prepared in collaboration with Mr. G. C. Kelly, Manager of the Pennsylvania Compensation Rating and Inspection Bureau.

The writer is indebted to Mr. Rush N. Hosier, Superintendent of the Coal Mine Section of the Pennsylvania Compensation Rating and Inspection Bureau for much technical information on the hazards of coal mining.

One of the best general treatises on industrial safety is Beyer's *Industrial Accident Prevention* (1916). Schwedtman and Emery's *Accident Prevention and Relief* (1911) a pioneer work, is still useful. The publications of the National Safety Council (organized 1913) are the best current record of preventive methods and results. Much material on occupational diseases has been published by the United States Bureau of Labor Statistics. For other titles see bibliography.

² There are about 1,000 coal mine fatalities per annum in Pennsylvania and probably 2,500 in the United States. The number given in the reports of the United States Bureau of Mines is always considerably short of the actual total because of the omission of delayed reports and of deaths which do not immediately follow injury. These omissions amount to nearly ten per cent of the coal mine fatalities recorded by the Compensation Bureau of Pennsylvania in the five years 1916-19 20.

⁸ Blocking to support the coal during undercutting. Spragging is especially necessary in pick mining.

⁴ So much was demonstrated by the Engineers' Committee of the Coal Mine Section of the Pennsylvania Compensation Rating and Inspection Bureau in a series of tests during the summer and fall of 1920. It was found that props snugly set within three feet of the face were *not* knocked out by shooting and that a short wall machine *can* "sump in " when props are set within three feet of the face before the coal is shot down.

⁶ See *Statistical Analysis of Coal Mine Accidents in Pennsylvania, 1916-1920*, published by the Coal Mine Section of the Pennsylvania Compensation Rating and Inspection Bureau. Other statements as to the causes of coal mine accidents are from the same source.

⁶ The Mine Law of Pennsylvania requires a separate manway on all slopes but the manways are often circuitous and not infrequently wet or in bad repair. Men will generally take the shortest and easiest route to the surface. A double compartment slope with traveling way well lighted and easy to ascend will remove all temptation to walk the haulage slope.

⁷ Motor-pushed trips are responsible for 7 per cent of all haulage accidents. Pushing cars by hand is responsible for 6 per cent of the fatal and permanent injuries and 20 per cent of the temporary disabilities in connection with mine haulage. Both practices can be avoided by proper lay-out of haulage roads and by installing car hoists for rooms which run to the dip.

⁸ Explosives are responsible for 12 per cent of the accident cost in anthracite mining, 6 per cent in bituminous mining and 17.5 per cent in stone quarrying.—Figures are from Pennsylvania compensation insurance experience.

⁹ Accidental firing is nearly impossible with a properly designed electric battery and delayed firing does not occur. The detonator either explodes or fails once for all.

¹⁰ *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1920*, pp. 56, 57.

¹¹ Statistics cited in this section are from the *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1920*, and from unpublished data supplied by Miss Snyder, Statistician of the Pennsylvania Compensation Rating and Inspection Bureau. See also the excellent *General Accident Statistics for Wisconsin* (Madison, 1921) and several reports issued by Industrial Accident Commissions of California and Oregon.

¹² These proportions vary, of course, with the industrial character of the community. Industrial cars and overhead cranes play a much larger rôle in the industries of Pennsylvania than in those of Massachusetts or Connecticut.

¹³ In Wisconsin saws are responsible for 17 per cent, stamping presses for 15 per cent and wood jointers, planers and shapers for 6 per cent of the total time lost from point of operation accidents—General Accident Statistics, W. S., Table II - B. In Pennsylvania insurance experience, 1916-1920, one-half of the total cost of working machine accidents was attributable to the following machines: saws 14 per cent, metal stamping presses 8 per cent, metal rolls 5 per cent, emery wheels 5 per cent, power hammers 4.5 per cent, wood jointers, moulders and shapers 4.5 per cent, portable power tools (metal working) 4 per cent, dough mixers and moulders 4 per cent, flat work ironers (laundries) 2 per cent.—*Statistical Analysis*, U. S., Table XVIII-A.

¹⁴ Of 276 permanent injuries on saws, jointers, forming presses, dough mixers and flat ironers in Pennsylvania insurance experience, 226 involved loss of hand.

¹⁶ Mechanical feed is practicable on any saw, jointer, shaper, forming press or dieing-out machine which is producing standard shapes and sizes. Where the product is frequently changed or the machine is used for a variety of purposes hand feeding is unavoidable. Enclosure of the point of operation, non-repeat devices and other "guarding" are much less effectual than mechanical feed.

¹⁵ Of 868 major permanent injuries on working machines in Pennsylvania Compensation insurance experience, 242 were loss of eye, and of 834 fatal and permanent injuries on points of operation, 177 were due to flying par-

tides. Below are listed the machines most conspicuous for hazard from flying particles, with the percentage of point of operation accidents due to this cause.

MACHINES	PER CENT OF FLYING PARTICLES TO ALL POINT OF OPERATION ACCIDENT.
Portable Power Tools.	.90
Bottlers and Crowners.	.80
Emery Wheels.	.70
Drills (metal).	.70
Lathes (metal).	.60
Hammers.	.33
Shears.	.25
Rolls (metal).	.20

¹⁷ Transmission is here used to include machine belts and gears as well as primary and intermediate drives.

¹⁸ In total severity, point of operation accidents are at least ten times as important as transmission accident, though it is fair to assume that the latter would be more numerous but for the attention bestowed upon the guarding of transmission. In the Wisconsin experience heretofore cited, shafts and shaft projections are accountable for one-half and belts and pulleys for two-fifths of all transmission accidents. Exposed gears, thanks to a concerted drive by the Industrial Commission, appear to be extremely rare in Wisconsin. Eight years ago gears were responsible for one-third of all transmission accidents. *Industrial Accidents in Wisconsin, 1912-1914*, Madison, 1915.

¹⁹ The principal causes of crane accidents and their relative importance in total accident cost are: struck by load, hook or bucket in hoisting, swinging or lowering, 30 per cent; struck by falling load, 35 per cent (due to breaking of cable 10 per cent); caught by crane on runway, 20 per cent; falls of persons from cab or runway, 7 per cent; caught in machinery, 5 per cent.—*Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1920*, p. 52.

²⁰ The average production of bituminous coal per fatal accident in the whole United States for the five years 1916-1920, was only 225,000 tons—See *Coal Mine Fatalities in the United States, 1920*, U. S. Bureau of Mines, Table 23. In Pennsylvania during the same period the bituminous production per fatality exceeded 312,000 tons. The superior showing of Pennsylvania is mainly attributable to a better mine law and better enforcement thereof. Many individual operators have consistently produced more than 500,000 tons per fatal accident over a period of years.

²¹ Of 88 fatalities by electrocution in the bituminous mines of Pennsylvania, 1916-1920, more than three-fourths occurred on voltages in excess of 400 a. c. or 500 d. c., notwithstanding that such voltages are quite excep-

tional in the mines. The reason for the use of voltages in excess of 220 is economy in copper wire.

²² Explosives approved by the United States Bureau of Mines for use in gaseous workings.

²³ In the anthracite mines of Pennsylvania during the five years 1916-1920, 128 men were killed by walking into pockets of gas with open lights, 25 by lighting squibs in the presence of gas and 19 by smoking in gassy places.

²⁴ So late as 1893, when the Federal Railway Safety Appliances Law came into operation, only 35 per cent of the freight cars in use were equipped with automatic couplers and only 27 per cent with power brakes. It was not until 1906, indeed, that 90 per cent of freight cars were furnished with train brakes. Yet the efficiency, economy and safety value of power brakes had been demonstrated to the satisfaction of every operative official thirty years before.—Downey, *History of Labor Legislation in Iowa*, Ch. V.

²⁵ The Industrial Commission of Wisconsin was invested with such power eleven years ago and has achieved marked success in administrative legislation. The codes are drawn by representative committees of employers and employees in the industry affected and are only put into effect by the commission after thorough investigation. The best existing practice is usually the point of departure and the immediate aim is to raise the prevalent standards of the industry to the level already attained by the more progressive establishments.—See Commons and Andrews, *Principles of Labor Legislation* and Papers by John R. Commons on the Industrial Commission of Wisconsin in the *American Labor Legislation Review* for Dec, 1911, and Feb., 1913. A similar plan under various forms has been adopted in many states.

²⁶ The plant manager of a large agricultural implement works assured the writer several years ago that temporary disabilities cost the employer more in loss of production than the total wage loss to employees.

²⁷ It was not by chance that the National Safety Council was organized after compensation laws had been enacted in twenty states and that its growth has been concomitant with the compensation movement.

²⁸ Hence it is that a reduction in the *number* of accidents is much easier to accomplish than a reduction in the *weighted* time loss per thousand employees. Thus in Table II and in the graph opposite Table I it is notable that handling of objects (including hot and corrosive substances), hand tools and stepping on or striking against objects are responsible for a number of accidents out of all proportion to their total importance. The reverse is true of hoisting apparatus, electricity and explosives—For enlargement on this point in the steel industry see *Bulletin of the U. S. Bureau of Labor Statistics*, No. 234 and the *Monthly Labor Review* for October and November, 1919, June, 1920 and September, 1921.

²⁹ C/. Ch. V.

³⁰ The first coal mine rating schedule (1915) was projected in the main by the late H. M. Wilson of the Associated Companies. From this original the existing Pennsylvania schedule was evolved in the course of several years by the Engineers' Committee of the Coal Mine Section of the Pennsylvania

Compensation Rating and Inspection Bureau. The coal mine rating schedules in use in other states are largely modelled upon the Pennsylvania schedule.

³¹ Pulling props were responsible for 113 fatal accidents in the bituminous mines of Pennsylvania during the five years 1916-19 20.

³² The rating bureau keeps a continuous record of the results of schedule rating and of the accident experience of each insured employer.

³³ The quarry schedule was conceived and worked out by Mr. G. C. Kelly, Manager of the Pennsylvania Compensation Rating and Inspection Bureau. The results of quarry schedule rating are the more gratifying because quarries in Pennsylvania are not subject to safety regulations nor inspection by the state.

³⁴ The Industrial Compensation Rating Schedule, 1918, now in general use, was evolved by the National Reference Committee on Schedule Rating from the Universal Analytic Schedule, 1913, of which Mr. C. M. Hansen was the principal author.

³⁵ See a paper on *The Essentials of Workmen's Compensation Statistics* in the *Journal of Political Economy* for Dec, 1914.

³⁶ An excellent brief classification of accident causes is contained in *Bulletin of the U. S. Bureau of Labor Statistics*, No. 276, pp. 32-51.

³⁷ This point is illustrated by Tables I and II, *supra*.

³⁸ For weighted time loss as a measure of the severity rate of industrial injuries see *Bulletin of the U. S. Bureau of Labor Statistics*, No. 276, pp. 71-77.

³⁹ The compensation authorities of Wisconsin, Oregon and California are notable exceptions to this statement.

CHAPTER VII

THE AMERICAN COMPENSATION SYSTEM

The United States was the last of the great industrial nations to recognize a social interest in work injuries. Germany, Austria-Hungary, France, Great Britain, the Scandinavian countries, Belgium, Holland, Italy, Spain and even Russia had all accepted the principle of industrial responsibility for industrial injuries long before that principle was seriously debated in American legislatures.¹ So late as the first decade of the twentieth century the common law of employers' liability still governed the right of American workmen and their dependents to indemnity for personal injuries arising out of their employment.

The essential feature of the common law was liability for injuries attributable to the fault or negligence of the employer. Every man, so ran the ancient Roman maxim, is bound so to conduct his own affairs that others shall receive no harm therefrom.² But this liability as respects injuries to employees was limited to wrongful, which is to say negligent acts of the employer; negligence was defined as the want of ordinary or reasonable care and reasonable care was held to be only that degree of carefulness and precaution for the safety of human life and limb which was customary among employers.³ It followed that the worker himself assumed all risks incident to his occupation as ordinarily carried on and that for an injury arising out of these risks he had no remedy. By an extension of the same doctrine the workman was held to assume the risk of injury by his employer's negligence if only he knew, or might have

known, of the negligent act or omission—the defect of machinery, appliance or working place—which caused his injury.⁴ Furthermore, the employee could not recover even for the grossest disregard of ordinary precaution on the part of his employer if his own want of care or foresight had in any degree contributed to his misfortune,⁵ Lastly, the employee was without remedy against the negligence of a fellow servant or co-worker, whether his actual associate, or some car repairer of whom he had never heard, or the foreman of the mine who had the power to hire and fire.⁶ By this concatenation of judge-made doctrines—no liability without fault, assumption of risk, contributory negligence and the fellow-servant rule—some seven-eighths of all work injuries were left without legal relief.⁷ In highly organized industries indeed, such as railway transportation or steel manufacturing, great employing corporations were able to escape all liability by the simple device of delegating every duty to employees.⁸ Even in the rare cases where liability existed recovery could be had only by a suit at law. The suits were necessarily prosecuted on a contingent-fee basis and quite half of the amounts ultimately awarded were handed over to attorneys. Litigation was long drawn out, appeals, reversals and retrials were numerous and several years ordinarily elapsed between the date of injury and the final award. The result rarely turned upon the merits of the case and the amount of the verdict was wholly a matter of caprice. The difficult and doubtful adventure into the courts was worth while only for fatal or serious permanent injuries: for temporary disabilities the legal remedy was altogether ineffective.⁹

Statutes were enacted before 1910 in nearly every American jurisdiction to mitigate the hardships of the common law in particular employments. By these statutes the

fellow-servant rule was so modified as to make railway and mining corporations responsible for the acts of officers, foremen and superintendents, the employer was denied immunity for the non-performance of certain duties, assumption of extraordinary risks was restricted or even abrogated and contributory negligence was made an offset to damages instead of a complete bar to recovery.¹⁰ But this legislation, for the most part, affected only mines and railways and it left untouched, even in these employments, the chief defects of the common law. Liability still depended upon positive negligence and was still enforceable only by an action in damages. Notwithstanding all employers' liability statutes, wage earners individually still bore at least nine-tenths of the economic cost of work injuries while, of the meagre sums paid out by employers in damages and in liability insurance premiums, barely one-fourth reached the victims of industrial accidents.¹¹

The injustice and inexpediency of this situation gradually forced itself upon the public consciousness. Organized labor, after wasting its energies for many years upon employers' liability laws, turned at last to workmen's compensation. A series of notable studies by the United States Bureau of Labor during Roosevelt's administration drew attention to the successful experience of European countries in workingmen's insurance and to the lamentable failure of our own country to meet the problem of work injuries. Publicists, reformers and muck rakers took up the work of popular education; the American Association for Labor Legislation,¹² the Pittsburgh Survey and *Charities and The Commons* made the facts and arguments familiar to all who read.¹³ Lawyers, judges and teachers of law exposed the fallacies of the rules which it was their business to expound and spoke courageously for a legal principle which would

better serve the ends of social justice.¹⁴ Already in 1907 President Roosevelt could say: "It is neither just, expedient, nor humane; it is revolting to judgment and sentiment alike that the financial burden of accidents occurring because of the necessary exigencies of their daily occupation should be thrust upon those sufferers who are least able to bear it. When the employer starts in motion agencies which create risks for others, he should take all the ordinary and extraordinary risks involved."¹⁵

The awakening of public conscience to the social problem of work injuries led, near the end of the first decade of the present century, to the appointment of many official commissions and legislative committees to investigate the subject of employers' liability and workmen's compensation.¹⁶ These commissions held public hearings, took volumes of testimony, gathered much original material on the working of employers' liability and recommended legislation designed to sweep away the common-law system.¹⁷ In consequence of all this agitation sixteen compensation laws were enacted before the close of the legislative year 1912. The less progressive states gradually fell into line until at the end of 1921 only six commonwealths and the District of Columbia retained the outworn system of employers' liability.¹⁸ Seldom has a legislative movement of equal social significance spread more rapidly over the land.

