

ABSTRACT OF THE DISCUSSION OF THE PAPERS READ AT
THE PREVIOUS MEETING.

DISABILITY BENEFITS IN LIFE INSURANCE POLICIES—

J. H. WOODWARD.

VOL. VII, PAGE 10.

WRITTEN DISCUSSION.

MR. A. H. MOWBRAY :

A descriptive and historical paper of the type of this one does not generally lend itself to formal discussion except to point out errors and omissions, if any, and Mr. Woodward does not write that type of paper. It is, therefore, not my intention to discuss the paper generally, but to call attention to an item that is to me of considerable historical interest.

Mr. Woodward points out the peculiar, almost "back-door" way in which this benefit has come into American life insurance, remarking that on reflection the strange thing is not that the benefit has had the development it has, but that its desirability was not sooner recognized. In Mr. Hunter's study, "Total Disability Benefits in Relation to Life Insurance," recently issued by the Actuarial Society of America, he says that the first policies containing this form of insurance appear to have been granted in Germany in 1876 and by American fraternal orders in the succeeding year, but that it was not until 1896 that any regular life insurance company adopted the benefit, and that it did not come into general use until 1907 and thereafter. A short while ago, in connection with some studies of sickness tables, I found in the *Journal of the Institute of Actuaries*, Volume VIII, page 112 and following, a letter from Mr. John A. Higham, dated Royal Exchange Assurance, May 30, 1857, and addressed to the editor of the *Journal*, then the *Assurance Magazine*, relative to Mr. A. G. Finlaison's sickness tables which had then just come out, in the course of which (page 115) appears this significant paragraph:

"The materials which Mr. Finlaison possesses for ascertaining the probability of chronic sickness must be highly valuable: perhaps it is not too much to hope that he may be induced to collate and publish them separately. Insurance companies will confer another boon on men who, in common with their families, depend on

their professional exertions, when, on sufficient data, they can afford the means of providing against permanent sickness—the only ill, legitimately within their province, against which they do not afford protection. The man who has insured his life, or contracted for an endowment or an annuity yet deferred, and who is disqualified by sickness from continuing his premiums and even from maintaining himself, is in sad case, and to this case we can at present apply no remedy.”

When we reflect that almost precisely half a century before American life insurance reluctantly adopted the benefit merely as a talking point in selling insurance one of the most eminent British actuaries of his day had realized the high social value of this benefit, its late introduction and development seem even stranger.

MR. B. D. FLYNN:

Mr. Woodward states that his paper was designed to give students an idea of the history and development of the disability benefit in life insurance policies, together with a general view of the many actuarial and underwriting problems met in studying this insurance feature. It is sufficient to say that he has accomplished his purpose in his usual clear and thorough manner. There seems to be no phase of the subject which has not been touched upon, and but little which can be added by way of discussion.

Mr. Woodward expresses the hope that some safe way may be found to insure in a permanent disability benefit “against total incapacity to perform the duties of an insured’s regular vocation as distinguished from total disability to perform any kind of work whatsoever for remuneration or profit.” I question if the disability benefit can be improved in a satisfactory and practical way along the line which Mr. Woodward has indicated. In the opinion of most accident underwriters, it is safe and practical to provide a benefit for incapacity to perform the duties of an insured’s regular occupation during a limited period after commencement of disability, let us say twelve months; but after the expiration of that period, when the disability ordinarily can be called permanent, the indemnity must be confined to the period during which the insured is disabled from performing the duties of any gainful occupation. If we consider an example, I believe we will concede the value of their opinion. A dentist may receive an accidental injury to his right hand and during a limited period he is disabled from performing the duties of his regular occupation. In all probability during the greater part of this period he would be disabled from performing the duties of any gainful occupation, at least there would be small prospect of his entering another occupation by which he could earn a living. If at the end of one year, however, the dentist be still disabled and likely to remain so—possibly a permanent disability—there would be a strong probability that he would enter some other

occupation. He might become a salesman and earn even more money in that occupation than he did as a dentist. In such an event, it would not be proper nor wise to have a benefit in the insurance contract which would provide full indemnity for his inability to continue as a dentist, in view of the fact that he was able to earn as much, or possibly more, in the new occupation. Other cases somewhat similar might be cited—as, for example, a lecturer or actor whose vocal cords were impaired and who might later take up some other occupation, but suffer no material impairment of income. The general conclusion seems to be a wise one, therefore, that when a disability can be considered of a permanent nature, the simple test as to whether or not the insured can continue in his regular occupation is not sufficient as a basis for continuation of total indemnity payment.

There seems to be a place in a disability benefit, however, for a provision for partial indemnity for partial loss of earning capacity. By partial loss of earning capacity I do not mean what is generally termed partial disability. It is now generally agreed among underwriters, I believe, that the attempt to give partial indemnity during a temporary period of partial disability from sickness has proved a failure. It is possible for a person to be disabled by accidental injury from performing one or more important duties pertaining to his occupation, but to determine partial disability from sickness, particularly in the preferred occupations, is most difficult, and contracts providing this benefit have caused considerable waste of claim money in questionable claims. If the injury or disease causes a permanent loss of part of earning capacity, however, regardless of whether the insured was obliged to change his occupation, it would seem most desirable to provide a benefit under the disability clause if a safe and practical method of administering it can be obtained.

In workmen's compensation insurance there is such a benefit, but ordinarily there is some court of appeal or claim determining commission which settles definitely and finally the difficult problems of ascertaining the degree of loss of earning capacity. Further, the referee can settle the case upon the basis of the claimant's *ability* to earn if he is loathe to take up a new occupation. There would seem to be small likelihood, however, in the absence of a referee, of the satisfactory adjustment of claims which depended for their settlement upon the determination of such a difficult point as the degree of loss of earning capacity by the claimant. Although such a benefit would undoubtedly be beneficial, it is the opinion of the writer that in view of the many difficulties involved, it will be some time before a company will undertake to provide such a benefit under its disability clause.

There has been a marked tendency of late among life insurance companies to cut down the "probationary period"—*i.e.*, the time which must elapse after the occurrence of disability before the bene-

fit begins. As Mr. Woodward states, in the early years of underwriting of this benefit—particularly the annuity benefit—many companies required that six months must elapse from the date of receipt of satisfactory proof before first annuity payment be made. At the present time more and more companies are making the first payment under the benefit immediately upon receipt of satisfactory proof, or on the first of the month following receipt of such proof. It has been found from experience that a certain period will elapse—about three months on the average—between the beginning of permanent total disability and the submission of proof by the insured. In all but a small percentage of cases the condition of the insured has developed to the point where the question of total and permanent disability can be safely admitted when the claim papers are submitted. There remains, therefore, only a comparatively small number which require some postponement of the final approval of the claim papers. The companies have learned, therefore, that as a practical matter there is no necessity for the waiting period following the receipt of satisfactory proof before the first payment of annuity benefit.

Another safeguard placed about the permanent total disability benefit by the companies in the early years—namely, that at least one annual premium be paid before the disability clause be operated—has been found by experience to be unnecessary and has been removed by most companies.

Mr. Woodward refers to a recent action by one company to begin the payment of the benefit as soon as satisfactory proof of total and permanent disability is obtained, or at the end of three months of total disability, whether or not it is adjudged permanent at the end of that time. One other company has fixed the period at six months instead of three months. Although this is a laudable liberalization of the total and permanent disability benefit in life insurance policies, such action should be followed by other companies only after a full appreciation of the many new problems which are opened up by the entrance of the life insurance company into this field—which is practically that of non-cancellable accident and sickness insurance, with a three or six months' elimination period. The effect of the incontestability clause of the life contract in handling improper claims, the increase in the number of claims and expenses of handling them, and the consideration of the necessary safeguards which are thrown about accident and sickness contracts are some of the points to be considered. The discussion of this new and important development of the disability benefit in life insurance policies is such a broad one, however, that clearly this is not the time to take it up.

AUTHOR'S REVIEW OF DISCUSSIONS.

MR. J. H. WOODWARD:

As both Messrs. Flynn and Mowbray have intimated in the discussions which they have taken the trouble to prepare, the paper under consideration offers but slight incentive to remark. It was intended simply as a students' paper and contains little that is controversial.

In closing the discussion, however, I should like to refer briefly to some of the points raised by Mr. Flynn in his interesting and well-considered comments.

With reference to the possibility of extending the definition of what constitutes total disability, it is evident that I did not succeed in clearly expressing the thought which I had in mind. I quite concur with Mr. Flynn that it would be most undesirable to extend the benefit in any way which would fail to take account of the rehabilitation of the disabled individual or which would tend to discourage efforts on his part to find a new occupation in which his impairment would not be a serious handicap. It seems highly desirable, however, that the language of the contract should more nearly indicate what will be considered by the company to constitute a disability which is total. The three months' clause referred to has done much to remove doubt from the minds of laymen as to what disability will be construed to be *permanent*. It now remains to effect a similar clearing up of the atmosphere as to what disability will be construed to be *total*. It seems to me, and in this Mr. Flynn apparently concurs, that this should rest fundamentally on the loss of earning power, and there seems no practical basis for measuring such loss except in terms of money. Mr. Flynn points out that the situation in respect to the disability clause differs from that in compensation insurance in that there is no administrative or quasi-judicial body to determine the degree of invalidity. It seems quite true that in connection with a disability clause any exact determination of the degree of invalidity is out of the question.

It does not follow, however, that it would be impracticable to insert a provision in the contract specifying, for example, that where the impairment is such that the insured is able to earn less than a certain percentage—say 25 percent—of the amount which he earned prior to his injury or sickness, then such disability shall be construed to be total. It is not the intention of the contract that a high-grade business or professional man who becomes permanently disabled should be cut off from the benefit simply because it might be shown that he could acceptably perform the duties of such an occupation as, for example, a watchman or a park attendant. This fact, however, is not generally understood and might well be made clear in the contract. As a matter of fact, the companies do in

actual practice settle claims on a basis considerably more liberal than the terms of the policy suggest, and many disabilities are admitted to be total where liability might be denied under a technical construction. There would seem to be no sufficient reason why this liberality of treatment should not be availed of by the companies to make the terms of the contract itself more attractive.