Territorially speaking, the American compensation system is almost complete. Save only Missouri, every industrially important commonwealth in the United States, and every manufacturing or mining province in the Dominion of Canada¹⁹ has embodied the principle of compensation in statute law. Industrially the new system is much less comprehensive. Congress has failed to enact laws for the protection of seamen and of railway workers engaged in

interstate commerce²⁰ and the Federal Supreme Court, by a most unfortunate decision, removed longshoremen from the jurisdiction of the several states.²¹ Congress passed an act, on June 10, 1922, amending the Judicial Code, which undertook to give to the states jurisdiction over maritime workers, except members of the crews of vessels. This act was declared unconstitutional by the Federal Court of the Southern District of Alabama.²¹⁰ Most of the state laws except agricultural and domestic employments,²² many exempt establishments which employ fewer than four, five or even ten persons,²³ some few leave public employees without the pale.²⁴ Certain acts are limited to enumerated "extra-hazardous" employments but the list of such employments is usually so comprehensive as to belie the designation.²⁵ Home workers and casual employees not in the regular course of the employer's business are everywhere excluded. In respect to injuries covered a majority of the jurisdictions still exclude occupational disease²⁶ and nearly all require that the injury shall both arise out of and occur in the course of the employment.²⁷ Having regard to all these limitations it is perhaps within the mark to say that some two-thirds of the work injuries which annually occur in the United States are covered by the compensation scheme.²⁸

A curious feature of the American compensation laws is that nearly all are elective in form, though not in substance.²⁹ This device was foisted upon the legislatures by a perverse decision of the Court of Appeals of the State of New York which held that the principle of no liability without fault was guaranteed by the due process clause of the constitution.³⁰ The decision was promptly repudiated by every other court in the land³¹ and was rebuked as **bad** law and bad morals by the most distinguished teachers

of constitutional law in the great universities.³² Yet **the** discredited opinion of a single reactionary court has influenced the whole subsequent course of legislation and has induced state after state to resort to the legal fiction of elective compensation. By the quasi-elective plan the employer may reject the compensation scheme by written notice to the appropriate administrative authority,³³ but he subjects himself thereby to common-law liability without the common-law defenses of fellow servant, assumption of risk and contributory negligence. This option is rarely exercised in any state for the sufficient reason that the undefined liability thereunder is apt to be more costly than the limited compensation within the statute.³⁴ Vice versa the employee is usually privileged to reject the benefits of the act by written notice to his employer before injury. Election by either party is in truth the merest sham. None the less, the conditional privilege has operated as a deterrent to an adequate scale of benefits: high benefits might induce employers to elect out of compensation.

The benefit scale is the weakest feature of the American compensation system. The forty-odd statutes present the greatest diversity in nominal rate of compensation, in weekly maxima and minima, in waiting period, in the length of time for which payments continue, in the basis and amount of death benefit and in the provision made for medical, surgical and hospital care of the injured. No consistent principle runs through these endless variations because none of the laws is grounded upon any well reasoned proportionality of compensation to wage loss. In the same act a relatively high nominal rate is contradicted by a low weekly maximum or offset by a long waiting period; liberal medical benefits are juxtaposed with grossly inadequate limits for permanent disabilities and life pensions are fixed

at so low a rate as to be little more than a subvention to the Associated Charities. Amid this welter of inconsistency, the single feature common to all the acts, though in varying degrees, is insufficient benefits. No state has established a really adequate scale of compensation, such as would serve to minimize the social cost of work injuries.⁸⁵

The disability benefit is nominally fifty per cent of wages in twelve states,³⁶ sixty per cent in nine states,³⁷ sixty-five per cent in four³⁸ and sixty-six and two-thirds per cent in eleven states and the Federal government.³⁹ But the weekly compensation is almost everywhere subject to fixed maxima—no maximum or minimum provisions in two,⁴⁰ \$12 in five,⁴¹ \$15 in nine,⁴² \$16 to \$18 in fifteen states and the Federal government,⁴³ more than \$18 in only seven.⁴⁴ The corresponding minima are of no consequence, being usually fixed at less than the wage of the youngest child or the greenest apprentice, whereas the maxima contemplate a wage near or even below the average earnings of unskilled adults. The effective rate of compensation is, therefore, much less than the nominal percentage of wage: under fifty per cent in the aggregate for all but half a dozen states and as low as twenty or twenty-five per cent in thousands of individual instances.⁴⁵ These payments begin to run after a waiting period of one week in twenty-three states, ten days in six states, two weeks in six states and three days or less in only two states.¹⁶ Having regard to the combined effect of nominal rate, maximum weekly amount and waiting period, it is safe to assert that compensation under the most liberal of our laws does not exceed one-third of wage loss in cases of temporary disability.⁴⁷ Taking the country as a whole and disregarding injuries not subject to compensation, the temporary disability benefit is not more than one-fourth of wage loss.

For permanent disabilities compensation bears a still smaller proportion to economic loss. Only nine states—New York, Ohio, West Virginia, Colorado, Oregon, Washington, North Dakota, Nebraska and Nevada—pay a straight life pension for permanent total disability. Even these pensions in no case exceed two-thirds of wages and all are subject to arbitrary weekly maxima. California, Idaho, Illinois, Montana and Utah, provide that payments shall continue during total disability but shall be reduced to \$12, \$10 or even \$5 weekly after five, six or ten years, if the injured is so unfortunate as to survive beyond that period.⁴⁸ In other states payment for total disability is limited to six, eight or ten years,⁴⁹ and often to a total amount of \$4,000 or \$5,000.⁶⁰ Since the average age of persons permanently incapacitated by injuries is little more than forty years the typical American compensation act provides only partial support for about one-third of the remaining life expectancy.

Still more curious, inadequate and indefensible are the benefits for permanent partial disability. For loss of a hand, foot, leg or eye the *rate* of compensation is usually the same as for total disability but the *duration* thereof is limited to a stated number of weeks: 200 weeks for the loss of an arm or leg, 150 weeks for the loss of a hand or foot, 100 weeks for the loss of an eye. No attempt is made in these specific indemnity schedules to apportion the amount of compensation to the degree of disability or even to preserve any relativity as among the several injuries enumerated. One state allows more for an arm than for a leg, another reverses these proportions; one accounts a hand the same as an arm, another distinguishes shoulder, elbow, wrist and palm.⁵¹ Wholly apart from these haphazard inequalities, the schedules are fundamentally unscientific and

inequitable in that they provide compensation for a limited term on account of disability which is permanent in character. Even so, the specific indemnities are preferable to those clauses in many of the statutes which promise compensation during 300 or 500 weeks on the basis of loss of earnings.⁵² The specific indemnity schedules at least pay something, however inadequate the amount, but the loss of earnings clauses are a delusion and a snare. Few indeed of the injuries governed by the loss of earnings rule are ever compensated at the full sum ostensibly provided by law.⁵³ To every other defect it must be added that the amount of compensation, alike under the specific indemnity schedules and the loss of earnings clauses, is wholly insufficient. Even the New York schedule—all things considered, the most liberal in the United States—pays less than half of the wage loss occasioned by serious permanent injuries.

In case of death seven states—Minnesota, New York, West Virginia, Washington, Oregon, North Dakota and Nevada—and the Federal government provide a pension to the widow during widowhood and to children up to the age at which they may legally be employed.⁵⁴ In Pennsylvania, Delaware, Idaho and Wyoming payments to children continue through the period of compulsory school attendance although the widow's pension terminates six or eight years after the husband's death.⁵⁵ But in quite three-fourths of all the states the death benefit ceases after a stated number of weeks—commonly six years⁵⁶—irrespective of the number, ages or status of dependents. Even this short period often is further curtailed by the device of a maximum total amount.⁵⁷ In two-thirds of the states, again, compensation is the same to a widow and seven children as to a widow alone. The pensions usually are very small. Under most of the statutes the rate is the same

as for disability and is subject to the same weekly maximum: \$12, \$15 or \$18. In eighteen commonwealths the allowance varies with the number and relationship of dependents.⁵⁸ The widow's pension in a majority of these states is nominally thirty or forty per cent of wages with ten per cent additional for each child, but the maximum weekly payment to the largest family is \$12 in Pennsylvania, \$15 in Alabama and only \$20 in New York. By a singular perversion of common sense the allowance to orphaned children is usually less (where any distinction is made) than to an able-bodied widow.⁶⁹ But neither the inadequate weekly rate nor the limited total amount is as indefensible as the foreshortened duration of payments. A majority of the children orphaned by industrial accidents are under eight years of age, more than a third are under five and nearly a sixth are under two.⁶⁰ Compensation to these children is, in most states, cut off before they have finished the grammar grades or even before they have entered the public schools. To the childless widow of thirty the time limit of three hundred weeks may not be particularly unjust, but to the mother of several young children or to the woman of fifty who has been a housekeeper for twenty-five years,⁶¹ the restricted period of compensation merely postpones the day of pauperism.

For inadequate death and disability benefits there is at least the excuse of low cost to employers, but for insufficient medical, surgical and hospital care even this pretext fails. The cost of unlimited therapeutic relief is, in per cent of payroll, a bagatelle. Yet it is in their medical provisions that the American compensation laws are most absurdly deficient. One state⁶² requires no medical, surgical or hospital treatment of injured workmen, five states⁶³ demand such treatment for no more than two weeks after the

injury, seven limit statutory care to thirty days,⁶⁴ seven to sixty days⁶⁵ and six to ninety days.⁶⁶ Many states impose, besides, a monetary limit of \$100, \$150 or \$200.⁶⁷ These limits are to be read in the light of surgical records and surgical charges. The cost at regular rates of reducing a simple fracture of the arm or leg is not less than \$200 and the cost of a major amputation—to say nothing of open operations or of orthopaedic surgery—is at least \$500. A badly infected wound, a deep burn, a fracture of any long bone or a dislocation of any major joint will commonly require attention for more than sixty days and operative procedure to relieve ankylosis, adhesions or malformations is frequently needed a year or more after the injury. The effect of the niggardly medical limitations in our compensation acts is to deprive thousands of injured workmen of that therapeutic care which would prevent permanent disability and to throw tens of thousands into charity wards and free clinics.

In fine, the American benefit scales are grossly inadequate whether measured by the economic cost of industrial injuries or by the needs of injured workmen and their families. All the acts profess to be based upon the principle of occupational risk but all fall much short of realizing that principle in practice. Even under the most liberal of our compensation laws, industry bears less than half of the direct monetary cost of work injuries. In Pennsylvania, New Jersey, Colorado, West Virginia and other low-benefit states compensation does not amount to one-fourth of wage loss. A fair estimate of the composite scale for all states would indicate that industry bears about one-third of the economic cost of those injuries which are subject to compensation. Having regard to the great army of wage workers in the common-law states and in occupations not

covered by the compensation system it is well within **the** facts to say that four-fifths of the wage loss resulting from injuries in the course of employment still falls upon the individual victims thereof. Approached from another standpoint, the money benefits in most states are clearly insufficient to maintain a normal standard of life even during the continuance of compensation and these insufficient payments are almost everywhere cut off at the expiration of an arbitrary period without regard to the needs of the injured worker or of those dependent upon him. Medical benefits, lastly, are nowhere adequate to relieve the suffering of the severely injured or to restore their earning capacity so far as the same may be capable of restoration.

By comparison with the miserly scale of benefits, other shortcomings of the American compensation system are of minor consequence. Yet the administration of the laws leaves much to be desired. Most of the states, indeed, have created commissions *ad hoc* with fairly broad powers; only nine commonwealths⁶⁸ still retain the British system of adjudication by the ordinary courts. The work of the compensation boards will compare favorably with other branches of public administration in this country. The number of disputed claims is small, appeals are few and the statutes, on the whole, are liberally construed. In contrast with the law courts the commissions are even models of promptness and efficiency. But the commissioners are political appointees, frequently changed,⁶⁹ the scale of salaries is low, the appropriations are inadequate for the work to be done and the administrative staffs are often political and usually under-manned, under-paid and ill-trained. Few of the boards are furnished with field investigators or are otherwise equipped to go out and find the facts. Initiative in the settlement of claims rests primarily

with employers and insurance carriers; if a claim is resisted the claimant must present his petition and prove his case.

Disputed claims are heard before the commissioners themselves or before referees or examiners by a procedure which is intended to be informal. But commissioners and referees are habitually drawn from the ranks of practicing attorneys and are imbued by long experience with a predilection for the forms of the common law. The boards, moreover, are subject to court review, not only on the interpretation of the statutes, but on the sufficiency of the evidence to support their findings of fact.⁷⁰ The possibility of reversal on technical grounds enforces the observance of forms that might otherwise be disregarded. Lastly, the want of field investigators and of funds for impartial medical examinations compels reliance upon the testimony produced at hearings. For all these reasons much technicality has crept into compensation procedure. Hearings take on a litigious character, with prescribed forms of petitions, answers, summonses and findings;⁷¹ both parties are commonly represented by counsel and a substantial proportion of death and permanent disability benefits is diverted to contingent fee attorneys.⁷² Court appeals, too, are numerous in certain jurisdictions, with the usual results of expense, delay and uncertainty in the administration of the law.

Formal hearings, however, affect at most some five or ten per cent of compensation cases. The most important and difficult work of the commissions is not the determination of disputes but the supervision of settlements by agreement. Agreements are, in most states, subject to the board's approval and no release or final receipt is valid unless compensation has been paid in accordance with the statute. Unconscionable settlements are in fact freely set aside when brought to the attention of the boards and numerous cases

in which compensation has been suspended are reopened upon proof that disability has recurred. But the power of review is effective only in so far as facilities exist for its exercise. The supervisory work of the boards is handicapped by want of funds, by the lack of field investigators and by that general disposition to rely upon claimants' initiative which is deeply rooted in American *laissez faire* traditions. Unscrupulous adjusters find it easy to impose upon foreign speaking workmen and their widows and many a conscienceless settlement is made and final agreement secured which is never called in question. This species of abuse is especially prevalent in cases of permanent partial disability not covered by the specific indemnity schedules.⁷³

Even more serious than short changing—which, after all affects relatively few cases—is the habitual delay in the payment of compensation claims. There are no systematic statistics on the subject but such test studies as have been made in Illinois, Ohio, Pennsylvania and New York indicate that compensation for temporary disability is habitually not paid until disability has ceased and the injured has returned to work, that initial payments on death claims are often unreasonably delayed and that compensation for permanent disability is suspended out of hand upon the mere allegation of the employer or insurance carrier that the claimant can do light work.⁷⁴ If the claim is resisted payment does not begin until an award is made and payments, even under an award, are suspended in case of appeal until final adjudication. It thus occasionally happens that nothing is paid within two or three years after the date of injury. Such delay operates *pro tanto* to defeat the very purpose of a compensation system. Every consideration of public policy requires that relief shall be given when relief is

needed. Not reimbursement but support during disability or dependency is the object of compensation. The remedy for unreasonable delay is to be found in simpler procedure, in appropriate penalties for failure to pay compensation when and as due, in administrative pressure upon employers and insurers to make prompt payment and in the proviso that payments under a referee's award shall continue pending the outcome of an appeal.⁷⁵

Most of the states require employers either to insure their compensation liability or to make other provision for the security of deferred payments.⁷⁶ In seven states all employers under the compensation act are compelled to insure in either the state fund or private companies.⁷⁷ Elsewhere the employer is permitted, with the consent of the administrative authority, to carry his own risk. A few states require a guarantee bond from uninsured employers⁷⁸ and New York goes so far as to exact the deposit with the state insurance fund of the present value of future payments on account of death or permanent disability. Generally speaking, however, non-insured employers give no security beyond a sworn statement of assets and liabilities and are neither required to set aside reserves nor to create a trust fund. Compensation claims are, indeed, a preferred lien against unencumbered assets but the administrative boards have no means either of verifying the assets at the time of granting permission to non-insure or of making certain that such assets will be available when compensation obligations mature. In most of the states the non-insurance privilege is granted almost as a matter of course to any corporation, co-partnership, individual, borough, school district or township applying therefor. Even the statutory obligation to insure or obtain a legal exemption is very laxly enforced.