The enumeration in the contract of certain specific dismemberments which will be in all cases construed to constitute permanent total disability has the drawback that it creates the impression in many minds that these disabilities are practically the only disabilities covered by the clause. This is objectionable from the sales point of view, as we know that as a matter of fact such dismemberments make up but a very small percentage of the total number of claims admitted. Again, certain theoretical inconsistencies arise which are well illustrated by the case of the dentist which Mr. Flynn takes to illustrate his remarks. The dentist has presumably spent many years and a considerable amount of money in preparation for his profession and has, let us assume, succeeded in building up a profitable practice. A permanently disabling injury to his right hand requires him to sacrifice all or most of the results of his professional training and experience, although, as Mr. Flynn points out, he may ultimately succeed in rehabilitating himself economically—but for such an injury he is not entitled to present a claim under his disability clause. If, however, he should be so unfortunate as to lose both feet, he might in many cases continue in his practice as a dentist, but he would nevertheless be entitled to full benefit under the policy terms.

It would seem to be a sound general principle that the loss of ability to earn more than a relatively insignificant proportion of the income previously received on account of personal services should be made in express terms the basis for a carefully guarded definition of what disability is to be construed as total. I gather from Mr. Flynn's remarks that he would probably concur in this general principle, and therefore it may be that we are not, after all, so far apart. I unqualifiedly agree with Mr. Flynn in his general conclusion "that when a disability can be considered of a permanent nature the simple test as to whether or not the insured can continue in his regular occupation is not sufficient as a basis for continuation of total indemnity payment." Any other view would, it seems to me, be distinctly contrary to public policy.

Mr. Flynn goes so far as to suggest that there seems to be a place in the disability benefit for partial indemnity for permanent partial disability regardless of whether or not the insured is obliged to change his occupation. This is a most interesting suggestion, a discussion of the ramifications of which would be far too extensive to be within the scope of these brief remarks. The difficulty which Mr. Flynn himself emphasizes, however, of providing some quasi-

judicial means of fixing the precise degree of invalidity, is so great that any actuary would probably hesitate to advise a company to liberalize its contract along these lines.

Mr. Mowbray's quotation from the letter of Mr. J. A. Higham, addressed by him to the editor of the *Insurance Magazine* in 1857, is most interesting and serves admirably to illustrate the point that the inherent merit of a proposal is likely to have much less to do with its general adoption than has its psychological timeliness.

CORPORATE BONDING—RALPH H. BLANCHARD AND GEORGE D. MOORE.

VOL. VII, PAGE 23.

WRITTEN DISCUSSION.

MR. A. R. SEXTON (SECRETARY, FIDELITY AND SURETY DEPARTMENT,
AETNA CASUALTY AND SURETY COMPANY):

The paper is entitled to high praise for the thoroughness and clarity with which the subject has been briefly presented. The comments that I shall offer are accordingly few in number and largely result from the efforts of Mr. Blanchard and Mr. Moore to condense their subject, rather than from any fundamental inaccuracies.

I.

Page 26: Paragraph on Judicial Bonds. Sub-paragraph on Credit Guarantee Bonds.

The statement is made that these bonds "are generally required by law in civil proceedings, in case the principal has in his hands money or property which might be levied upon for the satisfaction of a judgment, and which he might misappropriate." The bonds referred to in this description are limited to those given by a defendant, whereas there are many credit guarantees in court proceedings that are executed on behalf of a plaintiff or complainant who is seeking to levy upon the property in the hands of some other party. Sometimes the complainant is seeking to obtain some remedy in which the payment of money is not involved directly, and, in such case, is not seeking to levy upon property in the hands of anyone. The following classes of court bonds, for example, would not come under the description of judicial credit guarantees, as given in the paper of Messrs. Blanchard and Moore:

Plaintiff's Attachment Bond, Garnishment, Replevin, Petitioning Creditors, Security for Costs, Execution, Injunction, and some others.

Although it is true that bonds written on behalf of plaintiffs are regarded from a practical standpoint as usually less hazardous than

those written on behalf of defendants, it is, nevertheless, true that they are credit guarantees or monetary obligations, and that they are written upon the basis that the applicant for bond possesses the necessary financial strength to pay any damages which may result from the commencement of the proceeding in which bond has been filed. Most of the bonds which I have listed are bonds which are used by creditors who are seeking to collect debts or enforce claims, but an injunction bond does not necessarily involve a debt on the part of either the complainant or defendant. Nevertheless, it may involve damages by reason of preventing the accomplishment of something which, but for the injunction proceeding, would have been done in a certain manner and within a certain time. Injunction proceedings are instituted under many circumstances, all of which it would be impracticable to list, such as injunction against the transfer of stock, the sale of property, the building of a road through certain lands by a certain municipality or county, the collection of a tax, etc.

As will be seen by the foregoing illustrations, the quoted definition of credit guarantee judicial bond should be amplified.

II.

Page 28: Paragraph on Peculiarities of Bonding.

I take issue with the statement that bonding is essentially insurance, and with subsequent references in the paper to this effect. I appreciate that undoubtedly Mr. Blanchard and Mr. Moore had clearly in mind the distinction which I shall point out and only employed the word "insurance" in a very broad way. I would have no objection to the employment of the word in that way if the essential distinction between suretyship and insurance were emphasized, but in the absence of such an explanation it is my belief that the employment of the word "insurance" with respect to bonding matters may result in confusion.

It is true that Fidelity Bonds, which simply guarantee the honesty of clerks, etc., are to a large extent rated upon an insurance basis, although the underwriting is frequently special; but the opposite is true as to Surety Bonds.

The difference in the method of determining the premium for a Surety Bond and a Policy of Insurance is explained as follows by Mr. Towner:

"A general peculiarity distinguishing premiums for insurance from premiums for suretyship is that insurance premiums are ordinarily calculated on the average risk for an entire class, whereas surety premiums ordinarily contemplate the coverage of only selected risks of their class. Thus life insurance rates at age thirty contemplate the insurability of all healthy lives at that age. Fire insurance rates on a specific class of dwelling or other fire hazards

contemplate the insurance of all structures within that class, Surety underwriting, however, proceeds upon a different principle, namely, that suretyship shall only be given for those selected applicants who are responsible and who are expected to fulfill an engagement, keep their promises and perform their contracts. These are the selected members of a class: not all of its members, as in the case of insurance. Surety rates can not be computed on the insurance average of all members of a class."

III.

Page 29: Paragraph on Peculiarities of Bonding.

It is stated that the surety is not entitled to indemnification under a bail bond. This statement expresses the theory that the obligation of the surety is to produce the person of the individual bonded, and that, accordingly, anything which makes the surety indifferent to the obligation to produce the body of the defendant in court should meet with the disapproval of the court. Practically, however, bail bonds are almost never executed except upon the basis of indemnification, and this indemnification is usually in the form of cash collateral or its equivalent in the full amount of the bond. In jurisdictions where the court will not permit a surety to take collateral on a bail bond, a prudent surety will not sign a bail bond.

IV.

Page 29: Bonding Hazards.

The second paragraph, beginning "The facts, varying in their importance according to the class of bond in question, are, among others," although it enumerates many of the principal considerations governing the execution of bonds, is so worded as to give undue emphasis to the special considerations governing the issuance of Fidelity Bonds, and it would appear to better advantage if it were rearranged so that first those considerations were enumerated which would apply to Fidelity Bonds, and then those which would apply to Public Official Bonds, and then Fiduciary Bonds, concluding with those applicable to Judicial Credit Guarantees and finally Contract Bonds.

V.

Page 30: Bonding Hazards.

In describing the hazards under public official bonds, it is suggested that in addition to the considerations governing the issuance of a Fidelity Bond the capability of the principal should be considered. There is still another consideration: a public official is frequently an insurer of the funds which have been intrusted to him, and if in such cases he deposits money in a bank and the bank fails,

thereby causing a loss in whole or in part of the deposit, he must make good such loss, or his surety must make good for him, even though the public official has been absolutely honest and has deposited the money in a supposedly strong bank. Therefore, surety companies in such cases usually require the banks in which the public official places his funds to furnish depository bonds which indemnify against any loss of public funds resulting from the failure of the bank.

VI.

Page 31: Paragraph on Premium Rates.

The statement is made that "the loss ratio will be found to be highest in the Fidelity classes, which are underwritten with the expectation of a proportion of losses." If—as probably is the case—it was intended by this statement to indicate that Fidelity Bonds are written approximately upon an insurance basis in so far as loss ratio is concerned, whereby the insuring company expects to pay a loss ratio of normal size for the class of business, leaving available to the surety company, after payment of Fidelity losses, a sufficient sum to take care of all expenses and provide a fair profit over all expenditures, the statement is correct. If, on the other hand, it is possible to infer from the statement in the paper that Fidelity Bonds contrasted with other bonds are to be viewed as more hazardous, it is necessary to correct such an impression. In considering the desirability or undesirability of Surety or Fidelity Bonds, we, of course, should consider the general history of the business, and its probable future developments, rather than any unusually favorable or unfavorable very recent loss ratios, because business conditions prevailing today are abnormal and undoubtedly will greatly improve in the near future.

Generally speaking, Fidelity Bonds have been regarded as one of the most profitable lines of business written by surety companies, and although under present conditions the experience is not as satisfactory as formerly, and although under special Fidelity Bonds now written the loss ratio is high, it is not unreasonable to expect that with business readjustments, and with gradual revisions of some special recent coverages, this class of business will hold the favorable position in the regard of underwriters that, in the general history of the business, it has always occupied.

VII.

In Conclusion.

The paper written by Messrs. Blanchard and Moore was most carefully prepared and some of my comments have been covered by qualifications of general character found here and there in the paper. Nevertheless, it seems to me that their excellent presenta-

tion of the subject would be somewhat improved if the additional explanations which I have herein suggested were incorporated in the paper.