Seven states have established monopolistic funds for

compensation insurance. Of these states Nevada, North Dakota, Oregon, Washington and Wyoming oblige every employer to insure while Ohio and West Virginia permit employers under certain restrictions to carry their own risk. Nine other states—California, Colorado, Idaho, Maryland, Michigan, Montana, New York, Pennsylvania and Utah—maintain state managed funds in competition with private insurance companies. Elsewhere, private companies hold the field. Several of the competing state funds are too small for security; those of California, New York and Pennsylvania are large, prosperous and abundantly solvent.⁷⁹ The California state fund carries about one-third of the compensation insurance in that state, the Pennsylvania fund one-sixth and the New York fund one-tenth. Few other competing funds have as much as ten per cent of the premiums of their respective states. All of the state insurance funds, whether competitive or monopolistic, operate on the capitalized reserve plan. The standard of solvency of the competing funds is probably at least as high as that of private insurance companies and the net cost of insurance therein is about the same as in privately managed mutuals.⁸⁰ The assessment power of the monopolistic funds is probably sufficient to guarantee their continued solvency irrespective of the adequacy of their reserves. Most of these funds in fact appear to maintain adequate reserves and show substantial surpluses over all liabilities.⁸¹

Private insurance companies are, in all states, subject to licensing and examination by the insurance department. The requirements for licensing or admission are very low: usually \$200,000 of paid-in capital for a stock company and \$50,000 of paid-in premiums or 2,500 insured employees for a mutual. The number of private companies—stock mutual or reciprocal—licensed in one or another state as

compensation insurers probably exceeds a hundred, yet it is doubtful whether more than twenty have sufficient resources for assured solvency or a sufficient volume of premiums for economic management. All are required by law to maintain reserves which are subject to verification by the insurance department. But the legal reserves in most states are a flat percentage of premiums⁸² without regard to the sufficiency or insufficiency of premium rates or to the favorable or adverse experience of the particular insurer.⁸³ Compensation reserves are not segregated so that insufficient premiums, excessive expenses or adverse experience, whether in compensation, automobile or public liability insurance, would be equally fatal to security. The reserve laws, in fact, are so maladroitly drawn and so loosely enforced as to afford very little protection to compensation claimants. The large and well managed insurance companies are unquestionably solvent but their solvency is in no degree due to the supervision of state authorities.

Nearly half the states undertake to supervise compensation insurance rates in respect to adequacy;⁸⁴ some few add reasonableness.⁸⁵ In most of these jurisdictions, however, the supervisory authorities have neither facilities for the compilation of statistics nor any expert knowledge of insurance matters. Supervision under such circumstances is either perfunctory or meddlesome. The adequate rate laws have done much to prevent rate cutting and have thereby helped to maintain the solvency of insurance carriers and to narrow the range of competitive discrimination. But little has been accomplished in the direction of a rational system of risk classification or of sound principles of rate making and nothing at all toward the elimination of competitive waste.

To summarize this catalogue of shortcomings: the Amer-

ican compensation system does not yet include all of the United States nor does it cover railway or marine transportation, agriculture or domestic service; the scale of benefits is grossly inadequate, needlessly variable from state to state and contains many unintelligent limitations and exclusions which work a hardship out of all proportion to the monetary saving;⁸⁶ the administration of the laws permits much avoidable litigation and much unnecessary delay in the payment of claims; the prevalent form of insurance gives no sufficient security for future payments and public supervision of private insurers has failed to obtain either appropriate risk classes or reasonable rates. By comparison with any acceptable standard for the indemnity of work injuries our compensation laws are poor indeed. Measured, however, by the situation which obtained ten years ago, the advance is very great. The law of negligence and all its works has been swept into the discard and in its place has emerged the principle that industry shall bear the cost of industrial injuries. That the new principle is still very imperfectly realized in practice is less significant than its universal acceptance in theory: no far reaching reform was ever carried out until its justice and expediency had taken hold upon the general conviction. Adequate compensation benefits will be attained as fast as public opinion is educated to the necessity thereof. Already the earlier laws have repeatedly been amended upwards and the process gives every promise of continuing for at least another decade. High benefits are the prime desideratum, for all things else will follow thereupon. High benefits will enforce curative treatment, re-training and prevention; with high benefits, also, the need of efficient administration and of sound insurance at reasonable cost will be irresistibly apparent.

NOTES

¹ The principal European countries adopted workmen's compensation as follows: Germany 1884, Austria-Hungary 1887, Norway 1894, Great Britain 1897, Denmark 1898, Italy 1898, France 1898, Spain 1900, Sweden 1901, United Netherlands 1901, Russia 1903, Belgium 1903, Switzerland 1911.

² "Sic utere tuo ut alienum non laedas." See 20 Edward IV, *placita* 10 (A. D. 1481). Wigmore, *Responsibility for Tortious Acts: Its History*, in *Harvard Law Review*, Vol. VII, pp. 315, 383 and 991; *Pollock on Torts* and Holmes, *History of the Common Law*.

* Shearman and Redfield's *The Law of Negligence* and Labatt's *Employers' Liability* are the best American texts ante-dating workmen's compensation in the United States. Downey, *History of Work Accident Indemnity*, Chs. I I, I I I, and IV gives a condensed history, analysis and criticism of the common law as it stood in 1910.

⁴ "Volenti non fit injuria." Thomas vs. Quartermaine, 18 Law Reports, Queen's Bench, 685 (1887), Dynen vs. Leach, 26 Law Journal, Exchequer, N. S. 221 (1857); Labatt's *Employers' Liability*, Ch. XVII; Bohlen, *Voluntary Assumption of Risk*, in *Harvard Law Review*, Vol. XX, p. 14.

⁶ Butterfield vs. Forrester, 11 East, 60 (England, 1809); Davies vs. Mann, 10 Meeson and Welsby, 546 (England, 1842); Cooley on Torts, 3d, pp. 1457; Salmond on Torts, 2d Ed. p. 36; Schofield, *Theory of Contributory Negligence*, in *Harvard Law Review*, Vol. III, p. 263.

⁶ "A small number of able judges, devoted from varying motives to the supposed interests of the wealthy classes, and caring little for any others, boldly invented an exception to the general rule of masters' liability, by which servants were deprived of its protection"—Shearman and Redfield's *Law of Negligence*, 5th Ed., p. VI.

"The doctrine (fellow-servant) was only invented in 1837. Lord Abinger planted it; Baron Alderson watered it and the devil gave it increase."—Mr. Birrell, Secretary for Ireland, quoted in *Hansard*, 1897, Vol. XLIX, p. 692.

The fellow-servant rule was laid down by Lord Abinger in *Priestly vs. Fowler*, 3 Meeson and Welsby, 1 (England, 1837), was independently enunciated by Mr. Justice Evans in *Murray vs. South Carolina Railroad Company*, 1 McMullan, 385 (South Carolina, 1841) and was given definitive form by Chief Justice Shaw in *Farwell vs. Boston and Worcester Railroad Corporation*, 4 Metcalf, 49 (Mass. 1842).

⁷ Downey, *History of Work Accident Indemnity*, Ch. IV.

⁸ This evasion of liability was limited to some extent in certain jurisdictions by the doctrines of vice-principalship and non-delegable duties.

⁹ Of every one hundred industrial accidents fifteen go to court, seven are lost and eight won.—Boyd's *Workmen's Compensation*, p. 10.

¹⁰ For a summary of these statutes see *Twenty-second Annual Report of the United States Bureau of Labor* and *Bulletin of the United States Bureau of Labor*, Nos. 85, et seq. The statutes differed greatly in substantive provisions and in the scope of employments covered.

¹¹ For the results of employers' liability settlements see *First Report of the New York Employers' Liability Commission, 1910; Report of the Illinois Employers' Liability Commission, 1910; Report of the Wisconsin Select Committee on Industrial Insurance, 1911; Twelfth Biennial Report of the Minnesota Bureau of Labor, 1909-1910; Report of the Ohio Employers' Liability Commission, 1911; Boyd's Workmen's Compensation and Eastman's Work Accidents and the Law.*

¹² Organized 1906.

¹³ *Eastman's Work Accidents and the Law and Hard's Injured in the Course of Duty* drew largely upon the materials collected in the Pittsburgh Survey and served to bring home in striking fashion the shortcomings of the common law. *Lewis' Slate Insurance, Seager's Social Insurance, Schwedtmann and Emery's Accident Prevention and Relief* and Frankel and Dawson's *Workingmen's Insurance in Europe* popularized the information contained in the famous *Twenty-fourth Annual Report of the United States Bureau of Labor, 1909*. The book by Schwedtmann and Emery is especially notable as representing the viewpoint of employers favorable to compensation. Rubinow's *Social Insurance* (1913), still the best American work in its field, had much influence upon later opinion.

¹⁴ No more searching criticism of the common law of employers' liability could be offered than that given in Shearman and Redfield's *Law of Negligence* and Labatt's *Employers' Liability*. Pound's *The Need of a Sociological Jurisprudence*, *Green Bag*, Vol. XIX, p. 607, Walton's *Workmen's Compensation and the Theory of Professional Risk*, *Columbia Law Review*, Vol. XI, p. 36, Warner's *Employers' Liability as an Industrial Problem*, *Green Bag*, Vol. XVIII, p. 185 and Bohlen's *Voluntary Assumption of Risk*, *Harvard Law Review*, Vol. XX, p. 14, are notable expressions of advanced professional opinion. It is especially significant that every court of last resort (save only the peculiarly benighted New York Court of Appeals) welcomed the compensation laws and made haste to uphold their constitutionality.

¹⁵ Georgia Day Address at the Jamestown Exposition—*Official Blue Book of the Jamestown Ter-Centennial Exposition, 1907*, pp. 194-197.

¹⁶ No fewer than twenty-five commissions were appointed by the several states and by the Federal government in the three years 1909-1911. Reports of exceptional value were made by the commissions of New York, Massachusetts, Ohio, Wisconsin, Illinois and the United States.

¹⁷ For a summary of the work of the early employers' liability commissions see Downey, *History of Work Accident Indemnity*, Ch. VI.

¹⁸ Missouri, Arkansas, North Carolina, South Carolina, Mississippi and Florida and the District of Columbia. Missouri, the only state of much industrial importance which still adheres to the liability system, submitted a compensation act to popular referendum twice and it was defeated both times (1920 and 1922).

Compensation laws have been enacted as follows:

1911	1913	1915	1918
Washington	Texas	Wyoming	Virginia
Kansas	West Virginia	Montana	
Nevada	Minnesota	Colorado	1919
New Jersey	Connecticut	Indiana	
California	Oregon	Oklahoma	North Dakota
New Hampshire	Iowa	Maine	Tennessee
Wisconsin	Nebraska	Pennsylvania	Alabama
Illinois			
Ohio	1914	1916	1920
Massachusetts			
	New York	Kentucky	Georgia
1912	Maryland		
	Louisiana	1917	
Michigan			
Arizona		New Mexico	
Rhode Island		South Dakota	
		Utah	
		Idaho	
		Delaware	

¹⁹ The Dominion of Canada resembles the United States in its tardy acceptance of industrial responsibility for work injuries and in the general features of its compensation system. The several provinces established workmen's compensation as follows: British Columbia, 1902, Alberta 1908, Quebec 1909, Manitoba 1910, Nova Scotia 1910, Saskatchewan 1911, Ontario 1914, New Brunswick 1918.

²⁰ There is a Federal Employers' Liability Act which mitigates the common-law defences but leaves the principle of no liability without fault in full effect.

²¹ *Southern Pacific Company vs. Jensen* (1917), 37 Supreme Court Reporter, 524 (244 U. S. 205); *Knickerbocker Ice Company vs. Stewart* (1920), 40 Supreme Court Reporter, 438 (253 U. S. 149).

^{21a} The Act of Congress (42 Stat. 634) amending the Judicial Code, was declared unconstitutional by the Federal Court of the Southern District of Alabama in *Farrel vs. Waterman S. S. Co.*, 286 Fed. 284.

²² Thirty-two states expressly exclude farm labor and domestic service; most of the others either exempt all small employers or omit domestic and agricultural labor from the list of employments covered.

²³ Fewer than four employees in Colorado, New Mexico and New York; fewer than three in Kentucky, Oklahoma, Texas, Utah and Wisconsin; fewer than five in Connecticut, Delaware, Kansas, New Hampshire and Ohio; fewer than six in Maine and Rhode Island; fewer than ten in Georgia and Tennessee; fewer than eleven in Vermont and Virginia; fewer than sixteen in Alabama.

²⁴ Alabama, Arizona, Delaware, Georgia, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, New Hampshire, New Mexico, Oklahoma;

Tennessee, Texas, Vermont, Washington, and Wyoming exclude public employees in whole or in part.

²⁵ The New York act, *e. g.*, covers retail stores, cigar makers and even clerical employees. Maine distinguishes itself by excluding logging and Tennessee by excluding coal mines.

²⁶ California, Connecticut, Massachusetts, North Dakota, Wisconsin and the Federal Government include diseases in the definition of "injury arising out of the employment." In Minnesota, New York and Ohio the compensable diseases are limited to an enumerated list.

²⁷ For the effect of this double restriction see above, Ch. III.

²⁸ This statement is a rough estimate from the occupational census. Only a laborious and detailed computation by states would give a close approximation.

²⁹ Arizona, California, Idaho, Illinois, Maryland, New York, North Dakota, Ohio, Oklahoma, Utah, Washington and Wyoming have compulsory statutes. The Indiana law is compulsory as to coal mines.

³⁰ *Ives vs. South Buffalo Railway Company*, 201 New York 271 (1911). "When our Constitutions were adopted it was the law of the land that no man who was without fault or negligence could be held liable in damages for injuries sustained by another. . . . Due process of law . . . means . . . that everyman's right to life, liberty and property is to be disposed of in accordance with those ancient and fundamental principles which were in existence when our Constitutions were adopted."—Mr. Justice Werner, p. 293.

³¹ Early leading cases are: *Opinion of the Justices of the Supreme Court of Judicature*, 96 *Northeastern*, 308 (Mass. 1911), *Borgnis et als. vs. Falk Co.*, 133 *Northwestern*, 209 (Wisconsin, 1911), *State exrd. Davis-Smith vs. Clausen*, 117 *Pacific*, 1104 (Washington, 1911), *State ex rel. Yaple vs. Creamer*, 97 *Northeastern* p. 602 (Ohio, 1912), *Employers' Liability Cases*, 32 *Supreme Court Reporter* (United States, 1912).

³² See Wambaugh, *Workmen's Compensation Acts: Their Theory and Their Constitutionality*, *Harvard Law Review*, Vol. XXV, p. 129; Mercer's *Constitutionality of Workmen's Compensation Acts* (pamphlet); Harper, *Workmen's Compensation in Illinois*, *Illinois Law Review*, Vol. VI, pp. 170-188, 255-261; the briefs filed by Launcelot Packer, Frank B. Kellog and Ernst Freund for the United States Employers' Liability and Workmen's Compensation Commission, *Senate Document No. 90*, Vol. II, Sixty-second Congress, first session, and the protest against the Ives decision signed by fourteen teachers of constitutional law in leading universities, *The Outlook*, July 29, 1911, p. 709.

³³ Some of the early laws provided for affirmative acceptance by the employer. The device of conclusively presuming acceptance unless the employer positively rejects the act has proven much more effective.