A SUGGESTED SYSTEM OF STANDARD NOTATION FOR ACTUARIAL WORK
IN WORKMEN'S COMPENSATION INSURANCE—SANFORD B. PERKINS.

VOL. VII, PAGE 36.

WRITTEN DISCUSSION.

MR. A. L. KIRKPATRICK:

It is only necessary to take a hasty glance through our *Proceedings* to notice the multiplicity of symbols used by different writers in dealing with Workmen's Compensation Insurance. Each paper has symbols which are adapted to meet the needs of the situation at hand. Some writers even use the longhand method of writing out their formulae in words rather than symbols.

A few symbols have now come to be generally used as standard, although sometimes with slight variations. For instance, z_1 , z_2 , K_1 and K_2 as used in the experience rating formula are, I believe, generally recognized. Such symbols as P and π are usually used to represent premium of one kind or another and R to represent rate. Mr. Perkins's paper would qualify these by the use of subscripts to indicate premiums earned, written, unearned and ultimate. He has added a further qualification, using the method which he applied to losses, to indicate the State in which the premium was written, the year and classification.

Probably no one realizes the need for standard symbols more than those who have recently followed the development of a new schedule-rating formula. When a committee attacks a common problem and each member starts working in his own way and using his own symbols, the result is like a meeting of men speaking different languages. Until they all adopted the same language it was a rather difficult job to follow from one memorandum to the next.

For example, N was used to represent the number of employees in a risk. Somebody else decided to use N as the number of danger-points in the risk. R was used by one to represent manual rate; by another it was used to represent residuum or non-schedule ratable portion of the pure premium.

As soon as the work had progressed far enough so that there was an agreement as to fundamentals a standard set of symbols was adopted. It may be well to give them here. In the formula

$$\pi' = \frac{\epsilon'}{\epsilon} \left(R + \frac{N}{N'} \sum \frac{N_i' D_i'}{N_i D_i} \pi_i \right)$$

- π' represents the pure premium for a particular risk.
 ϵ represents the personnel factor for the average risk, and
 ϵ' is the same factor for the risk in hand.
 R represents that portion of the pure premium produced by minor or uncertain causes and called residuum.
 N represents the number of employees in the standard plant, and
 N' the number in the plant being rated.
 N_i represents the number of employees exposed to cause of accident i in the standard plant, and N_i' the number exposed to the same cause in an individual plant.
 D_i represents the number of danger-points involving cause i in the average plant and D_i' the number in a particular plant.
 π_i represents the pure premium produced by cause i and entering into the manual rate.

One thing must be borne in mind in adopting standard symbols, namely, that it is more important to have symbols which are easily recognized and remembered than to have short ones. For this reason, it is my opinion that it would be better to use the ordinary abbreviations for States than to try to develop another set of symbols, even though they may be more simple.

This Society had at one time a committee on standard notation, but it has been discontinued. Now that Mr. Perkins has opened the subject, it might not be amiss for that committee to be revived and some efforts made toward the adoption of standard symbols, using his paper as a working basis.

MR. G. F. MICHELbacher:

Mr. Perkins's paper is timely, for even though all of us may not be ready to accept in detail the notation which he proposes, none of us can fail to appreciate the necessity for opening this subject for immediate discussion. We most certainly have reached a point in the development of casualty actuarial science where the lack of a simple, comprehensive system of notation is becoming extremely embarrassing. Rapid strides forward are being made in practically all the important branches of the business, and such notation as is being used in practice and in papers presented before this Society demonstrates rather clearly that because of our failure to attack this problem cooperatively we are creating several different systems of notation which it will be difficult to harmonize unless steps toward this end are taken without further delay. I hope, therefore, that one result of the discussion of Mr. Perkins's paper will be the development of appropriate plans for a thorough analysis of the notation problem as it affects, not workmen's compensation insurance alone, but every other branch of casualty insurance as well, and that this analysis will lead to the establishment gradually, if need be, of a simple universal notation which all of us can use in

our scientific work, irrespective of the branch of casualty insurance in which our activities may be applied.

Early in the history of our Society some thought was given to this problem, and, in fact, at one time our Council established a special committee on "Terms, Definitions and Symbols" for the express purpose of creating a satisfactory system of notation for casualty insurance. It was found, however, that scientific work in this field had not progressed far enough and had not become sufficiently standardized and it was decided, therefore, to drop the subject and to abolish the committee. Under the circumstances this action was undoubtedly justified, but there is every indication that the intention was not to drop the subject permanently, but rather to await a more appropriate time for the development of a uniform system of notation. With the progress that has been made in scientific work affecting particularly workmen's compensation, accident and health, and automobile insurance, there can be little doubt today as to the necessity for the prompt reestablishment of this committee. The committee, if it is revived, faces a difficult task, but this is an opportunity for the Society to make a most important contribution to the business of casualty insurance; an opportunity which we can not afford to overlook.

Turning now to Mr. Perkins's paper, I may say that what I have to offer by way of discussion is not based upon any detailed analysis of the problem. If I were to accept the fundamental basis upon which Mr. Perkins has built his notation, I doubt whether I would seriously criticize the details. There are individual symbols here and there which I might criticize, but these criticisms would be trivial and for the most part unimportant. I find, however, that I have a conception of what a proper and adequate system of notation should be, which evidently does not correspond with Mr. Perkins's conception of the nature of his problem. My contribution to the discussion will, therefore, deal with the subject in general terms rather than in terms of any exact system of notation.

Mr. Perkins's notation is highly pictorial. He has accomplished exactly what he set out to accomplish, viz., the reduction to terms of symbols of the process of constructing workmen's compensation rates developed by the National Council on Workmen's Compensation Insurance during the recent national rate revision. His notation is so designed that the entire rate-making process may be stated symbolically even to the point of enumerating such items as the identity of individual classifications, the years of issue represented by the available experience, the state for which rates are being made, etc. Such a system of notation undoubtedly has its advantages, but it strikes me that it also has its disadvantages, the principal disadvantage being that it must necessarily be extremely complicated if it is to tell the entire story. For example, the proposal that symbols representing state, years of issue and classification

shall be affixed to the basic notation designating losses, payrolls, pure premiums, rates, etc., means a duplication of these symbols throughout the entire analysis of a particular problem.

It is my thought that we should recognize a definite point beyond which it is impractical to reduce our problems to formulae; our notation should not be too descriptive. We should decide in advance that a certain amount of narrative description must accompany our scientific discussions. Thus if we are set the problem of developing a rate for classification No. 3632 for New York for 1921, and have as materials for this the experience for certain states and for certain policy years, I should say that the proper thing to do would be to preface our calculations with a statement of these facts and then to proceed with the problem, developing our formulae in terms of general symbols.

With such a conception of notation it is possible, I believe, to establish a few general symbols and largely to eliminate the necessity of using the same superscripts, subscripts and what-nots over and over again, for the purpose of designating certain factors that run through the entire calculation. Furthermore, I have the feeling that if this idea were developed it would be possible to apply practically the same notation to all branches of the business which in itself would be a great advantage.

My contribution, therefore, comes down in the final analysis to a plea for a *simple* and *universal* system of notation. I would not have one notation for workmen's compensation insurance and another for accident and health insurance if I could help it. The problem should be attacked fundamentally by determining what symbols are needed in the various branches of the casualty insurance business and by attempting to meet these requirements by a few symbols of wide application supplemented, if necessary, by a limited number of special symbols for individual branches of the business which require separate treatment because of peculiarities.

MISS OLIVE E. OUTWATER:

Those who have been in the work of compensation rate-making during the last three years have felt keenly the need of a uniform and well-known system of notation. Mr. Perkins is peculiarly well fitted to develop such a system because of his close acquaintance with the actuarial problems of compensation rate-making during the recent 1920 revision. His paper discusses the entire rate-making process and develops a comprehensive notation applicable thereto. The symbols are logical and he has adhered to a uniform system of subscripts, superscripts and prefixes.

Systems of notation are usually of slow growth, each term being chosen as the clearest and most convenient way of abbreviating an expression. As a result the symbol must be suggestive of its meaning, and in the development of a standard system for general use

clearness and practicability should not be sacrificed to uniformity. It is not necessary to adhere so strictly to a two-letter code for all States that one must remember, to use, for example, Hm for New Hampshire instead of the N. H. in general use. Again, the expression Yr is apt to be confused with the standard abbreviation for year, and, except for uniformity, is no improvement over the generally recognized N. Y. Such symbols are undoubtedly adapted to a coding system, but their use requires the memorizing of the entire system. Not only should the notation be logical and suggestive of the meaning represented, but it should also conform as far as possible to any standard well-known abbreviation. The code system has also been followed closely in the use of the symbols DC, IC and MC to represent death, indeterminate and medical, respectively. Apparently C is used merely to complete a two-letter code, and the confusion resulting from the use of a superfluous letter more than offsets the lack of uniformity which would result from its omission.

Those who will most frequently use a system of notation such as this must often issue memoranda involving its use. These memoranda must be typed, and here they encounter the difficulty of copying the Greek letters, which usually must be put in by hand. Greek letters are in general use in mathematical treatises, but it would seem that the practical difficulties arising from their use in the work of compensation actuaries make it advisable to avoid them if possible. This point has been well illustrated in the recent study of schedule rating which has been made by the National Council. The use of π might be avoided by using the symbol p with a superscript B to indicate the basic pure premium. L. R. has become generally known as an abbreviation for loss ratio and its use would obviate the necessity of using the Greek letter ρ . During the rate revision the Actuarial Committee of the National Council have used "a" to designate an amendment factor. It was originally intended for alpha, but because of the difficulty in typing became "a" in general practice.

In order to become well known a system of notation must be frequently used. If it contains too many complicated terms, many of which are seldom used, it tends to become confusing, especially to the beginner. It is doubtful whether even those actuaries who are constantly in touch with compensation rate-making will ever memorize so complicated or elaborate a system of notation. Such expressions as "Number of temporary total cases in the American Accident Table with the duration of disability of more than thirty weeks," the symbol for which is given as ${}_{30}TT$, will be seldom used, and because of that fact will never become well-known expressions. The purpose in developing such a system of notation is to secure abbreviations for terms and expressions in frequent use, and superfluous terms become merely an encumbrance.

Mr. Perkins has not designated any symbol for premium and loss development factors. Such ratios are used in developing projection factors and the present indications are that they will also be used in developing rates for other forms of casualty insurance. So far no abbreviation has been used for these expressions and it would be well if such symbols might be developed as a part of the standard notation.

AN AMERICAN ACCIDENT TABLE—OLIVE E. OUTWATER.

VOL. VII, PAGE 57.

WRITTEN DISCUSSION.

MR. E. H. DOWNEY:

The *American Accident Table* is constructed upon the same general plan, from materials of much the same sort, and by much the same methods as the famous *Standard Accident Table* of Dr. Rubinow. It presents, not the actual severity distribution of accidents in a given experience, but the hypothetical distribution of injuries in a synthetized experience.

Dr. Rubinow relied mainly upon European experience, had in different countries, under dissimilar laws, and compiled upon disparate plans. The compilers of the *American Table* confined themselves to American data, gathered from many States, accumulated under unlike laws and compiled in dissimilar ways. The synthesis in each case is effected by a species of interpolation, grounded upon the assumption that experience in any one jurisdiction is typical of universal experience, and that what is omitted from one statistical series may, without misgiving, be supplied from another. The close similarity of results in the two compilations may go far to justify the method.

Few of the American Commonwealths compile or publish accident statistics of any sort, and no two of these issue their statistics in comparable form. Dependable data are limited altogether to compensable accidents and the definition of compensable accident is far from uniform. To get over this difficulty the compilers of the *American Table* adjusted the number of compensable accidents in States with a long waiting period to the relative number reported in States with a shorter waiting period. Similar adjustments were made in the number of major and minor permanents and even of permanent totals. For it is obvious that few minor permanents will be recorded in a jurisdiction which compensates such injuries on the basis of temporary total disability only; that the number of major permanents, not dismemberments, will be greater in a jurisdiction which provides specific indemnity for such injuries than

under an act which allows compensation only for loss of earnings, and that the number of permanent total disabilities recognized as such will be greater where life pensions are allowed than when compensation is limited to four hundred weeks. Lastly, the relative number of major permanent disabilities is greater in a mature experience than in an experience of four or five years. These considerations doubtless account for the relative deficiency of serious injuries in the *American Table* as compared with the Rubinow Table.

Within the limits imposed by the data used and the methods employed the work is admirably done. No better compilation could be hoped for from the American data now available. Miss Otwater's presentation is likewise excellent.

Apart from shortcomings inherent in the incommensurable character of the basic statistics, a question may here be ventured as to the utility of any standard accident table which purports to cover all industries. For the purposes of a general survey of industrial injuries we need, not a sample, but the total experience. For the purposes of compensation legislation in a given State we need, not a hypothetical cross-section of country-wide experience, but the actual experience of the given State. And for the purpose of rate-making we need, not the severity distribution of accidents in general, but the severity distribution of accidents in particular industries. The number of fatalities per 1,000 compensable accidents in Pennsylvania experience (waiting period, two weeks) is 63 in anthracite mining, 60 in iron erection, 55 in stone quarrying, 20 in rolling mills, 10 in machine shops, 10 in silk manufacturing, 6 in cigar making. The number of major permanent disabilities per 1,000 compensable accidents, in the same experience, is 4 in department stores, 20 in machine shops, 42 in stone quarries, 90 in laundries. The relative frequency of the several permanent injuries is likewise variable—mostly eyes in quarries, mines and foundries, mostly hands in laundries, bake shops and sheet-metal establishments. So also with dependency distribution and remarriage rates—what holds for bituminous mining will not hold for the building trades nor the textile industry. There is even some reason to suppose (though the fact has not been ascertained) that the duration of temporary disability varies markedly from industry to industry. For most of the purposes which it may be applied, in short, a generalized accident table is rather calculated to mislead than to inform.

CARL HOOKSTADT:

Six years ago Dr. I. M. Rubinow published his famous Standard Accident Table which gives the severity distribution of any given 100,000 industrial accidents. This table, which has been extensively used in the formulation of compensation insurance rates, was based primarily upon European statistics, since little reliable accident experience in the United States was available at the time.

Since then sufficient American experience has developed to allow the compilation of an accident table based upon American accident statistics. Such a table has been constructed by Miss Olive E. Outwater, actuary of the National Workmen's Compensation Service Bureau. The severity distribution of this American Accident Table was determined from two sets of data. The distribution of the compensable accidents was based upon the returns made by insurance carriers to the National Council on Workmen's Compensation Insurance as shown by Schedule "Z," while the distribution of non-compensable accidents was based on the reports of certain State industrial accident commissions.

The following tabular statement shows the severity distribution according to each table:

Type of Injury	Probable Distribution of a Given 100,000 Accidents According to the	
	American Table (Outwater)	Standard Table (Rubinow)
Total	762	932
Permanent total.....	62	110
Permanent partial.....	3,788	4,765
Temporary total.....	95,388	94,193
Total	100,000	100,000

An analysis of the Standard and American tables shows a remarkable similarity of distribution of fatal, permanent total and permanent partial disability accidents. This is brought out more clearly in the following table, which shows the numerical relation of each group to the others:

Type of Injury.	Number of Accidents According to		Percent of Accidents of to	
	American Table.	Standard Table.	American Table.	Standard Table.
Fatal.....	762	932	16.5	16.0
Permanent total.....	62	110	1.3	1.9
Permanent partial...	3788	4765	82.1	82.1
Total.....	4612	5807	100.0	100.0

It will be noted that the percentage of permanent partials is exactly the same in each table, namely, 82.1 percent, while the percentage of fatals is .5 percent more and the permanent totals .6 percent less in the American table than in the Standard table. The American table, being based exclusively upon the accident data of insured employers, does not include a large proportion of the mining and steel industries, which carry their own risks. In these the

fatality and permanent total disability rates are proportionately high. Had the accident experience of all employers, insured as well as self-insured, been taken into account in constructing the American Accident Table, it might have produced slightly different results.

As regards the temporary total disabilities, the two tables show considerable variation. According to the American table, the ratio of the combined fatals, permanent totals and permanent partials to temporary totals is 1 to 20.8, whereas according to the Standard table this ratio is 1 to 16.2. The former table, therefore, produces a relatively greater number of temporary totals. This disparity between temporary totals and non-temporary totals is sufficiently great to raise the question of accuracy. Inasmuch as the ratios between fatals, permanent totals and permanent partials is practically the same in each table, it can probably be safely assumed that these ratios are correct, and that the error lies with the temporary totals. Either the number given in the American table (95,388) is too large or the number in the Standard table (94,193) is too small. In my judgment the American table produces too great a number of temporary totals as compared with all other accidents. This is due to the compiler's faulty method of computation, particularly to the use of inaccurate, dissimilar and uncomparable accident data in State reports.

As already noted, the distribution of compensable accidents in the American Table was based upon Schedule "Z" returns, while the distribution of non-compensable temporary total disability accidents was based upon the accident reports of State industrial commissions. To obtain the greatest possible exposure the data of every State in which the statistics were presumably comparable were used. The number of accidents under 14 days was based upon the data of five States (California, Ohio, Oregon, Washington and West Virginia), but the distribution of this total into days was made upon the California data alone, since no other statistics were available at that time. While it is essential that the exposure be sufficiently large to eliminate chance variations, it is even more important that the data used be accurate and comparable. Merely to increase the accident exposure by adding together an agglomeration of figures without regard to their accuracy or comparability does not necessarily increase its dependability. In fact, enlarging the exposure by the inclusion of inaccurate data decreases its dependability. The 95,388 temporary total disability accidents in the American table are stated to be tabulatable accidents—*i. e.*, those in which the disability extends beyond the day or shift on which the injury occurred—and inasmuch as these figures are based upon State accident statistics, it follows that the latter should also include only tabulatable accidents. Again, in order that the statistics of the several States may be comparable, all of the industrial acci-

dents which occur should be reported; in other words, there should be complete reporting. It is exceedingly questionable whether either of these two conditions obtain in the State data used. In some of the States the statistics in all probability include non-tabulatable accidents, while in one State, at least, undoubtedly a large proportion of the minor accidents are not reported.

The following table shows the percent of temporary total disability accidents of seven days or less:

State.	Percent of Temporary Total Disability Accidents Ending in		
	3 Days or Less.	4 to 7 Days.	7 Days or Less.
Massachusetts (1919).....	17	25	42
California (1919).....	26	22	48
California (1915-1918).....	—	—	49
Oregon (1916-1919).....	—	—	39 ^a
Washington (1913-1917).....	—	—	18
Ohio (1914-1915).....	—	—	54
Ohio (1915-1916).....	—	—	60
W. Virginia (1913-1914).....	—	—	47
Standard table.....	—	—	40
American table.....	25	22	47

It will be noted that the percent of accidents whose disability ends in 1 week or less ranges from 18 in Washington to 60 in Ohio. Massachusetts (42 percent), Oregon (39 percent) and the Standard table (40 percent) are approximately the same as are California (48 and 49 percent), West Virginia (47 percent) and the American table (47 percent). The great variation in Washington (18 percent) may be due to a low minor accident frequency rate in the State or it may be due to the fact, which is obviously the case, that a large proportion of these minor accidents are not reported. Oregon with similar industries shows 39 percent under eight days.