³⁴ But in Indiana it was found necessary to make the act compulsory as to coal mining because the coal operators had generally rejected compensation.

³⁵ No two Acts are precisely alike in benefits and all the Acts are so frequently amended that no useful purpose would be served by a detailed analysis in a general treatise of this kind. All that is attempted in the text is a summary statement of the more important features as of the close of

the legislative year 1921. Texts of the laws have been published from time to time by the United States Bureau of Labor. A useful but incomplete tabular analysis was issued in 1921 by the National Workmen's Compensation Service Bureau.

³⁶ Arizona, Colorado, Connecticut, Delaware, Georgia, Montana, New Hampshire, New Mexico, Rhode Island, Tennessee, Vermont, and Virginia.

³⁷ Alabama, Iowa, Kansas, Louisiana, Michigan, Nevada, Pennsylvania, Texas, and Utah.

³⁸ California, Illinois, Kentucky, and Wisconsin.

³⁹ Maine, Maryland, Massachusetts, Minnesota, Nebraska, New Jersey, New York, North Dakota, Ohio, Oklahoma, and West Virginia.

The nominal rate is 55 per cent in Idaho, Indiana and South Dakota. In Alabama, Nevada, Oregon, Washington, and Wyoming the disability benefit varies with number of dependents. In Nevada, Oregon, Washington and Wyoming benefits are payable monthly and fixed at a monthly rate. In Washington and Wyoming the monthly rate is independent of wage.

⁴⁰ Alaska and Arizona.

⁴¹ Colorado, Georgia, New Mexico, Pennsylvania, and Washington (\$52.50 monthly).

The weekly maximum is \$12.50 in Montana, \$13.20 in Indiana and \$14 in Michigan.

⁴² Alabama, Delaware, Iowa, Kansas, Nebraska, South Dakota, Tennessee, Texas, and Vermont.

⁴³ \$16 in Idaho, Maine, Massachusetts, Rhode Island, West Virginia and Utah; \$17 in Illinois and New Jersey; \$18 in Connecticut, Louisiana, Maryland, and Oklahoma; \$18.75 in Ohio; \$18.20 in Wisconsin; \$72 monthly in Nevada.

⁴⁴ California \$20.83, Minnesota \$20, New York \$20, North Dakota \$20, Texas \$20, Oregon \$97 monthly, Wyoming \$90 monthly.

⁴⁵ In Pennsylvania with a nominal rate of 60 per cent of wages and a weekly maximum of \$12, the effective ratio of weekly compensation to weekly wages in 1920 was 32 per cent for bituminous miners, 40 per cent for anthracite mine workers and 42 per cent for factory employees. Even in New York the weekly maximum of \$20 probably reduces the average effective rate of compensation to 60 per cent of wages.

⁴⁶ Two weeks in Alabama, Arizona, Delaware, Iowa, Montana, and New York; one week in California, Connecticut, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, North Dakota, Ohio, Rhode Island, Texas, Vermont, West Virginia, Wisconsin, and Wyoming; ten days in Colorado, New Jersey, New Mexico, Pennsylvania, South Dakota and Virginia; three days in Maryland, Utah and the Federal Government. Oregon has no waiting period.

Twenty-one states provide that compensation shall revert to the date of injury if disability lasts more than a specified time—four weeks in Alabama, Connecticut, Delaware, Georgia, Illinois, Minnesota, Ohio, and Washington; six weeks in Louisiana, Michigan, Montana, Nebraska, South Dakota, Tennessee and Virginia; two weeks in Arizona, three weeks in Okla-

homa and Wisconsin, five weeks in Iowa and seven weeks in New York and New Jersey.

⁴⁷ In New York the two-week waiting period and the weekly maximum of \$20 serves to reduce by one-half the nominal rate of compensation for temporary disability, which is $66\frac{2}{3}$ per cent of wages.

⁴⁸ California, 65 per cent of wages, not more than \$20.83 weekly, for 240 weeks, thereafter 40 per cent of wages, not more than \$12.80 weekly, for life; Idaho, 55 % of wages for 400 weeks, thereafter \$6 per week for life; Illinois, 65 per cent of wages, not more than \$17 weekly, for 320 weeks, thereafter not more than \$25 nor less than \$10 *monthly*; Montana, \$12.50 weekly for 500 weeks and \$5 weekly thereafter; Utah, 60 per cent of wages (weekly maximum \$16) for five years, thereafter 45 per cent of wages but not more than \$12 per week.

⁴⁹ 300 weeks in New Hampshire, 260 weeks in Vermont, 350 weeks in Georgia, 401 weeks in Texas, 400 weeks in Iowa, Louisiana, New Jersey and North Dakota, 416 weeks in Kansas and Kentucky, 475 weeks in Delaware, 500 weeks in Indiana, Maine, Massachusetts, Michigan, Oklahoma, Pennsylvania, Rhode Island and Virginia, ten years in Connecticut and New Mexico, 550 weeks in Alabama and Tennessee, 900 weeks in Wisconsin.

⁵⁰ \$4,000 in Arizona, Delaware, Massachusetts and Vermont, \$4,500 in Virginia, \$5,000 in Alabama, Georgia, Indiana, Maryland, Pennsylvania, Rhode Island and Tennessee, \$6,000 in Kentucky and Maine, \$7,000 in Michigan, \$10,000 in Minnesota, \$3,000 in South Dakota.

⁵¹ Typical schedules are:

MEMBER (Loss or Loss of Use)	COMPENSATION IN WEEKS					
	New York	Wisconsin [*]	Minnesota	Pennsylvania	New Jersey	Colorado
Arm—shoulder.	312	446	200	215	200	208
Arm—elbow.	244	200	175	175	150	139
Hand.	244	297	175	175	150	104
Leg—hip.	288	446	200	215	175	208
Foot.	205	223	150	150	125	104
Eye.	128	178	100	125	100	104
Hearing—both ears. . .	150	297	156	—	160	139
Thumb—entire.	60	89	60	60	60	35
Thumb—one phalanx . .	30	30	30	—	30	18
Index—entire.	46	35	35	35	35	18
Little finger—entire. . .	15	15	15	15	15	9
Great toe—entire. . . .	38	25	30	—	30	18
Lesser toe—entire. . . .	16	8	10	—	10	4

* At age 35. The compensation for major permanent disability varies with age. Wisconsin adopted in 1923 the recommendations of the Committee on Statistics of the I. A. I. A. B. C.

⁵² Massachusetts provides a small specific indemnity for loss or loss of use of enumerated members—e. g., \$500 for loss of hand—and *in addition* compensation during 500 weeks on the basis of loss of earnings. In most of the acts the loss of earnings clause applies only to injuries not enumerated in the schedule. In Wisconsin, New York and South Dakota an impairment of an enumerated member is compensated at such proportion of the specific indemnity for loss thereof as the degree of impairment bears to total loss of use.

⁵³ Cf. Ch. III, above.

Impairments of members, it is well known, are more numerous than either dismemberments or complete loss of use of the same member. Yet of 3,445 major permanent partial disabilities in Pennsylvania experience 1,127 were dismemberments, 1,951 were rated as complete loss of use of hand, arm, leg, foot or eye, and only 367 were impairments of these members compensated under the loss of earnings clause. Doubtless some serious impairments were rated as complete loss of use by a liberal interpretation of the statutory language, but many others were compensated only as temporary disabilities. Similarly in Ohio the cases compensated under the specific indemnity schedule for loss or complete loss of use of member outnumber the cases of functional impairment by more than three to one. And compensation on 278 of 359 permanent impairments examined by the writer was stopped before the expiration of the maximum allowable period. The aggregate compensation paid on these 278 cases was about one-fifth of the amount payable during the maximum period allowed by law.

⁵⁴ Children's pensions run to age eighteen in New York, Nevada and North Dakota, to sixteen in Oregon, Washington, and West Virginia, and age fifteen in Wisconsin.

⁵⁵ In Pennsylvania the death benefit runs 300 weeks but payments at a reduced rate continue beyond the 300 weeks until the youngest child is sixteen years of age. Somewhat analogous provisions are found in Idaho (400 weeks, and to age eighteen). Wyoming provides a lump sum *plus* \$10 monthly to each child under sixteen (in the case of daughters, up to age of eighteen) subject to a maximum total of \$8,000.

⁵⁶ 260 weeks in Vermont, 285 weeks in Delaware, 300 weeks in Alabama, Georgia, Indiana, Iowa, Louisiana, Maine, Michigan, New Mexico, Pennsylvania, Rhode Island and Virginia; 312 weeks in Colorado, Connecticut and Utah; 400 weeks in Arizona, Idaho, Maryland (416), Montana, Ohio (416), and Tennessee, 300 to 400 weeks: Kentucky 335, Nebraska 350, Texas 360, and 500 weeks in Massachusetts and New Jersey.

California, Kansas, and New Hampshire specify three years' annual earnings payable in weekly installments; Illinois, South Dakota, and Wisconsin specify four times the average annual wage, payable in weekly installments.

⁵⁷ The maximum total death benefit is \$3,000 in New Hampshire and Rhode Island, \$3,500 in Vermont, \$3,600 in New Jersey, \$3,800 in Kansas, \$4,250 in Illinois, \$4,000 in Arizona, Georgia, Kentucky, Maine and Massachusetts, \$4,200 in Michigan, \$4,400 in Tennessee, \$4,500 in Iowa and Virginia, \$5,000 in California, Alabama, Indiana, Maryland, Montana,

and Utah, \$5,250 in Nebraska, \$5,400 in Louisiana, New Mexico and Texas, \$6,500, in Ohio, \$7,500 in Minnesota, \$8,000 in Wyoming.

The total maximum operates to reduce the actual period of compensation from 500 weeks to 250 weeks in Massachusetts, from 416 to 272 in Maryland, from 300 to 250 in Maine, from 300 to 172 in Rhode Island and 335 to 267 in Kentucky.

⁵⁸ Alabama, Delaware, Idaho, Illinois, Louisiana, Nevada, New Jersey, New Mexico, New York, North Dakota, Oregon, Pennsylvania, Tennessee, Vermont, Washington, West Virginia, Wisconsin and Wyoming.

⁵⁹ In Pennsylvania the widow's pension is \$8 weekly, while the pension to one or two children is \$6 and to a widow and child after 300 weeks is \$3. In New York the widow's pension is 30 per cent of wages (maximum \$9 weekly), and the pension to one child is 15 per cent, but not more than \$4.50 per week.

⁶⁰ See *Statistical Analysis of Workmen's Compensation Insurance in Pennsylvania, 1916-1920*, Table X.

⁶¹ Nearly one-fifth of all industrial widows are past fifty years of age.—*Ibid*, Table XII.

⁶² Arizona.

⁶³ New Hampshire, Massachusetts, Montana, Vermont and New Mexico (10 days).

⁶⁴ Delaware, Georgia, Indiana, Iowa, Maine, Pennsylvania, Tennessee, and Texas, (4 weeks).

⁶⁵ Alabama, Colorado, Illinois, Kansas (50 days), Oklahoma, Rhode Island and Virginia.

⁶⁶ Kentucky, Michigan, Minnesota, Nevada, South Dakota, and Wisconsin.

⁶⁷ The limit is \$50 in New Jersey, \$100 in Alabama, Delaware, Georgia, Iowa, Kentucky, Maine, Montana, Oklahoma, Pennsylvania, Tennessee and Vermont; \$150 in Kansas, New Mexico and South Dakota; \$200 in Colorado, Illinois, Ohio, Rhode Island and Wyoming; \$250 in Louisiana and Oregon; \$300 in Maryland; \$500 in Utah; \$900 in West Virginia. Several states—e. g., Delaware, Massachusetts, Minnesota, New Jersey and Ohio—authorize the administrative board to exceed the statutory limit in special cases but this proviso is of little practical value.

⁶⁸ Alabama, Arizona, Kansas, Louisiana, New Hampshire, New Mexico, Rhode Island, Tennessee and Wyoming.

⁶⁹ The term of office is usually four or six years and few commissions are reappointed. It is not unusual, indeed, for the entire board to be changed within the minimum time permitted by law. Pennsylvania, with a board of three, has had five commissioners in six years, Delaware has had five in four years, Ohio six in ten years, Wisconsin eight in ten years, Washington fourteen in eleven years. In New York nine appointments were made in six years to maintain a board of five.

⁷⁰ By a subtle and characteristic distinction the court does not undertake to say whether the board drew the correct conclusion from the evidence before it but only whether there was competent evidence from which the board's conclusion might reasonably have been drawn.—See, e. g., McCauley

vs. Imperial Woolen Co., 261 Penna. 312 (1918) and Kelly vs. Watson Coal Co., 272 Penna. 39 (1922).

The actual, as distinguished from the formally stated grounds of court review are much the same in most of the states.

⁷¹ See, e. g., Rules of Pennsylvania Compensation Board.

⁷² Under actually existing conditions the services of an attorney are often necessary to obtain compensation in border line cases—especially in cases of recurrent disability, of deferred death remotely resulting from an injury, and of those diseases which by a somewhat tenuous construction, are brought within the definition of an "injury by accident." But attorneys are employed by ignorant claimants in hundreds of cases which present no close question of law or facts. The fees are, in most states subject to the board's approval, and are commonly limited to ten per cent. But ten per cent of a death or permanent disability benefit is an ample temptation to shyster lawyers in the great cities. Very often, moreover, the award is made to the attorney for the benefit of the claimants, a practice which promotes extortion. To make matters worse, hundreds of lump sum commutations are granted for no better reason than to make sure of the attorney's fee. Whence it has come to pass that "ambulance chasers" and their "runners " do a thriving business in such cities as New York, Philadelphia and Chicago, preying at once upon legitimate claimants and upon employers and insurance carriers by means of fraudulent claims.

⁷³ In 114 such cases investigated by Jeremiah F. Connor for the governor of New York the compromise settlements made by insurance carriers totaled \$13,712 while the amount due under the law, as determined by re-adjudication, was \$52,280. Connor Report of Investigation . . . in *Relation to the Management of the State Industrial Commissions*, Nov., 1919, p. 47.

⁷⁴ The average interval between accident and first payment appears to be greater than the average duration of temporary disability. Under a one-week waiting period few first payments are made within twenty days after injury; under a ten-day waiting period few such payments are made within the first month of disability. In Pennsylvania, first payment is made within one month after death in about one-third of the fatal cases, within two months in about 60 per cent of the cases and within three months in nearly three-fourths of the cases. Delays of three months or more are perhaps unavoidable in some 25 per cent of the fatal cases because of disputed liability, non-residence of dependents, doubtful dependency, etc.; but it would be easy to begin payment within a month after death in at least two-thirds of the cases.

See *Actuarial Audit of the Ohio State Insurance Fund*, 1919, the *Connor Reports*, u. s., and unpublished studies issued in mimeograph form by the Industrial Commission of Illinois and the Workmen's Compensation Bureau of Pennsylvania. Also papers by Powers Hapgood and Carl Hookstadt in *Papers and Proceedings of the Thirty-Fourth Annual Meeting of the American Economic Association*, pp. 153-161 and by Carl Hookstadt in (U. S.) *Monthly Labor Review*, Dec, 1920, pp. 135-156.

⁷⁵ See above, Ch. IV.

⁷⁶ Only Alabama, Arizona and Kansas make no such requirement.

⁷⁷ Massachusetts, Nevada, North Dakota, Oregon, Texas, Washington and Wyoming.

⁷⁸ The curious and contradictory term "self-insurer" is properly used to designate an employer who is legally authorized to carry his own risk.

In Ohio non-insured employers must pay to the state fund 5 per cent of the premiums which they would pay if insured. In West Virginia such employers contribute to the management expenses and catastrophe reserve of the state fund.

⁷⁹ The Pennsylvania state fund quadrupled its premium volume in the five years 1916-1920. At the close of 1921 this fund had a net surplus of more than **\$2,500,000**,

⁸⁰ The Pennsylvania state fund, e. g., charges 90 per cent of the stock company rates and pays a regular dividend of 15 per cent. Many private mutuals pay regular dividends of 20 or 25 per cent; some charge no per cent of stock company rates and pay dividends of 30 per cent.

⁸¹ The clearest financial statements of monopolistic funds are those put out by Nevada and Oregon. The Ohio and West Virginia funds give only meager and general information in their published reports.

⁸² The Convention Reserve Law of 1919, Recommended by the National Convention of Insurance Commissioners and adopted by most of the states, defines the legal reserve on policies issued in the three years next preceding the date of valuation as 65 per cent of premiums earned less losses and claim expenses actually paid. Since claim expenses average at least 6 per cent, the net reserve is 59 per cent as against an expected loss ratio of 62 per cent in the normal premium rates. Earned premiums for the last policy year are habitually and often grossly underestimated, whereby reserves are further impaired. Apart from this intended inadequacy, the whole statutory basis of reserves is fundamentally unsound. Percentage of premiums would be a proper basis of reserves if—(a) the percentage equalled normal expected losses, (b) rates were universally adequate, (c) all insurers collected the same rates, (d) no company experienced a loss ratio greater than the average or had a higher than average claim expense. Since each and all of these assumptions is patently contrary to fact, the Convention Reserve Law has no tendency to maintain the solvency of cut rate or extravagantly managed companies. It is, of course, just these companies which need supervision in respect to reserves.

⁸³ A company may be legally solvent despite the known insufficiency of its assets to cover liabilities. Most of the failures among stock companies have been due to persistent rate-cutting with resultant impairment of reserves. Suppose, e. g., that the actual loss ratio at conference rates is 60 per cent. A company which writes at 50 per cent of manual rates would presumably experience a loss ratio of 100 per cent. Yet such a company would be legally solvent so long as it maintained reserves equal to 65 per cent of its own premiums, less losses and claim expenses actually paid.

³⁴ Alabama, California, Colorado, Delaware, Georgia, Idaho, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, Okla-

homa, Pennsylvania, South Dakota, Texas, Tennessee, Utah, Vermont, Virginia and Wisconsin. Of these states Massachusetts, New York, New Jersey, Pennsylvania, Wisconsin, Minnesota and California are equipped to exercise effective supervision. Elsewhere the rate manuals are officially filed but are subject to no intelligent scrutiny and are in practice flagrantly disregarded.

³⁵ Georgia, Kentucky, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New Mexico and Virginia.

³⁶ Such, *e. g.*, as the requirement that the injury shall both arise out of and occur in the course of the employment, the exclusion of occupational diseases and of casual employees, the elaborate definitions injected to exclude hernias from the category of injuries, the time and money limits upon medical aid, etc.

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143; legal aspects of employers' liability laws, by J. Mayhew Wainwright, pp. 144-150; a compensation law and private justice, by P. Tecumseh Sherman, pp. 151-158; an argument against liability, by Walter S. Nichols, pp. 159-165.

BOYD, JAMES HARRINGTON. *Treatise on the Law of Compensation for Injuries to Workmen under Modern Industrial Statutes*. Indianapolis, Bobbs-Merrill, C1913. 1622 p.

Following chapters outlining the distinctions between the common law, employers' liability, workmen's compensation, etc., and the history of the development of workmen's compensation in the United States and in foreign countries, there are chapters on the separate state laws which had been enacted up to 1912.

BRADBURY, HARRY B. *Workmen's Compensation Law*. New York, Banks Law Pub. Co., 1917. clv. 1285 p.

A discussion of judicial interpretation of the law. Includes, "A reference to every reported American case" and, "A discussion of all the important British and Canadian cases." The decisions of the various accident boards and industrial commissions are also included.

BUTTERWORTH'S WORKMEN'S COMPENSATION CASES; being a continuation of "Workmen's compensation cases." Vols. I-IX, edited by the late R. M. Minton-Senhouse,—containing reports of cases decided under the workmen's compensation acts during the period September, 1907—, ed. by His Honour Judge Ruegg and F. J. Coltman, Esq. V. I. London, Butterworth, 1909.

Includes Scottish and Irish cases and a selection of the more important decisions of the High Courts of Canada appears in an appendix. See *Workmen's Compensation Cases, 1898-1907*.

CHARTERS, JOHN. *Judicial Interpretations of the Law relating to Workmen's Compensation*. London, Butterworth, 1915. L. 753 P.

CLARK, L. D. *Decisions of Courts and Opinions Affecting Labor, 1912-20*. (U. S. Bureau of labor statistics. Labor laws of the United States series. Bulletins 112, 152, 169, 189, 224, 246, 258, 290, 309 and 344.) Prior to 1912, decisions "appeared in practically every issue of the bi-monthly bulletins, ending with No. 100."

DAWBARN, CLIMENSON YELVERTON CHARLES. *Employers' Liability to their Servants at Common Law, and under the Employers' Liability Act, 1880, and the Workmen's Compensation Act, 1906, 4th edition*. London, Sweet and Maxwell, 1911. XXIX, 714, 34 p.

———. *Workmen's Compensation Appeals, 1910-1911*. A critical commentary on the workmen's compensation case law for the

past legal year and brought up to date to the time of publication. London, Sweet and Maxwell, 1912. 128 p.

DOSHER, NICHOLAS H. *Manual of Compensation Law, State and Federal*. Louisville, Baldwin Law Book Co., 1917. 548 p.

Decisions of courts of last resort and some of those of boards or commissions grouped for easy reference. The text of the Federal act of 1916 is given with annotations and decisions of the Solicitor for the Department of Labor.

HARPER, SAMUEL ALAIN. *Law of Workmen's Compensation; the Workmen's Compensation Act with Discussion and Annotations, Tables and Forms*. 2d ed., Chicago, Callaghan and Co., 1920. 697 p.

"While the Illinois Act is used as a text for the discussion of the various subjects embraced in the broad title of the work, and all important Illinois cases are cited, the constant purpose has been to make the book quite as useful in other states, the important decisions of whose courts have likewise been fully cited, and whose statutes are very similar, in their more important provisions, to the law of Illinois."

Author's preface.

HAYWARD, PERCY ROY. *Compensation for Injuries to Canadian Workmen*. Toronto, Canada Law Book Co., 1918. 55 p. (Reprinted from Canada Law Journal.)

Traces the development of compensation legislation. Analyzes acts of the various Provinces.

HONNOLD, ARTHUR B. *Treatise on the American and English Workmen's Compensation Laws as Interpreted by the Courts and Tribunals Vested with the Power of Administering and Enforcing Same, with Supplement*. Kansas City, Vernon Law Book Co., 1918. 2 v.

KNOCKER, DOUGLAS. *Accidents in Their Medico-Legal Aspect, by Leading Medical and Surgical Authorities*. London, Bailliere, Tindall and Cox, 1910. XXVII, 1254 p.

Designed as a reference book for lawyers when differences of opinion are expressed by medical witnesses, or for use when expert medical opinion is not obtainable. The book is divided into three parts: legal, medical, case guide. The legal part is intended to "give to medical men a short statement of the law on matters of interest to them"; to lawyers a line of cases which will lead them to any point in the law of accidents. The medical part is for assistance to lawyers in understanding the consequences of accidents. The object of the case guide is, "(1) To afford lawyers numerous instances of cases where medical points have arisen and been thrashed out, in order to assist them in advising upon or

conducting similar cases. (2) To give, as far as possible, to **all** engaged in litigation some idea of the amount of damages which will probably be recovered. (3) To assist doctors in estimating the probable duration of incapacity after injury."

KNOWLES, C. M. *Law Relating to Compensation for Injuries to Workmen*; being an exposition of the workmen's compensation act, 1906, together with the workmen's compensation (Anglo-French convention) act, 1909, and certain relevant provisions of the National insurance act, 1911, and including the workmen's compensation rules and forms and all other appropriate statutory rules and orders. 3d edition. London, Stevens, 1912. L X I, 590 p.

LABATT, CHARLES B. *Commentaries on the law of master and servant including the modern laws on workmen's compensation, arbitration, employers' liability, etc.* Rochester, Lawyers' Coöperative Pub. Co. 1913. 8 v.

LAWS, EDWARD THORNTON HILL. *Law of Compensation for Industrial Diseases*, being an annotation of section 8 of the workmen's compensation act, 1906, with chapters upon the powers and duties of certifying surgeons and medical referees: and the rules, regulations and forms relevant thereto and including a special treatise upon every disease to which the act now applies, together with the special rules or regulations made under the Factory and Workshop acts for the prevention of such diseases. London, Stevens, 1909, X I I, 273, 18 p.

MCKENDRICK, ARCHIBALD. *Back Injuries and Their Significance under the Workmen's Compensation and Other Acts.* Edinburgh, Livingstone, 1916. 173 p.

"This little book is offered to the medical and legal professions as an honest attempt to throw some light into the existing darkness, and to suggest some practical methods of testing the genuineness or otherwise of complaints made. As it is in the minor, rather than the major injuries that difficulty as to diagnosis and doubt as to treatment chiefly arise, more attention has been devoted to the common everyday cases than to the rarer and more severe forms of injury." Author's preface.

NEGLIGENCE AND COMPENSATION CASES ANNOTATED; *the Workmen's Compensation, Employers' Liability and Current Negligence Cases Decided in the Federal Courts of the United States, the Courts of Last Resort of all the States and Territories and of the English and Canadian Courts, with Pleadings and Forms*, by the publishers' editorial staff. V. I. Chicago, Callaghan and Co., 1912.

This series begins at the point where the American Negligence Reports stopped, and contains, "all cases on the broad subject of negligence, including cases of personal injuries, injuries to property, decided by the higher courts, all cases dealing with employers' liability insurance contracts, employers' or industrial insurance statutes and workmen's compensation acts. The arrangement of each volume is as follows: table of reported cases, table of cited cases, table of cases classified according to the facts, cumulative index to notes, index to pleadings, and general index.

RANDOLPH, CARMAN F. *Brief on the Legal Aspects of Systematic Compensation for Industrial Accidents.* United States Senate Document 338. Report of Employers' Liability, and Workmen's Compensation Commission, v. 2. Washington, Gov't Print. Off., 1912.

RUEGG, ALFRED HENRY. *EmployerS' Liability Act, 1880, and the Workmen's Compensation Act, 1906*, with the statutes relating to and cases decided on the previous workmen's compensation acts in England, Scotland, and Ireland; the county court rules of procedure under the act of 1906; the Home office regulations and forms; together with notes and cases decided in the Canadian courts, and an appendix of Canadian Statutes. Canadian notes by F. A. C. Redden, 8th ed. London, Butterworth, 1910. LXXIII, 980, 64 p.

Contains all important cases considered in the superior courts of England, Scotland and Ireland and "An examination of the principles upon which they are founded, or which are deducible from them."

SCHNEIDER, WILLIAM R. *Law of Workmen's Compensation. Rules of Procedure, Tables, Forms, Synopses of Acts.* St. Louis, Thomas Law Book Co., 1922. 2 v.

Under each point are cited all the American appellate court cases on the subject, with many British, Canadian, board and commission decisions. Synopses of the acts as amended to 1921, are included.

SHEARMAN, T. G., and REDFIELD, A. A. *Treatise on the Law of Negligence.* 6th ed. New York, Baker, Voorhis, 1913. 3 v.

"Originally published in 1868. Pioneer work on the subject and quickly attained a high position with the bench and bar, a position it has ever since held by successive editions presenting the expansion and modification of the law by legislation and judicial decision on the subject treated."

Workmen's compensation cases not given, "because the pur-

pose of such acts is to eliminate questions of negligence in the relation of master and servant from judicial discussion and determination."

Robert G. Street
Preface, 6th ed., 1913.

UNITED STATES. EMPLOYERS' LIABILITY AND WORKMEN'S COMPENSATION COMMISSION. *Workmen's Compensation and Employers' Liability*. Opinions of the state supreme courts of New York, Massachusetts, Washington, Montana, Wisconsin and Ohio, construing the workmen's compensation and industrial insurance laws of these states and the Supreme Court of the United States in the second employers' liability cases January 15, 1912. 62d Congress, 2d session. Senate document No. 475.

UNITED STATES. SOLICITOR OF THE DEPARTMENT OF LABOR. Opinions of the solicitor for the Department of labor dealing with workmen's compensation under the act of Congress granting to certain employees of the United States the right to receive from it compensation for injuries sustained in the course of their employment, approved May 30, 1908, with the amendments thereto, from August, 1908, to April, 1915. Washington, Government Printing Office, 1915. 811 p.

WORKMEN'S COMPENSATION CASES, 1898 to 1907; being reports of cases decided under the workmen's compensation act, principally taken from the *Times Law Reports* and the *Law Times Reports*. Ed. by R. M. Minton-Senhouse. London, Butterworth, 1899-1908. 9 v.

Continued by Butterworth's Workmen's Compensation Cases, which see.

The following is a partial list of publications containing decisions for individual states:

CALIFORNIA. INDUSTRIAL ACCIDENT BOARD AND INDUSTRIAL ACCIDENT COMMISSION. *Report of decisions*. 1915.

CONNECTICUT. COMPENSATION COMMISSIONERS. *Compendium of Awards*. 1914- .

DELAWARE. INDUSTRIAL ACCIDENT BOARD. *Digest of the Most Important Cases under the Workmen's Compensation Act*. 1918.

IOWA. WORKMEN'S COMPENSATION SERVICE. *Report and Digest of Decisions*.

MASSACHUSETTS. INDUSTRIAL ACCIDENT BOARD. *Reports of Cases under the Workmen's Compensation Act*. July, 1912.

MINNESOTA. DEPARTMENT OF LABOR AND INDUSTRIES. *Court Decisions, Attorney General's Opinions, Department of Labor Advice, Relative to the Workmen's Compensation Act*.

- NEW YORK STATE. INDUSTRIAL COMMISSION. *Court Decisions*. 1914- .
- OHIO. LAWS, STATUTES, ETC. ***Ohio Workmen's Compensation Act and Decisions of the Ohio Industrial Commission with Reference to Negligence and Compensation Cases Annotated***. Chicago, Callaghan, 1918. 16 v.
- PENNSYLVANIA. DEPARTMENT REPORTS. ***Workmen's Compensation Supplement***. 1915- .
- PENNSYLVANIA. WORKMEN'S COMPENSATION BOARD. ***Decisions of the Courts of Pennsylvania in Workmen's Compensation Cases***. 1916- .
- PENNSYLVANIA. WORKMEN'S COMPENSATION BOARD. ***Decisions of the Pennsylvania Workmen's Compensation Board***. 1916.
- UTAH. INDUSTRIAL COMMISSION. *Report of Decisions*.
- VIRGINIA. INDUSTRIAL COMMISSION. *Opinions*.

VI. ADMINISTRATION OF COMPENSATION

- AMERICAN ASSOCIATION FOR LABOR LEGISLATION. *American Labor Legislation Review*, v. 5. No. 1. March, 1915.

This number contains the proceedings of the Eighth Annual Meeting of the Association. Two sessions were devoted to legislative and administrative problems. The papers dealing particularly with administration are as follows: Three years under the New Jersey workmen's compensation law; operation of the New York workmen's compensation law, by John Mitchell; administration by courts or by commission, by Wallace Yapple.

- AMERICAN FEDERATION OF LABOR AND NAT'L CIVIC FEDERATION, COMMISSION OF. ***Workmen's Compensation; Report upon Operation of State Laws***. Commission's findings, views of employers and workmen, digest of laws, rules of state boards of award. Washington, Gov't Print. Off., 1914. 255 p. (Senate Document, No. 419.)

Facts with regard to the operation of workmen's compensation laws, intended for the use of the Civic Federation in drafting a model law.