Let us examine in more detail the accident statistics of each State under consideration and see just what accidents are included. Massachusetts, as far as I know, is the only State in which non-tabulatable disability accidents are definitely excluded from its accident statistics. California excludes the no-disability accidents from its tabulations, but apparently includes all disability accidents whether tabulatable or not*. Furthermore, California shows a large number of one-day disability accidents. When one considers that in Oregon and Indiana (the only other States in which such data are available) the number of accidents of one day's disability is less than those of two days' disability, there is a strong presumption in the belief that the California figures include accidents of less than one day's disability; in other words, it includes non-tabulatable accidents. In Oregon, which has no waiting period, all disability

* 1916, 34 percent; 1917, 36 percent; 1918, 42 percent; 1919, 41 percent.

accidents are compensated and presumably reported. In Ohio, which shows the largest percentage of accidents under eight days (54 to 60 percent), all accidents requiring medical aid must be reported, whether or not such accidents result in time loss. Possibly the Ohio figures also include a number of accidents resulting in no disability and requiring no medical aid. There is nothing in the Ohio report which shows what accidents are or are not included in the tables used. In West Virginia all disability accidents are required to be reported. Since the accident report does not state whether the tabulations include only tabulatable accidents, it is probably safe to assume that these tabulations include all disability accidents reported, whether tabulatable or not.

In view of their dissimilarity the above figures can not be combined for purposes of comparison. It is like trying to ascertain the correct time by taking an average of several clocks; such an average can only be accidentally correct. Furthermore, any errors due to dissimilarity in the data used are magnified by the weighted nature of the data. For example, the two States of California and Ohio account for over 200,000 of the 223,000 accidents under eight days used in the American table. These two States show the highest percentage of accidents under eight days, and if they contain non-tabulatable accidents, as is apparently the case, their very preponderance will aggravate the error.

Another factor which will effect the distribution is the fact that the compensable accidents as shown in the tabulations of the State reports used have been adjudicated by the commissions and the non-industrial accidents have presumably been eliminated, whereas such non-industrial accidents or those not arising out of the employment have not been eliminated from the non-compensable accidents. The ratios based upon these figures, therefore, would not be accurate, since the non-compensable accidents embody certain types of accidents not found in the compensable classes.

Because of the inclusion, therefore, of non-tabulatable accidents the reduction or conversion factors used by the compiler of the American Accident Table are too large, and consequently the number of temporary total disabilities thus produced in this table is too large. In my judgment more reliable results would be produced if a smaller exposure were used, if such data is reasonably accurate and complete, than to use a large exposure composed of incomplete, dissimilar and incomparable data. I believe that the accident data of Massachusetts, which probably has the most complete and most accurate system of accident reporting, would produce more accurate results than the method followed in the construction of the American Accident Table. Incidentally it may be noted that the Massachusetts distribution approximates that of the Standard Accident Table.

The distribution of temporary disability accidents under two

weeks in the American Accident Table is based upon the combined data of the five States mentioned, but the distribution by days, as already noted, is based exclusively upon the California data, inasmuch as these figures were the only ones available. According to the California data, the one-day accident group is the largest, the number gradually decreasing up to the seventh day. I question whether such a distribution is in accordance with the actual facts. As already noted, the one-day group undoubtedly contains a number of non-tabulatable accidents. Furthermore, the Oregon and Indiana statistics show an increasing number up to the third day, while an analysis of the accidents in the iron and steel industry shows the number to increase up to about the seventh day. Usually in the case of a minor injury the workman will return to work the day following the injury, if at all possible. If the injury is severe enough to prevent the worker from returning to work the day after the injury, it is severe enough to disable him for three or four days, since it will require several days for the bruise or laceration to heal.

Another factor which perhaps will affect the accuracy of the American Accident Table is the fact that as far as compensable accidents are concerned the distribution was based exclusively upon the experience of the insured employers. A large bulk of the iron and steel industry and mining industries, for example, are not insured and consequently their experience is not incorporated in Schedule Z. Inasmuch as these industries have relatively high fatality and permanent total disability rates, their exclusion would produce a distribution in which the number of fatalities and permanent total disabilities would be too small.

The great variation in the severity distribution of accidents between coal mining and all other industries may be seen from the following table, which shows the accident rates per \$10,000,000 payroll by industry and by type of injury in Pennsylvania for the years 1916-1919.

Industry.	Accidents per \$10,000,000 of Payroll.		
	Death and P. T. D.	Major Permanent.	Temporary Compensable.
All industries except coal mining ..	6.9	5.2	223.7
Anthracite mining.....	50.6	14.9	675.0
Bituminous mining.....	27.0	12.5	531.0

I would also suggest that the distribution of temporary total disabilities be carried one week further and show the number of accidents in which the disabilities end in the twenty-sixth week. The American table stops just one week short of a half year.

The above suggestions and comments, needless to say, are not offered in a spirit of criticism, but in the hope that they may be of some assistance in the formulation of a more accurate and scientific American Accident Table.

AUTHOR'S REVIEW OF THE DISCUSSION.

MISS OLIVE E. OUTWATER:

One of the fundamental principles of insurance is that losses shall be distributed among those exposed to risk. Not all those who are exposed will suffer loss, but premiums are allotted according to the value of the risk's expectation of loss, as nearly as that value can be determined. In the early days of insurance losses were distributed equally without regard to variations in hazard. As insurance advanced, attempts were made to distribute premiums in proportion to losses expected, and various degrees of refinement have been attained in different lines of insurance. We have not yet reached the point, however, where we can measure the exact hazard of any risk, and we are still compelled to use approximations and averages to a greater or less degree. In the process of rate making for workmen's compensation insurance an accident frequency table has been required and the American Table was compiled during the recent rate revision as an average table for all insured industries. Mr. Downey in his criticism questions the utility of any standard accident table which purports to cover all industries. An accident frequency and duration of disability table for each industry would undoubtedly be a great help in measuring the true hazard of classes of industry. But no one industry has yet produced enough accidents, complete records of which have been kept, to furnish a dependable accident table. The distribution of accidents as to nature of injury and duration of disability varies greatly from one industry to another. No accident table could possibly fit all industries. This point has been well illustrated in Mr. Downey's criticism. However, rate making and the accumulation of statistics have not yet reached the stage where it is possible to entirely avoid the use of an accident table, and because of the impossibility of compiling a table for each industry use is made of an average table. Until more statistics are available we must either use an average table or none at all. It may be that in the next rate revision we will be able to avoid the use of a formal accident distribution, but that time has not yet been reached, and the use of an average table until greater refinement can be secured does not conflict in any way with the principles of insurance.

In Mr. Hookstadt's criticism the accuracy of the American Accident Table is questioned because, as far as compensable accidents are concerned, it is based exclusively upon the experience of insured employers. Perhaps we did not make clear the purpose of the American Accident Table or its limitations. No attempt was made to compile a table which should be an average for all industries in the United States. As stated before, such a table would not fit any industries except those which approximate the average. This table

was compiled for use in the 1920 revision of workmen's compensation rates, and the average required was therefore not an average for all industries in the country, but rather for those industries insured in participating and non-participating insurance companies. The inclusion of the experience of self-insurers, were it available, would therefore tend to inaccuracy rather than accuracy for our purpose. Had the high fatality and permanent total rates of self-insured mines and iron and steel plants been included in the tabulation, insured industries would be charged with too high an average D. & P. T. D. rate.

Mr. Hookstadt believes that the number of temporary total disabilities given in the American Accident Table is too large and bases his conclusions on the use of "inaccurate dissimilar and uncomparable accident data in State reports." He questions these statistics first as to completeness of report and second as to the inclusion of tabulatable accidents only. His criticism is valid concerning the Washington data. We have the statement of Mr. Harris, statistician of the Department of Labor and Industries of the State of Washington, that prior to 1917 injuries resulting in two or three days' time lost were seldom reported. The number of cases in the Washington data was comparatively small and the effect of its elimination would be to increase rather than decrease the number of temporary total cases in the table. California, whose statistics make up nearly half of the total used in this compilation, does report non-tabulatable accidents, but they are reported as such and were not included in the tabulation used for the Accident Table. We have a statement from the Industrial Accident Commission of California that tabulatable accidents are defined as accidents resulting in disability which lasts beyond the day or shift on which the injury occurred. The figures given in Table B, if checked with the original figures in the California reports, will show that only tabulatable accidents are included.

We endeavored to get a definite statement from the Industrial Accident Commission of Ohio as to the exact extent of their reports, but were unable to obtain any information. The Ohio figures, however, do not vary widely from the California statistics.

Mr. Hookstadt refers particularly to the Massachusetts statistics as definitely excluding non-tabulatable accidents. At the time the American Accident Table was compiled all available Massachusetts reports included all non-fatal injuries in temporary total disability distributions. It was therefore impossible to use these figures which included disability in P. P. cases in making up a table of disability for T. T. cases only. However, since that time two Massachusetts reports have appeared giving the distribution for temporary total only. Combining the data for California and Massachusetts, two States producing a dependable volume of experience and concerning whose statistics there is no doubt, the following distribution is secured:

Duration.	California.	Mass. 7-1-17 to 7-1-19.	Total.	Percent.	Percent in American Accident Table.
1-3 days.....	54,311	23,538	77,849	22.6	25.4
4-7 days.....	46,456	36,617	83,073	24.1	21.7
8-10 days.....	20,628	13,746	34,374	10.0	9.3
11-14 days.....	18,825	11,504	30,329	8.8	9.2
2-4 weeks.....	29,487	24,568	54,055	15.7	18.0
4-8 weeks.....	23,077	19,100	42,177	12.2	10.7
8-13 weeks.....	7,405	6,377	13,782	4.0	3.2
13 wks. or over.....	4,346	4,550	8,896	2.6	2.4
	204,535	140,000	344,535	100.0	99.9

It will be noticed that the addition of the Massachusetts figures decreases the percentage for the first three days, but increases it for the fourth to the seventh days, leaving the total percentage for the first week almost exactly the same as that in the American Accident Table. On the whole it seems highly satisfactory that the combination of the statistics of two States so widely separated in nature of industries, as well as geographically, should show so little variation from the figures of the American Table.

One question still remains, however. Should the distribution curve increase for the first two or three days, as Mr. Hookstadt seems to believe, or should it constantly decrease from the beginning as does California? The Oregon and Indiana statistics to which Mr. Hookstadt refers are too limited in extent to prove anything, nor do we know the exact nature of the reports. The Massachusetts statistics are not given by days, but they indicate a different-shaped curve than California. It may be that this difference is due to the difference in industries between the two States. Our table purports only to be an average table and as such can not follow exclusively either curve. Moreover, time lost varies with industrial conditions and is undoubtedly different for periods of high wages and plenty of work than for periods of low wages and much unemployment. Since no State for which Schedule "Z" was reported had during 1916 and 1917 a waiting period of less than one week, the reduction factors used to obtain tabulatable from compensable accidents would not be affected by this question, and I see no reason for believing that the number of T. T. disabilities in the frequency distribution is too large. The fact that it is larger in proportion to number of serious accidents than is that given in the Standard Table is quite to be expected. If extensive safety campaigns, the accident prevention work carried on by safety experts, and the guarding of machinery in our American factories have been of any avail, the severity as well as the frequency of accidents should have decreased.

Suggestion is made that the distribution of temporary total be

carried out for one more week, thus completing the half year. This was not done originally, because the available statistics gave us no information as to number of accidents terminating in the twenty-sixth week. However, a value has since been interpolated by Mr. Dorweiler for use in the construction of his disability tables. He assigned 40 cases to the twenty-sixth week, leaving 569 cases for the period greater than six months.

GROUP HEALTH INSURANCE—JAMES D. CRAIG.

VOL. VII, PAGE 78.

WRITTEN DISCUSSION.

MR. WALTER I. KING:

As Mr. Craig's paper is a résumé of general principles underlying the writing of Group Health Insurance, it doesn't lend itself to criticism, constructive or destructive, yet I believe that it is a valuable paper for the members of this Society, and our appreciation is due him for the able manner in which, in his customary way, he has filled a need.

The underwriting of Group Insurance is a distinct science about which we still have much to learn. There are certain general principles which, if followed, will save considerable loss during the constructive period. These are very well outlined in the paper.

In addition to the background given Group Insurance in the opening paragraph of this paper, I would like to add my own ideas as to the economic, or the philosophic, if you please, basis of Group Insurance.

In workmen's compensation laws we recognize that the cost of industrial accidents, and under certain circumstances industrial diseases, are a legitimate charge against the cost of production. This theory, in its broadest sense, says that the family that furnishes the worker to an industry is entitled to compensation through adverse circumstances, provided the causes of circumstances arise out of the industry. More enlightened management is beginning to realize that other adverse circumstances over which the employee or his family has no control are worthy of consideration, and to a certain extent the cost is a legitimate charge to production. Chief among these are unemployment, sickness and death. Group Insurance cares for the last two—*i. e.*, sickness and death—Group Disability Insurance the former, and Group Life Insurance the latter. Group Disability Insurance, then, continues the wage to the employee's family during the sickness of the wage earner and Group Insurance after his death, and to this extent, therefore, they are one and the same thing, and as such the underwriting rules appli-

cable to one would likewise be applicable to the other. They are both Employers' Insurance granting insurance coverage to groups of employees, and the laws which govern the morbidity rate on the one hand, or the death rate on the other, are laws found only in groups of employees. If we are to have its true morbidity experience, therefore, Group Insurance should only be written on employee groups where its true function can be performed. Any other group of people not all employed by one employer would give a different rate of morbidity or mortality, because there would be many extraneous influences affecting the rate, and a company writing such insurance would experience an entirely different cost than is ordinarily found in Group Insurance.

Mr. Craig has pointed out that the rules limiting Group Disability Insurance are very similar to those limiting Group Life Insurance. The reason for this is obvious in light of the above explanation.

One of the chief characteristics of Employers' Insurance of employees, therefore of Group Insurance, which affects the rate of morbidity or mortality is the absence of self-selection on the part of the individuals insured. As a rule, the insurance is given by the employer to his employee. He makes all decisions in regard to it as to the amount of coverage and the time of coverage, thus eliminating any personal selection and its adverse effect on morbidity or mortality. In the event of a joint contribution between employer and employee the matter of personal selection of necessity enters. It is therefore necessary to eliminate, as far as possible, the adverse effect of this selection. Such an attempt was made by requiring that if any group is to be covered on a contributory basis at least 75 percent of the eligible employees be so covered. This is quite as necessary in Group Disability Insurance as in Group Life Insurance. This fundamental principle must be adhered to, as any deviation from it will markedly affect the cost of the insurance. It seems more necessary to bear down on this point in connection with Group Disability Insurance than with Group Life Insurance, as the rate charged for Group Disability Insurance is uniform at all ages, and therefore this form of insurance more readily lends itself to a joint contribution basis, and is more often sold on that basis.

In charging a uniform premium at all ages it is quite necessary that we watch it for the extremely high age groups. These are bound to give a high rate of morbidity and should be more carefully selected.

Contingencies Covered.

This division of the subject can only be intelligently surveyed by taking into consideration the function which Group Disability Insurance attempts to perform. If the purpose of granting Group Disability Insurance is to continue the wages of disabled employees, or at least a portion of them through period of disability, it is nec-

essary to make the coverage broad enough to cover this want effectively, but not so broad as to grant unemployment insurance under the name of Group Disability Insurance. Thus, while we must be open-minded and broad-minded in the rules regulating the contingencies covered, it is the one place where the results of the moral hazard will more quickly react against the company, if not closely guarded.

In commenting upon the various features of the contingencies covered mentioned by Mr. Craig, I would like to call attention to his statement that the disability must be contracted during the term of the policy. I do not believe that we can be too technical in insisting that the disability be contracted during this period. If an employee be working at the time the insurance contract is consummated, even though he has in incubation the germs of typhoid fever, scarlet fever or any other disability, I believe when this disability occurs it is an obligation which the insurance company must meet. We can not be too technical in the handling of our Group Disability Insurance.

Coverages.

It may seem to some of us that limiting the amount of coverage granted under Group Disability Insurance to two-thirds of wage is a hardship and not sufficiently broad-minded. It is perfectly true that the expenses of the working man increase while he is disabled, and from that viewpoint his income, in reality, should be greater. At the same time, human nature is such that no premium would be adequate to cover the cost of a policy which would pay a man more during a period of disability than he was able to earn while well. Our own experience is perfectly clear that the rate of morbidity increases in direct ratio with the coverage granted under a policy. The groups paying a \$10-a-week benefit, irrespective of wage, have a much lower morbidity rate than the groups paying 80 percent of wage, the maximum ordinarily granted. In other words, at the present time, at any rate, we have not a sufficient control over malingering to allow the insurance business to bear full cost of loss of wage arising from disability. This loss must be born by the employee and the employer jointly if we are to eliminate malingering. It seems quite necessary, therefore, especially in view of the fact that in Group Insurance one has no check upon the other amount of insurance carried, to limit the group disability coverage to two-thirds of wage.

Adverse Selection.

In considering the subject of adverse selection, Mr. Craig has viewed it more from the point of adverse selection exercised by the individual in the risk. There is an adverse selection exercised by groups which is worthy of consideration. This may be conscious or unconscious, but among groups of apparently the same class we

find wide variance in the rate of morbidity or mortality. We can only conclude, therefore, that the peculiarities surrounding the individual groups need our careful consideration not only at the inception of the contract, but throughout its history. This point can well be illustrated by two cases—one a store in Massachusetts and the other a manufacturing plant in Connecticut.

In the case of the store the management had worked out a bonus system whereby the clerks received a certain percentage of all sales made during a week over a certain amount. Under this scheme it was quite possible for some of them to earn an extra bonus of \$100 a month if sales were good or if business was good, and they were actively on the job. We covered this case for Group Disability Insurance and had practically no labor turnover and absolutely no malingering, not on account of the Group Insurance, but on account of the bonus system adopted. It is needless to say that the morbidity rate of this case was very low.

To offset this we had a very high morbidity rate on a manufacturing plant in Connecticut which, to all appearances, was a model plant, and we could not understand at first why we had this high rate. Careful investigation, however, revealed the following facts: It was a contributory case, the employer and employees each contributing 50 percent of the cost, the employer deducting the employee's contribution from his wage, the management collecting from the employees a month in advance. Therefore on every case of termination of employment the management really owed the terminated employee a month's premium which had been deducted on the insurance, as the insurance was supposed to cease with termination of employment. Instead of returning this money the employer maintained the employee's name on the payroll, as far as insurance was concerned, for another month, and the insurance company was consequently paying for unemployment insurance during that time.

These illustrations bring out clearly the necessity of understanding the idiosyncracies, so to speak, of each group, if we are to have a more or less uniform rate of morbidity in our groups.

Commission.

In this connection I wish to commend the attitude of the companies in their attempt to keep acquisition cost at a reasonable basis.

In furnishing Group Insurance the companies can, and are, performing a great public benefit, provided they return service rendered for each \$1 expended. I believe, as a whole, it is essential to return in claims at least 70 percent of premiums collected. Otherwise the insured could better afford to carry this insurance himself. If we are to return so large a percentage, then all expense must be kept at a minimum, paying reasonable compensation for services rendered. I believe the companies are doing this on

the scale of commissions adopted and hope they will continue along the same lines.

MR. J. H. WOODWARD:

We are indebted to Mr. Craig for bringing before us a subject of far-reaching possibilities and concerning which little or nothing has been hitherto contributed to the proceedings of this or other actuarial societies.

In his introduction Mr. Craig shows how group health insurance is a more or less logical development of workmen's compensation insurance on one hand and group life insurance on the other. It grows out of workmen's compensation insurance, because the legal requirement that the employer shall provide indemnity for his employees for disabilities arising out of the employment leads the more enlightened employer to the thought of providing indemnity for his employees for all disability whether arising out of the employment or not. On the other hand, the form of contract and the methods of underwriting follow the lines of development of group life insurance which, in turn, has been strongly influenced as to its technical structure by the fact that it has been introduced and underwritten by companies primarily engaged in the business of individual life insurance.