- BLANCHARD, RALPH H. ***Liability and Compensation Insurance***. Ch. XI. New York, Appleton, 1917.
- BRADBURY, HARRY B. ***Workmen's Compensation Law***. 3d ed. Ch. XX. New York, Banks Law Pub. Co., 1917.
- CLARK, LINDLEY D. ***Medical and Surgical Provisions in Compensation Law and Administration***. United States Bureau of Labor Statistics. *Monthly Labor Review*. October, 1918. Pp. 215-228.

Compares the provisions of the compensation acts of the United States under the following captions: Requirements as to medical and surgical aid; adequacy of provisions; return to work; refusing treatment; choice of physicians; the physician as a factor in administration.

CONYNGTON, MARY K. *Effect of Workmen's Compensation Laws in Diminishing the Necessity of Industrial Employment of Women and Children*. Pp. 34, 68, 102. Washington, Gov't Print. Off., 1917.

Administration of the law in Connecticut, Ohio and Pennsylvania.

DOWNEY, E. H. "Public supervision of workmen's compensation insurance." *American Academy of Political and Social Science. Annals*, March, 1917. V. 70. Pp. 297-316.

Discusses licensing of compensation insurers, reserve requirements and regulation of rates.

GREAT BRITAIN. HOME OFFICE. DEPARTMENTAL COMMITTEE ON WORKMEN'S COMPENSATION INSURANCE.

Minutes of evidence before committee appointed by the secretary of state for Home affairs, to inquire into the working of the present system of the payment of compensation to workmen for injuries sustained in the course of employment and to consider and report whether it would be desirable to establish a system of accident assurance under the control or supervision of the state. London, His Majesty's Stationery Off., 1920. 2 v.

HOOKSTADT, CARL. *Comparison of Workmen's Compensation Insurance and Administration*. Washington, U. S. Bureau of Labor Statistics, 1922. 194 p. Bulletin No. 301.

Report of an investigation made in response to "numerous requests from State legislators and others for information regarding the relative merits of different types of insurance under workmen's compensation." The report covers cost, security and service of various types of insurance carriers.

———. Three important problems of workmen's compensation. United States Bureau of Labor Statistics. *Monthly Labor Review*. October, 1917. Pp. 111-121.

Accident prevention; rehabilitation and reëducation of injured workers; "Free choice" in the selection of physicians. Discussion based upon papers and arguments presented at 4th annual meeting of I. A. I. A. B. C. 1917.

INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS. Proceedings. See numerous papers under the heading, "Administrative problems."

MINNESOTA. INTERIM COMMISSION OF THE SENATE.

Report on industrial accident compensation and state industrial insurance; (commission) appointed under resolution of the state senate of Minnesota, adopted April 21, 1919; together with three proposed bills. St. Paul, 1921. 63 p. (Senate document No. 1.)

RHODES, J. E. Compensation administration and adjustments.

American Academy of Political and Social Science. Annals, March, 1917, v. 70. Pp. 273-296.

Common law system and compensation systems compared; administration in different states described; relation of disease to compensation; payment of benefits.

RHODES, J. E. *Workmen's Compensation*. Ch. IX. New York, Macmillan, 1917.

SHIENTAG, BERNARD S. "Crime of Uninsurance under Workmen's Compensation." United States Bureau of Labor Statistics. *Monthly Labor Review*. September, 1920. Pp. 130-153.

The neglect of employers in New York state to carry compensation insurance as required by law and the resulting hardships to injured employees and their dependents. Some cases of uncollectible awards are cited.

SCHNITZLER, FERDINAND. "Determination of the consequences of industrial accidents in Austria. United States Bureau of labor statistics." *Monthly Labor Review*. December, 1916. Pp. 31-67.

Legal provisions as to mode and amount of compensation of injured persons; arbitration courts; basis for compensation of injured; decrease in earning capacity; compensation practice; systemic observation of the industrial activity of workmen in receipt of accident pensions; table of revision of compensation in 96 cases.

STODDARD, C. F. "Hernia as a factor in workmen's compensation awards." United States Bureau of Labor Statistics. *Monthly Labor Review*. November, 1918. Pp. 227-240.

Cites provisions of various United States laws and discusses them under: statutory provisions; rules governing awards for hernia; decisions by courts and commissions; relative importance of hernia in compensation awards; medical examination of applicants for work.

UNITED STATES. BUREAU OF LABOR STATISTICS. *Compensation for accidents to Employees of the United States*. Report of operations under the Act of May 30, 1908. Washington, Government Printing Office, 1914. 331 p. (Bulletin No. 155.)

For administration of individual laws, see reports of State industrial commissions.

See also, I I . General Treatises on Workmen's Compensation.

VII. COMPENSATION INSURANCE

ACCIDENT SEVERITY RATES. United States Bureau of labor statistics. *Monthly Labor Review*. November, 1917. Pp. 166-169.

A comparison of the scale used by the Bureau of Labor Statistics and the scale proposed by the International Association of Industrial Accident Boards and Commissions.

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE. *Annals*. March, 1917. V. 70. Philadelphia, The American Academy of Political and Social Science, 1917. Modern insurance problems.

Contents, Pt. 3.—The disability insurance policy, by A. P. Woodward, pp. 227-237; accident prevention by D. S. Beyer, pp. 238-243; methods of insuring workmen's compensation, by H. E. Ryan, pp. 244-254; the calculation of workmen's compensation premium rates, by C. E. Scattergood, pp. 255-262; the practice of schedule and experience rating for workmen's compensation risks, by Leon S. Senior, pp. 263-272; compensation administration and adjustments, by James E. Rhodes, pp. 273-296; the public supervision of workmen's compensation insurance, by E. H. Downey, pp. 297-316.

CASUALTY ACTUARIAL SOCIETY. *Proceedings*, V. I , 1914. New York, Casualty Actuarial Society.

Contains papers contributed by members of the Society. A number of these articles will be found in this list under the name of the author, in the sections to which they belong.

Name of the society changed May, 1921, from The Casualty Actuarial and Statistical Society of America.

DAWSON, MILES M. *Cost of Employers' Liability and Workmen's Compensation Insurance*. United States Bureau of Labor. Bulletin No. 90, 1910. Pp. 749-831.

Results of a study of United States and foreign employers' liability and workmen's compensation laws to ascertain the cost to the employer of insurance against industrial accidents. Tables show premium rates by industries for separate countries.

———. *Mortality and Remarriage Tables for Valuation of Compensation to Widows and Other Dependents*. Actuarial Society of America. Transactions, 1914, v. 15. Pt. 2. Pp. 306-314.

Includes the Dutch Remarriage Table.

———. *Temporary and Permanent Disability Reserves*. Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 40-53.

Explains the method of "setting up reserves prior to the determination of how the disabled workmen will emerge, *i. e.*, restored, permanently totally disabled, permanently partially disabled or dying in consequence of the accident," evolved by the State Insurance Fund of Holland. Tables are given.

———. *Workmen's Compensation Claim Reserves*. Casualty Actuarial Society. Proceedings, 1914-1915, v. I. Pp. 90-111.

Reserves to provide for the payment of sums to become due in future under awards already made; reserves to provide for the payment of sums to become due under claims already filed, for which no award has yet been made; reserves to provide for the payment of sums to become due under claims which may be filed because of accidents that have already occurred.

DOWNEY, E. H. *Classification of Industries for Workmen's Compensation Insurance*. Casualty Actuarial Society. Proceedings, 1915-1916. V. 2. Pp. 10-32.

A criticism of earlier and existing classifications and suggestions of a plan based upon "those fundamental and relatively standardized industry divisions which are commonly recognized as distinct departments of the individual establishment."

———. *Industrial Compensation Rating Schedule*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 325-346.

The provisions and application of the Schedule with special reference to Pennsylvania.

———. "Making of rates for workmen's compensation insurance." *Journal of Political Economy*. December, 1917. Pp. 961-983.

———. *Methods of Comparing Compensation Cost*. United States Bureau of Labor Statistics. Standardization of industrial accident statistics. Pp. 78-84. (Bulletin No. 276.)

———. "Organization of Workmen's Compensation Insurance." *Journal of Political Economy*. December, 1916. Pp. 951-984.

———. *Preliminary Test of the Coal Mine Rating Schedule of the Associated Companies*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 387-393-

The results of the plan as shown by the first inspection of coal mines in Pennsylvania.

———. *Remarriage Experience of Pennsylvania Compensation Insurance Carriers, Policy Years, 1916-1919*. Casualty Actuarial Society. Proceedings, 1921-1922. V. 8. Pp. 201-211.

———. *Some Principles of Compensation Merit Rating*. Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 26-42.

Advocates a schedule rating system which is subject to statistical control. Schedule rating discussed from the standpoint of the Massachusetts Schedule, the Pennsylvania Schedule and the Industrial Compensation Rating Schedule.

DOWNEY, E. H., and KELLY, G. C. *Revision of Pennsylvania Compensation Rates, 1918*. Casualty Actuarial Society. Proceedings, 1918-1919, v. 5. Pp. 243-273.

Detailed study of the method used.

FISHER, ARNE. *Note on an Application of Bayes' rule in the Classification of Hazards in Experience Rating*. Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 43-48.

———. *Note on the Application of Recent Mathematical-Statistical Methods to Coal Mine Accidents, with Special Reference to Catastrophes in Coal Mines in the United States*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 70-78.

. "An attempt to show how some recent researches on mathematical statistics, as carried on during the past five to ten years, especially through the investigations of the English biometricians and several Scandinavian statisticians, may be used in computing the various frequency ratios in connection with coal mine accidents."

———. *Note on the Construction of Mortality Tables by Means of Compound Frequency Curves*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 65-88.

———. *Note on the Frequency Curves of Basic Pure Premiums*. Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 241-254.

Illustrated by tables and charts.

———. *Outline of a Method for Determining Basic Pure Premiums*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 394-406.

FLYNN, BENEDICT D. *Method Proposed for the Calculation of Liability and Workmen's Compensation Claim Reserves*. Casualty Actuarial Society. Proceedings, 1914-1915, v. I. Pp. 131-140.

A study of two general plans for the calculation of claim reserves, viz.: an estimate of the probable cost of outstanding claims; a reserve of that part of the expected loss payments which has not been paid out up to date of valuation.

FONDILLER, RICHARD. *Office Practice in the Valuation of Compensation Losses*. Casualty Actuarial Society. Proceedings, 1915-16, v. 2. Pp. 427-446.

Presentation of the method in use in The New York State Insurance Fund in the valuation of claims.

GOODWIN, EDWARD S. *Study of Workmen's Compensation Schedule "W" and the Problems Incident Thereto.* Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 447-466.

Presents a proposed new form of report.

GREENE, WINFIELD W. *Should the Compensation Premium Reflect the Experience of the Individual Risk?* Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 347-355.

Discussion of experience rating under the headings: Objections to experience rating; the principle of deductible average plan feasible; retroactive experience rating of all large risks.

———. *Upon Combining Compensation Experience from Several States.* Casualty Actuarial Society. Proceedings, 1919-1920, v. 6. Pp. 10-30.

The reduction formula is explained and illustrated. Tables showing calculation of the reduction factor and test of pure premiums are included.

HANNA, HUGH S. *Memorandum on accident reports from Federal government shops.* United States Bureau of Labor Statistics. *Monthly Labor Review.* April, 1916. Pp. 73-76.

The large proportion of injuries terminating in third week in Government shops, does not establish the existence of the practice of malingering, but rather that the accident reports for short time disability are inadequate.

HANSEN, CARL M. *Development, Application, and Effect of Schedule Rating in Liability and Compensation Insurance.* Casualty Actuarial Society. Proceedings, 1914-1915, v. I. Pp. 217-226.

Describes the work of developing the Universal Analytic Schedule.

KELLY, GREGORY C. See DOWNEY, E. H., and KELLY, G. C.

LESLIE, WILLIAM. *Distribution of Surplus by Castudy Companies writing Participating Insurance.* Casualty Actuarial Society. Proceedings, 1920-1921, v. 7. Pp. 54-76.

An explanation of the dividend system used by the State Compensation Insurance Fund of California, with reference also to other existing dividend systems.

MAGOUN, WILLIAM N. *Essential Factors in the Computation of the Cost of Workmen's Compensation.* Casualty Actuarial Society. Proceedings, 1914-1915, v. I. Pp. 173-189.

Discussed under the following headings: Uniform tables for the establishment of compensation costs; uniform classification of industries; uniform classification of causes of injuries; uniform classification of nature of injuries.

MASSACHUSETTS. COMMISSION TO INVESTIGATE PRACTICES AND RATES IN INSURANCE. Report on Workmen's Compensation Insurance. Boston, Wright and Potter, 1915. 92 p.

1. Investigation of practices and rates of insurance companies to discover if monopoly or combination exists. 2. The reasonableness of rates. 3. Extent to which government regulation of rates is desirable.

MICHELbacher, G. F. *Distribution of "Shock" Losses in Workmen's Compensation and Liability Insurance*. Casualty Actuarial Society. Proceedings, 1920-1921, v. 7. Pp. 235-266.

An inquiry into the various methods employed by carriers underwriting workmen's compensation and liability insurance.

———. *Practice of Experience Rating*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 293-324.

Discussion is divided under such headings as: The form of experience rating; division of the rating procedure into several parts in rating individual risks; factors for the division of Manual rates into partial rates; what Manual rate should be employed as the basis of experience rating? combination of experience and schedule rating modifications; example of the application of the plan to the problem of rating an individual risk.

———. *Rating Permanent Disabilities in Combination*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 61-69.

Discussion of a method of rating "second injuries."

———. *Schedule Rating of Permanent Injuries*. Casualty Actuarial Society. Proceedings, 1914-1915, V. I. Pp. 257-274.

States the principal factors to be considered in rating permanent disability—the nature of the physical injury or disfigurement, the occupation, and the age—and discusses each one, illustrating them by means of tables.

———. *Technique of Rate Making as Illustrated by the 1920 National Revision of Workmen's Compensation Insurance Rates*. Casualty Actuarial Society. Proceedings, 1919-1920, v. 6. Pp. 201-249.

The discussion is divided as follows: The machinery; the problem; the data; preliminary work; establishment of basic pure premiums; determination of State pure premiums; projection of rates.

———. *Theory of Law Differentials*. Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 195-212.

Contents: The relationship of the law differential to the Basic Manual; differentiation between the use of the law differential as a reduction factor and as a projection factor; methods of

differential calculation; forms of law differentials; a system of law differentials by homogeneous groups of industries; a system of law differentials by rate groups.

MOWBRAY, ALBERT H. *Actuarial Problems of the 1920 National Revision of Workmen's Compensation Insurance Rates and the Solutions Developed by the Actuarial Committee of the National Council*. Casualty Actuarial Society. Proceedings, 1919-1920, v. 6. Pp. 250-284.

———. *Classification of Risks as the Basis of Insurance Rate Making with Special Reference to Workmen's Compensation Insurance*. Casualty Actuarial Society. Proceedings, 1920-1921, v. 7. Pp. 77-92.

A study, the purpose of which is to find some fundamental principle to which a correct system of classification in any branch of insurance should conform, and to apply it to workmen's compensation insurance.

———. *Determination of Pure Premiums for Minor Classifications on which the Experience data is Insufficient for Direct Estimate*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 124-133.

Discusses faults of existing methods and proposes a new method.

———. *How Extensive a Payroll Exposure is Necessary to Give a Dependable Pure Premium?* Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 24-30.

The author states that the answer to this question depends upon the answer to: (1) What are the characteristics of a dependable pure premium? (2) What factors tend to make a pure premium derived from experience independentable?

———. *New Criterion of Adequacy of Exposure*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 263-273.

———. *Schedule rating considered from an actuarial point of view*. Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 241-249.

Nature of problem; analysis to determine principles and relations; schedule rating; nature of factors to be considered; the intangible elements—moral hazard; practical schedule rating according to an engineer's schedule.