It is pointed out by the author of the paper that any number of persons affiliated for a certain purpose might conceivably form a group for the purpose of being insured against disability. He then proceeds to explain why the interests of sound underwriting are generally best served when only those groups consisting of employees of one employer are taken as the insurable units. The fundamental reason for this is because, as in the case of group life insurance, group health insurance operates more successfully when the basis of the affiliation of the individual with the group is a more important or fundamental one than that of merely securing insurance and where, therefore, the motive for joining or leaving the group does not have to do primarily with the securing of the insurance. For this reason it is more satisfactory to underwrite groups consisting of the entire number of employees in an establishment than groups consisting of benevolent or mutual benefit associations—whether they are establishment associations or not—which have been formed primarily for the purpose of securing insurance. In the one case we reduce adverse selection on the part of the individual to a minimum; in the other conditions invite such selection both with respect to joining the group and to withdrawal therefrom. There are, however, exceptional groups which are in every way insurable, but which, nevertheless, do not consist of employees of one employer. It is not always easy to formulate reasons why insurance should be denied to such groups.

Experience with group life underwriting has demonstrated that non-contributory groups are more desirable in practice than are groups where the insurance is partly paid for by the employee and where inclusion in the group is voluntary on his part. It is unfortunate that in the field of group health insurance there should be so considerable a demand for groups on a contributory and therefore voluntary basis. The reason for this, however, seems quite natural. Many employers feel that some contribution on the part of the employee is advisable in order that he may not feel that he is being made the object of philanthropy, and that he may fully appreciate the benefits that he is to receive from the insurance. That the employee must pay for a thing if he is to set a proper value upon it is one of the perhaps not unreasonable beliefs of the average employer. His objection to non-contributory schemes is not so much an evidence of parsimony as it is a matter of principle. His insight into the technique of insurance is naturally superficial and he usually fails to give sufficient weight to the disadvantages attending the contributory plan. Another source of the demand for non-contributory plans is the fact, pointed out by Mr. Craig, that many establishments have mutual benefit associations, some of which already undertake to pay sickness benefits, and it is desired to continue the insurance through the instrumentality of the association. It is to be expected that practical experience with the working out of insurance plans and the gradual development of a less individualistic point of view will ultimately tend to increase the demand for groups on a non-contributory basis.

The author states (page 80) that "the contract should be issued to the employer, who should pay a substantial proportion of the premiums, in order to eliminate malingering by making the employee's return to work a matter of pecuniary interest to him." It is not clear how the interest of the employer in the employee's prompt return to work is in any way affected by the question of who pays the premium. It would seem that a better reason for having a substantial portion of the premium paid by the employer is to prevent adverse selection and a dwindling away of the group, by making it as attractive as possible for employees both to come in and to remain in. Further, although the rate of premium charged is the same for all ages, the true rate of disability increases materially from age to age, with the result that there is a considerably greater inducement for the older employees to enter and remain in the scheme than for the younger. Even where the employer contributes a substantial proportion of the cost there is a certain amount of inequity under a contributory plan where the young men pay the same as do the old for their insurance. The parallelism between a contributory group and an old-fashioned assessment association is so obvious as to suggest the dangers to be avoided.

That these dangers are not to be regarded as merely academic is evident from a consideration of the increase in the sickness rate from age to age, as shown in the Manchester Unity experience. Thus the sickness rate in weeks per annum (M. U., 1893-97) for certain age groups is as follows:

Ages.	Rate of Sickness.
20 to 24.....	.90
30 to 34.....	1.06
40 to 44.....	1.58
50 to 54.....	2.75
60 to 64.....	6.31
70 to 74.....	17.40

If, as Mr. Cammack found, the average effective age of the group business is age 40, then where the premiums are being paid half by the employer and half by the employee, the employee at age 20 is really paying for very much more than half the value of his current protection. Membership in the group being voluntary, we need not be surprised to find that the plan makes a greater appeal to the older employees, that the average age may gradually increase, and that we may presently find ourselves confronted by some of the insidious troubles of assessmentism. On the other hand, the fact that the contribution of the employee generally takes the form of an authorized deduction from his wages tends to make withdrawals unlikely once the employee has elected to come in.

It seems particularly important during the early stages of development of a new type of insurance that the terminology which is allowed to grow up should be as far as possible consistent and unambiguous. On page 82 the author refers to the time which is required to elapse after the commencement of employment before the employee comes within the coverage of the contract as the "waiting period." On the previous page Mr. Craig has also used the term "waiting period" to describe the preliminary period of disability in respect of which no indemnity is provided. It would appear desirable to limit the use of the expression "waiting period" to instances of the latter description and to refer to the period which is required to elapse before employees come under the policy coverage as the "probationary period."

On page 89 Mr. Craig refers to some of the difficulties which are encountered where this insurance is written on a payroll basis—that is to say, where the benefit is quoted as a specified percentage of the wages and the premium computed as a percentage of the payroll—and indicates a method for adjusting the premium to take proper account of the probationary period. He says, "some companies, therefore, make a flat reduction of five percent if there is a one month's waiting period, ten percent if there is a three months' waiting period, and fifteen percent if there is a six months' waiting

period." It may well be questioned whether so arbitrary a rule will produce satisfactory results in practice. The purpose, of course, is to reduce the bookkeeping labor which would be involved in separating the insured payroll from the uninsured payroll. Where such a separation, however, is for the purpose of bringing about a reduction in the premium payable, we do not find the same disposition on the part of the employer to lay stress on the amount of labor involved as would be the case where an increase in the premium would be the result. It is evident that such percentage can be only the roughest kind of an approximation and will vary materially according to the rate of labor turnover which is being experienced. It would seem to be a fairer and more satisfactory method to go to the necessary trouble of excluding the payroll actually uninsured.

The possible danger arising through the "risk of other insurance" is referred to in an interesting way. After pointing out the impracticability of reducing the indemnity under the group contract because of additional amounts of indemnity which may be payable to the employee from other sources, it is stated that if this should result in abnormal claims the premium should be increased or the dividend reduced. In view of the relatively small amount of sickness benefits which are generally carried among the industrial classes, the question is an academic one. Mr. Craig's solution, nevertheless, should, it seems to me, be challenged as a matter of theory on the ground that it would tend to encourage malingering, and that it appears to assume that excess losses due to lack of insurable interest may be viewed with indifference provided the insurance company receives proper compensation by way of premiums. It would seem that if the question ever assumed dimensions which would make it of practical importance, the solution suggested by Mr. Craig must necessarily be regarded as contrary to public policy.

Mr. Craig concludes his comprehensive survey of the subject by appending the complete text of a form of policy for group health insurance. There are a good many interesting features in such a contract. Not the least interesting is the fact that the contract purports to be perpetual. At least that is Mr. Craig's interpretation of it. He says (page 84): "There is no cancellation clause. The group policy must be renewed at the option of the employer, but the company reserves the right to adjust the premium rates each year." The policy itself says, "This policy may be renewed from year to year for a further term of one year by and with the consent of the company at such premium rates as may be determined by the company." Assuming that the contract really is perpetual, in case the employer cares to make it so, the same question arises as under group life policies, namely, whether the right to readjust the premium is tantamount, from the standpoint of practical underwriting, to the right to cancel or decline to renew.

Under such a clause it is merely necessary that the legal existence of the employer should be continuous, even though in other respects the enterprise or industry may have absolutely changed in character. This might easily lead a company into a position where it would be compelled to renew a policy on a risk, the character of which was such that, if presented to the company anew, it would not be considered on any basis whatever. For example, an enterprise which at its inception involved nothing more than a clerical office hazard might develop a coal-mining, stevedoring or other hazardous business of very considerable proportions, and a company which would not care to issue disability insurance on such risks would find itself in the position of having one on its books. The practical difficulties of charging and collecting an adequate rate on some risks should not be overlooked, particularly when it is borne in mind that the courts might decline to sanction an increase in rate which to the judicial mind seemed prohibitive or confiscatory. Again, there may be reasons for wishing to cancel the contract which are entirely apart from the question of the adequacy of the rate, such as in the case where a group dwindles in size owing to the cessation of active business operations, and the number of employees becomes far less than the number contemplated under the general theory of group insurance.

In general it would seem that the business of group insurance is still too recent a development, both as respects group life and group disability, to permit it to be known whether non-cancellable policies which may be renewed in perpetuity—even though they reserve to the insurer the right to readjust the rate—will prove to be free from annoying and perhaps embarrassing conditions arising out of contingencies entirely unforeseen at the time the contract was entered upon.

The employees covered under Mr. Craig's contract are determined by what is described as the "formula." It is to be noted that this coverage is independent of whether or not there has been a failure on the part of the employer to furnish to the insurance company the names of all employees as they become eligible for new or additional insurance. This is a desirable provision for the reason that in any event it would be impracticable and unsatisfactory to deny liability in respect of an employee who should have been included, but who, through error, was not reported to the company.

On the other hand, one of the practical difficulties with this kind of insurance is to secure prompt and accurate statements from the employer of the new eligible employees and of increases in insurance on old employees. Failure to secure this information promptly may mean a serious loss of premium income. Some employers are notably careless and delinquent in such matters and the subsequent provision in the policy permitting the company to inspect the payroll or other records of the employer for purposes of verification is an excellent one.

The liberality of the benefit clause, its simplicity and its freedom from restrictions, indicate the high social value of group disability insurance. It is only within comparatively recent years that any insurance company would have had the courage to issue such a contract. After stating that the employee must be "wholly and continuously disabled and prevented from performing any and every duty of his or her occupation," it is further provided that the benefit will continue "until the insured is able to engage in some suitable occupation or employment for wage or profit." This is a liberal provision, indeed, and it would be interesting to know to what extent it tended to increase the duration of disability during periods of industrial depression when there is much unemployment and when it is more than usually difficult for the convalescent employee to find "some suitable occupation or employment for wage or profit."