———. *Scheduled experience rating*. Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 14-25.

A method prepared by the writer is presented in this paper.

MOWBRAY, ALBERT H., BLACK, S. B., and BEYER, D. S. *On the Relation of Accident Frequency to Business Activity*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 418-426.

Report of studies of the cost of accidents made by the American Mutual Liability Insurance Company and the Massachusetts Employees Insurance Association.

NEW YORK STATE LEGISLATURE. JOINT COMMITTEE ON HOUSING. Intermediate report. Albany, J. B. Lyon, 1922. 257 p.

Part of this report, pp. 149-257, constitutes the report of the committee—sometimes called the "Lockwood committee"—on insurance. Workmen's compensation is covered in pp. 228-237.

OHIO. STATE INSURANCE FUND. Actuarial audit as of March 1, 1919, made by examiners E. H. Downey and Miles M. Dawson. Columbus, 1919. 66 p.

ORR, ROBERT K. *Liability and Workmen's Compensation Loss Reserves*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 134-137-

A plea for state regulation of reserves.

PERKINS, SANFORD B. *Suggested System of Standard Notation for Actuarial Work in Workmen's Compensation Insurance*. Casualty Actuarial Society. Proceedings, 1920-1921, v. 7. Pp. 36-56.

A system for the standardization of the notation employed in rate making, experience rating and the determination of loss reserves.

RUBINOW, ISAAC MAX. American methods of compensating permanent partial disabilities. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 235-252.

Criticism of the permanent partial disability provisions of the state laws.

———. *The Relation between Private and Social Insurance*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 335-346.

Presidential address before the 3d meeting of the Casualty Actuarial Society, May 26 and 27, 1916.

———. *Schedule Rating in Compensation Insurance*. Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 207-216

President's address—a general discussion of merit rating.

———. *Scientific Methods of Computing Compensation Rates*. Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 10-23.

Account of the difficulties encountered in the early years of compensation in the United States with an outline of the Standard Accident Table.

———. *Theory and Practice of Law Differentials*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 8-44.

After tracing the history of law differentials, the subject is reviewed under: The Standard Accident Table; methods of valuation; valuation of permanent partial disability cases; costs

of medical aid; effect of limits; selection of a proper basis; group differentials versus a general differential; problems of organization.

RYAN, HARWOOD E. *Method of Determining Pure Premiums for Workmen's Compensation Insurance*. Actuarial Society of America. Transactions, 1914, v. 15. Pt. 2. Pp. 364-371.

Discussion of the possibility of applying workmen's compensation experience in one or more states to the conditions of any other state.

———. "Methods of Insuring Workmen's Compensation." *American Academy of Political and Social Science Annals*, March, 1917, v. 70. Pp. 244-254.

Discusses stock and mutual companies, state funds, self-insurance and reciprocal or inter-insurance.

———. *Revision of Workmen's Compensation Rates* (January-March, 1917). Casualty Actuarial Society. Proceedings, 1916-1917, v. 3. Pp. 175-190.

Review of work of Augmented Standing Committee.

SCATTERGOOD, CLAUDE EDWARD. "Calculation of Workmen's Compensation Premium Rates." *American Academy of Political and Social Science Annals*, March, 1917, v. 70. Pp. 255-262.

Method of calculation of adequate rates.

SENIOR, LEON S. *Effect of Schedule and Experience Rating on Workmen's Compensation Risks in New York*. Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 227-240.

———. "Practice of Schedule and Experience Rating for Workmen's Compensation Risks." *American Academy of Political and Social Science Annals*, March, 1917, v. 70. Pp. 263-272.

STEWART, ETHELBERT. "Plea for more Adequate Accident Compensation Rates. United States Bureau of Labor Statistics." *Monthly Labor Review*. December, 1920. Pp. 1-10.

UNITED STATES BUREAU OF LABOR STATISTICS. "New Method of Computing Accident Rates." *Monthly Labor Review*. July, 1916. Pp. 6-17.

A system of assigning time losses for computation of accident severity rates, first worked out by the United States Bureau of Labor Statistics in 1914, and applied in the preparation of the group of charts exhibited at the Panama-Pacific International Exposition.

WHITNEY, ALBERT W. *Notes on the Theory of Schedule Rating*. Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 250-256.

———. *Study of Schedule Rating*. Casualty Actuarial Society. Proceedings, 1920-1921, v. 7. Pp. 225-234.

An outline of the work of revising the Industrial Compensation Rating Schedule now in progress by the National Council on Workmen's Compensation Insurance.

- . *Theory of Experience Rating*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 274-292.

An outline of the investigation into the theory of experience rating which resulted in the general plan adopted by the actuarial section of the National Reference Committee on Workmen's Compensation Insurance.

- WILLOUGHBY, WILLIAM FRANKLIN. *Accidents to Labor as Regulated by Law in the United States*. United States Department of Labor. Bulletin, January, 1901, No. 32. Pp. 1-28.

Summary of the regulations provided by statute in the United States, for the four classes of industry; railways, mines and quarries, factories and workshops, building and construction.

- WILSON, HERBERT M. *Inspection and Schedule Rating for Coal Mine Insurance*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 39-48.

Describes the method adopted by The Associated Companies.

- WOODWARD, JOSEPH H. *Experience Rating of Workmen's Compensation Risks*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 356-369.

Discussion of experience rating under the headings: Definitions; why experience rating is desired; the Massachusetts system; the New York system; the Ohio system; the Service Bureau system; the influence of the size of the risk on the rule for rating; partial self-insurance; application to large policies; fundamental tests; actual experiences vs. average accident values; payroll vs. premium as a measure of size; prospective and retrospective rating; competitive abuses.

- . *Premiums and Reserves of the Swiss Accident Insurance Institution*. Casualty Actuarial Society. Proceedings, 1917-1918, v. 4. Pp. 45-64.

Brief outline of the provisions of the Swiss law and a description of Swiss actuarial methods.

- . *Workmen's Compensation Reserves*. Casualty Actuarial Society. Proceedings, 1914-1915, v. 1. Pp. 112-130.

Discussion of the method of computing loss reserves.

See, also, I I . General Treatises on Workmen's Compensation.

VIII. GENERAL TREATISES ON DISEASES OF
OCCUPATION

COLLIS, E. L., and GREENWOOD, MAJOR. *Health of the Industrial Worker*; containing a chapter on Reclamation of the disabled, by A. J. Collis; with an introduction by Sir George Newman. London, Churchill, 1921, XIX. 450 p.

Bibliography at end of each chapter.

DUBLIN, LOUIS I. *Mortality Statistics of Insured Wage-Earners and Their Families*; Experience of the Metropolitan Life Insurance Company Industrial Department, 1911 to 1916, in the United States and Canada. New York, Metropolitan Life Insurance Company, 1919. VIII, 397 p.

GOLEBIEWSKI, ED. *Atlas and Epitome of Diseases Caused by Accidents*; authorized translation from the German, with editorial notes by Pearce Bailey. Philadelphia, Saunders, 1900. 549 p. (Saunders' Medical Hand-Atlases.)

A description of traumatic diseases designed for the use of medical practitioners, students and laymen connected with the business of accident insurance. Following a general study of accidents, the subject is treated under injuries and traumatic diseases of the various parts of the body, as, nerves, bones, head, spinal cord. The book is said to be the first to cover the whole subject of traumatism.

HAMILTON, ALICE. "Hygienic Control of the Aniline Dye Industry in Europe. United States Bureau of Labor Statistics." *Monthly Labor Review*. December, 1919. Pp. 1-21.

A study based on an investigation made by the author in plants in England, France, Switzerland and Germany. The poisonous effects of benzene compounds, anilin, dinitrophenol, dimethyl sulphate, phosgene, hydrogen arsenide, etc., are briefly discussed and methods for the prevention of industrial poisoning are outlined.

HAYHURST, E. R. *Industrial Health-Hazards and Occupational Diseases in Ohio*. Columbus, Ohio State Board of Health, 1915. 438 P.

Classification of industries and a study of the causes of hazard in each.

HOOKSTADT, CARL. "Cost of Occupational Disease under Workmen's Compensation Acts in the United States." United States Bureau of Labor Statistics. *Monthly Labor Review*. February, 1921. Pp. 154-159.

Study based on investigations and reports made by the Federal Government, California, Massachusetts and the National Council on Workmen's Compensation Insurance.

KOBER, G. M., and HANSON, W. C., ed. *Diseases of Occupation and Vocational Hygiene*. Philadelphia, Blakiston, C1916. 918 p.

Pt. I—Specific and systemic diseases of occupation, fatigue and neuroses, etc. Pt. II—Etiology and prophylaxis of occupational diseases. Vocational hygiene; Pt. III—The relation of clinics, statistics, governmental study and legislation to occupational diseases.

Written by specialists particularly for employers, employees, legislators, etc., with the object of aiding in correcting and preventing disease in industry. Bibliography at end of each chapter.

MACKEY, H. A., BLAKESLEE, W. H., and PRICE, I. M. *Medico-Legal Aspects of the Workmen's Compensation Law of Pennsylvania*. Harrisburg, Workmen's Compensation Bureau, 1918. 55 p.

Explains how claims for compensation for disease are treated by the Workmen's Compensation Board of Pennsylvania.

MADDRILL, JAMES D. *Compensation Cost of Occupational Disease*. Casualty Actuarial Society. Proceedings, 1915-1916, v. 2. Pp. 208-227.

Reviews the provisions of the various state compensation laws and cites experience of the United Kingdom, 1908-1914. A comprehensive bibliography is appended.

MOCK, HARRY E. *Industrial Medicine and Surgery*. Philadelphia, Saunders, 1921, C1919. 846 p.

Based on practical experience of the writer. Pt. I. Industrial health service; Pt. II. Prevention; Pt. III. Industrial medicine; Pt. IV. Industrial surgery; Pt. V. Compensation. Insurance. Medico-legal phases; Pt. VI. Reconstruction. Bibliography, pp. 801-824.

NATIONAL CONFERENCE ON INDUSTRIAL DISEASES. Chicago, June 10, 1910. New York, American Association for Labor Legislation, 1910.

Papers: Phosphorus poisoning in the manufacture of matches, by John B. Andrews; occupational diseases in Illinois, by Charles R. Henderson; lead poisoning in Illinois, by Alice Hamilton; problems and extent of industrial diseases, by Frederick L. Hoffman.

NEW YORK STATE INDUSTRIAL SAFETY CONGRESS. Proceedings, 1916. Albany, State Industrial Commission, 1917.

Papers presented at annual meetings.

OLIVER, THOMAS, ed. *Dangerous Trades*; The historical, social, and legal aspects of industrial occupations as affecting health, by a number of experts. London, Murray, 1902. 891 p.

———. *Diseases of Occupation from the Legislative, Social, and Medical Points of View*. London, Methuen, 1908. XIX, 427 p.

Describes industrial processes and the diseases which are common to them, together with methods of treatment.

PARRY, LEONARD A. "Risks and Dangers of Various Occupations and their Prevention. London, Scott, Greenwood, 1900. 196 p.

Contents: Occupations which are accompanied by the generation and scattering of abnormal quantities of dust; trades in which there is danger of metallic poisoning; certain chemical trades; trades in which various poisonous vapours are inhaled; general hygienic considerations.

PRUDENTIAL INSURANCE COMPANY OF AMERICA. STATISTICIAN'S DEPARTMENT. Scientific publications. Newark, New Jersey.

RAMBOUSEK, JOSEF. *Industrial Poisoning from Fumes, Gases, and Poisons of Manufacturing Processes*. Tr. and ed. by Thomas M. Legge, London, Arnold, 1913. 360 p.

Pt. I. Description of the industries and processes attended with risk of poisoning, incidence of such poisoning; pathology and treatment of industrial poisoning; preventive measures against industrial poisoning. Appendix is a list of references to work of foreign writers, which were contained in the original work, arranged by the translator for greater convenience.

SOMMERFELD, T., and FISCHER, R. List of industrial poisons and other substances injurious to health found in industrial processes. Tr. by Dr. Wm. H. Rand. Columbus, Ohio, State Board of Health, 1914. 33 p.

Includes, "The commoner poisons and those most universally used in the various branches of industry." The list is arranged alphabetically in tabular form under, "Designation of the substance," "Branches of industry in which poisoning occurs," "Mode of entrance into the body," "Symptoms of poisoning."

May be found also in Kober and Hanson. *Diseases of Occupational and Vocational Hygiene*. Pp. 720-748, and in U. S. Bureau of Labor. Bulletins No. 86, and No. 100.

THOMPSON, WILLIAM GILMAN. Occupational diseases; their causation, symptoms, treatment and prevention. New York, Appleton, 1914. 724 p.

Detailed study divided under, history, classification, general pathology and etiology; general remedial measures; diseases due to irritant substances; diseases due to harmful environment;

special occupational diseases; influence of special conditions on the occupational diseases; miscellaneous occupational diseases grouped by industries not included in the foregoing classification. The appendix contains a list of the principal harmful substances and their effects, a list of the principal industries in which dust constitutes the essential hazard, a list of important industries in which the workman is subject to several hazards.

TOLMAN, W. H., and KENDALL, L. B. *Safety; Methods for Preventing Occupational and Other Accidents and Disease*. See X I. Accident Prevention.

UNITED STATES. BUREAU OF LABOR STATISTICS. *Bulletins. Industrial Accidents and Hygiene Series*.

The bulletins in this series are: 104, August, 1912, Lead Poisoning in Potteries, Tile Works, and Porcelain Enameled Sanitary Ware Factories, by Alice Hamilton; 120, May, 1913, Hygiene of the Painters' Trade, by Alice Hamilton; 127, August, 1913, Dangers to Workers from Dusts and Fumes and Methods of Protection, by W. C. Hanson; 141, February, 1914, Lead Poisoning in the Smelting and Refining of Lead, by Alice Hamilton; 157, March, 1915, Industrial Accident Statistics, by F. L. Hoffman; 165, December, 1914, Lead Poisoning in the Manufacture of Storage Batteries, by Alice Hamilton; 179, October, 1915, Industrial Poisons in the Rubber Industry, by Alice Hamilton; 188, March, 1916, Report of British Departmental Committee on the Danger in the Use of Lead in the Painting of Buildings; 201, August, 1916, Report of the Committee on Statistics and Insurance Cost of the International Association of Industrial Accident Boards and Commissions; 205, January, 1917, Anthrax as an Occupational Disease by J. B. Andrews; 207, March, 1917, Causes of Death by Occupation, by L. I. Dublin; 209, April, 1917, Hygiene of the Printing Trades, by Alice Hamilton and C. H. Verrill; 216, August, 1917, Accidents and Accident Prevention in Machine Building, by L. W. Chaney; 219, May, 1917, Industrial Poisons Used or Produced in the Manufacture of Explosives, by Alice Hamilton; 221, April, 1917, Hours, Fatigue and Health in British Munition Factories; 230, July, 1917, Industrial Efficiency and Fatigue in British Munition Factories; 231, June, 1918, Mortality from Respiratory Diseases in Dusty Trades, by F. L. Hoffman; 234, June, 1918, Safety Movement in the Iron and Steel Industry, 1907 to 1917, by L. W. Chaney and H. S. Hanna; 236, July, 1918, Effect of the Air Hammer on the Hands of Stone Cutters; 249, Industrial Health and Efficiency, Final Report of the British Health of Munition Workers Com-

mittee; 251, October, 1919, Preventable Deaths in the Cotton Manufacturing Industry, by A. R. Perry; 253, February, 1919, Women in the Lead Industry, by Alice Hamilton; 256, November, 1919, Accidents and Accident Prevention in Machine Building, by L. W. Chaney; 267, July, 1920, Anthrax as an Occupational Disease, by J. B. Andrews, Rev. ed.; 276, September, 1920, Standardization of Industrial Accident Statistics; 291, December, 1921, Carbon Monoxide Poisoning, by Alice Hamilton; 293, May, 1922, Problem of Dust Phthisis in the Granite-Stone Industry, by F. L. Hoffman; 306, April, 1922, Occupation Hazards and Diagnostic Signs, a Guide to Impairments to be Looked for in Hazardous Occupations, Louis I. Dublin and Philip Leiboff.

Previous to the publication of this series a number of reports were issued devoted wholly or in part to "Industrial accidents and hygiene." For a list of these consult Bulletin 174, "Subject index of the publications of the Bureau of Labor Statistics, up to May 1, 1915.

UNITED STATES. BUREAU OF LABOR STATISTICS. *Monthly Labor Review*. Washington, July, 1915.

The section in each number, entitled "Industrial Accidents and Hygiene" contains articles and reviews of publications on occupational diseases.

UNITED STATES. PUBLIC HEALTH SERVICE. HYGIENIC LABORATORY. *Bulletins*. Washington.

PERIODICALS—

The Nation's Health (up to May, 1921, Modern Medicine). Chicago, Modern Hospital Publishing Company.

Journal of the American Medical Association. Chicago, American Medical Association.

Journal of Industrial Hygiene. New York, Macmillan.

IX. STATISTICS OF INDUSTRIAL INJURIES IN THE UNITED STATES

DOWNEY, E. H. "Essentials of Workmen's Compensation Statistics." *Journal of Political Economy*. December, 1914. Pp. 955-968.

———. *Uses and Abuses of Schedule Z*. New York, National Council on Workmen's Compensation Insurance, 1920. 12 p.

HARDISON, FRANK H. *Origin and History of Schedule Z in Massachusetts*. New York, National Council on Workmen's Compensation Insurance, 1920. 10 p.

HOOKSTADT, CARL. "Discussion of an American Accident Table." United States Bureau of Labor Statistics. *Monthly Labor Review*. July, 1915. Pp. 1-5.

INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS. Standardization of industrial accident statistics. Reports of the committee on statistics and compensation insurance cost, 1915-1919. Washington, U. S. Bureau of Labor Statistics, 1920. (Bulletin No. 276.)

The definitions, recommendations, and information contained in the annual reports of the committee, revised to date and combined.

OUTWATER, OLIVE E. *American Accident Table*. Casualty Actuarial Society. Proceedings, 1920-1921, v. 7. Pp. 57-77.

An outline of the origin of the table and a description of its compilation. Illustrated by charts and tables.

PENNSYLVANIA COMPENSATION RATING AND INSPECTION BUREAU—COAL MINE SECTION AND THE INSURANCE DEPARTMENT OF PENNSYLVANIA. Statistical analysis of coal mine accidents. Harrisburg, Pa. Comp. Rat'g and Insp. Bur.—Coal mine section.

Coal mine insurance experience, 1916-1920.

PENNSYLVANIA INSURANCE DEPARTMENT AND PENNSYLVANIA COMPENSATION RATING AND INSPECTION BUREAU—STATISTICAL DEPARTMENT. Statistical analysis of workmen's compensation insurance in Pennsylvania from January 1, 1916, to December 31, 1918, 1916-1919, 1916-1920. Philadelphia, Pa. Comp. Rat'g Insp. Bur., 1919-1921.

1916-1920 compiled and published by Pennsylvania compensation Rating and Inspection Bureau—Statistical Department.

PENNSYLVANIA WORKMEN'S COMPENSATION BUREAU. Accident reports received, agreements approved, compensation awarded and paid, permanent injuries. November, 1920. (Monthly reports.) Harrisburg, Workmen's Comp. Bur. Photostat—1 sheet.

PORTLAND CEMENT ASSOCIATION. Accident Prevention Bulletin. Chicago. Published bi-monthly.

Statistics of accidents in the industry are published annually in this bulletin.

RUBINOW, ISAAC MAX. *Standard Accident Table as a Basis for Compensation Rates*. Distribution of 100,000 accidents. New York, Spectator Co., C1915.

"Designed as a basis for calculation of the differences in cost of compensation between different state laws."

UNITED STATES. BUREAU OF LABOR STATISTICS. *Monthly Labor Review*.

Contains, from time to time, articles showing accident statistics for various industries. See particularly articles by L. W. Chaney on accidents in the iron and steel industry.

———. Bulletin No. 339, 1923. Statistics of Industrial Accidents in the United States, by Lucian W. Chaney.

UNITED STATES. BUREAU OF MINES. Accidents at metallurgical works in the United States—1913-1914. Washington, Gov't Print. Off., 1915. (Technical papers series.)

———. Coal mine fatalities in the United States, 1870-1914, with statistics of coal production, labor and mining methods by states and calendar years. Comp. by Albert H. Fay. Washington, Gov't Print. Off., 1916. (Bulletin No. 115.)

Later years published in annual bulletins. The Bureau of mines also publishes a "Monthly statement of coal mine fatalities," issued every month but December.

———. Coke-oven accidents in the United States—1913-1914. Washington, Gov't Print. Off., 1915. (Technical papers series.)

———. Metal-mine accidents in the United States—1911. Washington, Gov't Print. Off., 1913. (Technical papers series.)

———. Quarry accidents in the United States during the calendar year 1911. Washington, Gov't Print. Off., 1913.

VERRILL, CHARLES H. Industrial Accident and Compensation Statistics. *American Economic Review*. Supplement. March, 1922. Pp. 137-152.

In this paper will be found a summary of the work of the committee on statistics and compensation costs of the International Association of Industrial Accident Boards and Commissions.

WISCONSIN. INDUSTRIAL COMMISSION. General accident statistics. *Wisconsin Safety Review*. August-September-October number, 1921.

Summary for 1915-1920 and detailed statistics for 1920,

The following reports include statistics of accidents in more or less detail:

CALIFORNIA. INDUSTRIAL ACCIDENT COMMISSION. Report. 1911. San Francisco.

ILLINOIS. BUREAU OF LABOR STATISTICS. Report, Industrial accidents in Illinois, 1907. Springfield.

ILLINOIS. INDUSTRIAL COMMISSION. Report, July 1, 1915. Chicago. Includes Statistical Report for calendar year.

INDIANA. INDUSTRIAL BOARD. Report. Indianapolis.

- KENTUCKY. WORKMEN'S COMPENSATION BOARD. Report. July 1, 1916. Frankfort.
- MARYLAND. INDUSTRIAL ACCIDENT COMMISSION. Report. November 1, 1914. Baltimore.
- MASSACHUSETTS. INDUSTRIAL ACCIDENT BOARD. Report. July 1, 1912. Boston.
- MICHIGAN. INDUSTRIAL ACCIDENT BOARD. Statistical Report. 1913. Lansing.
- MINNESOTA. DEPARTMENT OF LABOR AND INDUSTRY. Report. 1889. Minneapolis.
- MONTANA. INDUSTRIAL ACCIDENT BOARD. Report. July 1, 1915. Helena.
- NEVADA. INDUSTRIAL COMMISSION. Report. July 1, 1912. Carson City.
- NORTH DAKOTA. WORKMEN'S COMPENSATION BUREAU. Report. July 1, 1919. Bismarck.
- OKLAHOMA. INDUSTRIAL COMMISSION. Report. September 1, 1916. Oklahoma City.
- OREGON. INDUSTRIAL ACCIDENT COMMISSION. Report. July 1, 1914. Salem.
- UNITED STATES. EMPLOYERS' COMPENSATION COMMISSION. Report. September 7, 1916. Washington.
- UTAH. INDUSTRIAL COMMISSION. Supplemental Report. July 1, 1917. Salt Lake City.
- VERMONT. COMMISSION OF INDUSTRY. Report. Montpelier.
- VIRGINIA. INDUSTRIAL COMMISSION. Report. October 1, 1918. Richmond.
- WASHINGTON. INDUSTRIAL INSURANCE AND MEDICAL AID DEPARTMENTS. Report. October 1, 1911. Olympia.
1918 and 1919 reports published by Industrial Insurance and Medical Aid Departments.
- WISCONSIN. INDUSTRIAL COMMISSION. Industrial Accidents, July 1, 1912, to December 31, 1914.
Statistics for 1915-1919 were published as follows:
Industrial Accidents in Wisconsin, 1915-16-17 (blue print).
Compensable Industrial Accidents in Wisconsin for the year 1918 (blue print).
Compensable Industrial Accidents in Wisconsin for the year 1919 (blueprint).
These were followed by, "General Accident Statistics," noted above.
- WYOMING. WORKMEN'S COMPENSATION DEPARTMENT. Report. 1916. Cheyenne.

X. INDUSTRIAL INJURIES AS A SOCIAL PROBLEM

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE. *Annals*, May, 1906, v. 27. Philadelphia, The American Academy of Political and Social Science, 1911. Improvements of labor conditions in the United States. Pt. I. Length of the Working or Trade Life.

Contents: Physical and medical aspects of labor and industry, by Frederick L. Hoffman, manhood tribute to the modern machine, by James O'Connell; length of the trade life in the glass bottle industry, by Denis A. Hayes; plea for the investigation of the conditions affecting the length of trade life, by Robert Hunter.

CONYNGTON, MARY K. "Effect of workmen's compensation laws in diminishing the necessity of industrial employment of women and children, Washington, United States Bureau of Labor Statistics, 1917. 170 p. (Bulletin No. 217.)

A study undertaken for the purpose of comparing workmen's compensation laws with employers' liability laws. Conditions were studied in Connecticut and Ohio for workmen's compensation, and in Pennsylvania (prior to January 1, 1916, when the compensation act became effective), for employers' liability.

EASTMAN, CRYSTAL. *Work-Accidents and the Law*. Pt. 2. New York, Survey Associates, 1910. (Russell Sage Foundation—Pittsburgh Survey.)

GEPHART, WILLIAM FRANKLIN, *Insurance and the State*. Chs. VI, VII. New York, Macmillan, 1913.

ILLINOIS. EMPLOYERS' LIABILITY COMMISSION. Report, 1910.

INTERNATIONAL ASSOCIATION OF INDUSTRIAL ACCIDENT BOARDS AND COMMISSIONS. Proceedings. See II. General Treatises on Workmen's Compensation.

KING, W. L. MACKENZIE. "Industry and humanity; a study in the principles underlying industrial reconstruction. Ch. IX. Boston, Houghton, 1918. 567 p.

MICHIGAN. EMPLOYERS' LIABILITY AND WORKMEN'S COMPENSATION COMMISSION. Report. Lansing, State printers, 1911. 152 p.

NEW YORK STATE. COMMISSION ON EMPLOYERS' LIABILITY. Report. 1910-1911. See IV. Development of the American Compensation System.

OHIO. EMPLOYERS' LIABILITY COMMISSION. Report to the legislature of the state of Ohio, by the commission appointed—under the laws of 1910: an act to provide for the appointment of a com-

mission to inquire into the question of employers' liability—Columbus, State printer, 1911. 3 parts.

Pt. 1. Report. Pt. 2. Minutes of Evidence and Record of Public Hearings. Pt. 3. Final Report.

RUBINOW, ISAAC MAX. *Social Insurance*. Pt. II. New York, Holt, 1916. See I. General Treatises on Social Insurance.

WOODBURY, ROBERT MORSE. *Social Insurance*. Ch. IV. New York, Holt, 1917. See I. General Treatises on Social Insurance. See, also, I. General Treatises on Social Insurance; II. General Treatises on Workmen's Compensation; XI. Accident Prevention.

XI. ACCIDENT PREVENTION

ALEXANDER, MAGNUS W. *Safety in the Foundry*. Chicago, National Founders' Association, 1915. 187 P.

The results of investigations carried on during two years, by the Committee on Safety and Sanitation of the National Founders' Association. The book "reflects the experience and expert judgment of many practical foundrymen and foundry executives throughout the country."

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE. *Annals*, July, 1911, v. 38. Philadelphia, The American Academy of Political and Social Science, 1911. Risks in modern industry. Pt. 2. Industrial Accidents and Their Prevention.

Contents: Prevention of industrial accidents, by Charles Nagel, pp. 71-73; inadequacy of present laws concerning accidents, by John Hays Hammond, pp. 74-75; burden of industrial accidents, by John Mitchell, pp. 76-82; injustice of the present system, by James Bronson Reynolds, pp. 83-85; necessity for social insurance, by John Graham Brooks, pp. 86-89; Red Cross measures for the prevention of disasters, by Mabel T. Boardman, pp. 90-93; our lack of statistics, by Florence Kelly, pp. 94-97; the three essentials for accident prevention, by Crystal Eastman, pp. 98-107; the necessity for safety devices, by J. C. Delaney, pp. 108-111; government measures to increase mine safety, by J. A. Holmes, pp. 112-114.

ASHE, SYDNEY WHITMORE. *Organization in Accident Prevention*. 1st ed. New York, McGraw-Hill, 1917. 130 p.

Based on actual experience of the author, in organizing safety work.

BARNES, CHARLES BRINTON. *Longshoremen*. New York, Survey Associates, 1915. 287 p. (Russell-Sage Foundation—Publications), Chapter IX. Pp. 129-167, Risks of the trade; Appendix

H, pp. 239-244, Accident prevention regulations for the stevedoring industry, extracts from Warehousing accident insurance associations of Great Britain; Appendix I, pp. 245-248, Regulations for the prevention of accidents, Hamburg, Germany, extracts from Harbor inspection department of Hamburg.

Report based on an investigation made by the author in 1910 and 1911.

BEYER, DAVID STEWART. *Industrial Accident Prevention*. Boston, Houghton, 1916. 421 p.

Types of safety appliances are shown by many photographs of devices which have been actually tried and proven effective.

———. "Accident Prevention." *American Academy of Political and Social Science, Annals*, March, 1917, v. 70. Pp. 238-243.

The historical development, value and possibilities of accident prevention.

CALDER, JOHN. *Prevention of factory accidents; being an account of manufacturing industry and accident and a practical guide to the law on the safe-guarding, safe-working and safe-construction of factory machinery, plant and premises*. London, Longmans, 1899- 325 P.

CAMPBELL, GILBERT LEWIS. *Industrial Accidents and Their Compensation*. Boston, Houghton, 1911. 105 p. (Hart, Schaffner and Marx prize essays.)

The subject is discussed under the chapter headings: Statistics of industrial accidents; the social cost of industrial accidents; voluntary agencies compensating industrial accidents; employers' liability in the United States; employers' liability insurance; conclusion and suggested reforms. Illustrated by statistical tables from many sources.

CHANEY, LUCIAN W. *Accidents and Accident Prevention in Machine Building*. Washington, U. S. Bureau of Labor Statistics, 1920. 123 p. (Bulletin No. 256. Rev. ed. of No. 216.)

A report covering an investigation of 194 selected plants in the machine building industry. "The report seeks, as far as possible, to locate the accident hazards in particular departments and occupations, to discover the reason and causes for the occurrence of accidents, and to point out some of the more successful methods for their prevention."

CHANEY, LUCIAN W., and HANNA, HUGH S. *Safety Movement in the Iron and Steel Industry, 1907 to 1917*. Washington, Gov't Print. Off., 1918. 299 p. (U. S. Bureau of Labor Statistics, Bulletin No. 234.)

The discussion is divided under the headings: A review of the

safety movement, with special reference to the war, and Causes and prevention of accidents. Illustrations and charts are included.

COWEE, GEORGE ALVIN. *Practical Safety Methods and Devices; Manufacturing and Engineering*. New York, Van Nostrand, 1916.

"Intended to provide for employers, superintendents, foremen, underwriters, safety inspectors and engineers generally, a convenient summary of standard safety methods and devices as developed and perfected by those who have specialized in this subject."

Author's preface.

EASTMAN, CRYSTAL. *Work-Accidents and the Law*. New York, Survey Associates, 1910. 335 p. (Russell-Sage Foundation—Pittsburgh Survey.)

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