The contract under consideration has no provision under which the company undertakes to issue for delivery to the insured employee an individual certificate describing his insurance protection. Mr. Craig does not state in his paper whether it is the practice of his company to issue such certificates in the case of group disability insurance, but it would appear to be obviously convenient not to prescribe such a practice in the contract, but to follow it voluntarily where such certificates were desired. In the case of contributory groups especially it may lead to misunderstandings to have certificates outstanding where the employee has not left the employment, but is no longer insured because of the fact that he has discontinued his contribution.

Mr. Craig's remarks on the subject of commissions are of wide general interest. The solution reached of the commission problem in group insurance, both disability and life, is a hopeful factor which augurs well for the permanence and continued success of these lines of coverage.

In developing an appreciation of the high social value of group disability insurance, however, much educational work remains to be done, not merely among the employers who purchase the insurance and the employees who are its beneficiaries, but also among those actually engaged in the business of insurance. Past results with individual health insurance can not be said to have proved brilliantly successful when the tremendous insurable values which are involved are taken into account. It is peculiarly true of group health insurance that in the exploitation of this new field the social viewpoint must be kept constantly in mind and every case considered not merely as an isolated phenomenon, but also after carefully weighing the effect which is to be produced upon the ultimate development of group disability protection. The seedling requires culture different from that given the mature plant and it is possible to kill the development of a new departure by expecting too much

of it or burdening it with too many restrictions at the start. This is not said with any intention of encouraging unsound underwriting, but merely to emphasize the thought that we should approach these matters with as large a vision as possible and not close our eyes to everything beyond the obvious merits and demerits of individual cases.

The fine spirit of cooperation and mutual helpfulness which has been manifested by the companies competing for this line of insurance is a noteworthy achievement. It is in this spirit that Mr. Craig's paper has been prepared, and it will doubtless prove to be an extremely useful means for promoting education on a subject where it is so greatly needed.

AUTHOR'S REVIEW OF DISCUSSIONS.

MR. JAMES D. CRAIG :

Mr. King's remarks are really a valuable addition to the paper, and the detail given by him of some of the problems should be carefully studied by those interested in the subject.

His conception of Group Health Insurance as providing indemnity to a man's family while the man is incapacitated, with the Group Life Policy fulfilling the same function after death, illustrates how the two forms of contract supplement each other.

What has been said about the detail emphasized in Mr. King's remarks applies also to those of Mr. Woodward, but in studying these elaborations Mr. Woodward's closing remarks should be borne in mind where he says that "the seedling requires culture different from that given the mature plant, and it is possible to kill the development of a new departure by expecting too much of it or burdening it with too many restrictions at the start."

It is this attitude on the part of the underwriters that creates certain of the conditions about which Mr. Woodward gives warning. If a liberal contract can be written at a safe premium which is satisfactory to the company, the employer and the employees, too much emphasis need not be put upon the technical aspects. The 5, 10 or 15 percent reduction rule for the different waiting periods was decreed on this principle. The actual calculation would, of course, be more accurate, but if the other method gives satisfaction and relieves the employer of a great amount of expensive work, why insist upon the more technically correct method? The same principle applies to Mr. Woodward's remarks on other insurance; until experience proves that other insurance exists in such volume as to be detrimental to the public welfare, it is much more simple, and apparently more satisfactory to ignore this feature.

Underwriters are, of course, always cognizant of the dangers of over-insurance, and should the future require more stringent regu-

lations in this respect, hearty cooperation of employers can undoubtedly be anticipated.

The reasons why employers should contribute substantially to the cost of the insurance are well brought out by Mr. Woodward in discussing the statement appearing in the paper that this should be done in order to make the employees' return to work a matter of pecuniary interest to the employer. Mr. Woodward gives several reasons why the employer should contribute, but does not just see wherein the early return to work of the employees is of pecuniary interest to the employer under the Health Policy. We had in mind the thought that the cost of the contract as affected by dividends or experience ratings would be a matter of interest to the employer, and that he would be much more satisfied at receiving a dividend or a reduction in the premium for the next year than if no dividends were received, but, on the contrary, the premium rates were radically increased.

The comments on the renewal clause, coupled with the rate-making condition, are interesting, and it may be that conditions may arise under a group policy which would make the group unacceptable as a new risk in just the same way as an individual insured under a Life Policy might find himself in such a physical condition that no life insurance company would issue to him a new policy; but is this any reason why the existing policy should be cancelled?

We note Mr. Woodward's remarks: "Best results with individual health insurance can not be said to have proved brilliantly successful when the tremendous insurable values which are involved are taken into account." But whether or not a business proves brilliantly successful, or whether there are practical difficulties to be overcome, they hardly seem to offer sufficient reason for refusing to renew a contract, provided the other party performs his obligations.

The business is still in its early stages and we do not wish to encourage unsound underwriting, and are therefore very glad that Mr. Woodward has mentioned the points which occurred to him, in order that they may be given the careful consideration to which they are entitled.

REVIEWS OF PUBLICATIONS.

RALPH H. BLANCHARD,

BOOK REVIEW EDITOR.

Review of State Accident and Compensation Statistical Reports.

For a number of years the Committee on Statistics of the International Association of Industrial Accident Boards and Commissions has endeavored to promote the standardization of industrial accident and compensation statistics in the several States. With this end in view the committee has formulated standards in accident reporting, classification of industries and causes, and methods of presentation. Though every year finds the statistical reports of industrial commissions more accurate and reliable, there still exists much room for improvement. The primary weakness of State reports has been (1) the incompleteness and inadequacy of the data itself and (2) the diverse and slipshod methods of presentation.

No State commission has a record of all the industrial accidents occurring within the State. The nearest approach to complete reporting is perhaps found in California and Massachusetts. In most of the States only employers under the compensation act are required to report accidents. Some States require all accidents to be reported, some require only tabulatable accidents, and others require only compensable accidents. Again, in some States the published statistics include those accidents received during a given period, irrespective of the date of their occurrence; in some they include the accidents occurring within the period covered, irrespective of when they were reported; while in other States they include only cases which were closed or settled or adjudicated during the period, regardless of when the accident occurred or when the reports were received. Several States attempt to give the total compensation and medical costs incurred within the year, but most of the commissions, in so far as they give any data as to cost at all, give only the compensation losses paid during the year or the amount awarded on closed cases, and practically none gives the total medical costs either paid or incurred. So much for the data itself. As regards methods of presentation, the same chaos and

lack of uniformity exists. The various and varying classifications of industries and causes of accidents in the several States have made futile any attempt at comparison. As a consequence most of the State accident statistics have been neither reliable nor comparable. As a matter of fact, most of the industrial commissions, immersed in details of administrative and judicial procedure, have had little time for statistics. The increasing demand, however, for exact information as to the prevalence, cause and cost of industrial accidents in the United States has induced the commissions to devote more attention to statistical work.

The fact that the accident reporting provisions of the compensation acts in many States apply to all employers, whereas the compensation provisions do not, makes the compilation of complete and comparable accident statistics difficult. The California Commission in presenting cost data uses only compensable injuries, but in its cause and industry classifications all tabulatable injuries are included. Such a policy is recommended for all States in which the accident reporting and compensation provisions are not co-terminous.

In the following pages an analysis and evaluation of the accident statistics as published in a number of recent State compensation commission reports is attempted. In order to obtain a clearer conception of the adequacy or inadequacy of these statistics, there is also presented what may be considered the minimum requirements in the way of statistical presentation of accident and compensation data.

1. All accident statistics should be given by year of occurrence, preferably the calendar year—*i. e.*, the number, severity and cost of all accidents which occurred within a given period should be treated as a unit. This is essential if accurate comparisons are to be made. If the cases closed, adjudicated or reported within the year are taken as the unit, as they are in most States, it will impair the comparison of one year with another and will make it impossible to compute reliable accident rates.

2. The total annual number of industrial accidents in the State should be classified by extent of disability. By extent of disability is meant the number of deaths with and without dependents, the number of permanent totals, permanent partials, separated into dismemberments and loss of use, the number of temporary totals classified by period of disability.

3. The total incurred compensation and medical costs should be classified by extent of disability.

4. The annual number of accidents in each industry should be classified by extent of disability.

5. Accidents should be classified by cause and extent of disability.

The foregoing requirements may be regarded as the minimum. In addition, it is desirable that the medical and compensation costs for each industry be shown. It is also essential to show accident frequency and severity rates by industry in order to ascertain (1) the relative hazards in the various industries and (2) to show the trend of the hazard. In other words, it is extremely desirable to measure and evaluate the effect of workmen's compensation laws and the efficacy of safety work in preventing accidents.

To what extent the State accident reports measure up to the above requirements may be seen from the following analyses. The States taken range from Colorado, which has practically no accident statistics, to California and Nevada, whose statistical tabulations probably approximate more closely to the recommendations of the Committee on Statistics than any other States. Unfortunately two of the largest industrial States (New York and Ohio) have published no accident statistics whatever for the past five years.

Colorado.

The latest report of the Colorado Industrial Commission devotes 111 pages to workmen's compensation, but 88 of these pages are taken up with a description of the compensation awards which contains the claim number, the names of the parties in interest, the disability involved, and the amount of the award. As far as any practical statistical value is concerned, the whole 88 pages are useless. The report contains a single conglomerate table showing the total number of accidents received, the number of claims, awards, compensation agreements, types of injuries, average weekly wages, etc. There is no table showing the total number of accidents classified by extent of disability or the cost of such accidents, neither is there any table showing the classification of accidents by industry or cause.

Indiana.

The report of the Indiana Industrial Board contains numerous detailed tables classifying accidents by industry and cause, but

owing to the haphazard and unscientific character of the classifications practically no use can be made of these tables. The so-called industry classification embraces 273 separate classifications arranged in alphabetical order. No attempt has apparently been made to separate classifications into broad industrial groups, nor is it possible in many cases to determine whether the items refer to manufacturing, trade, or personal service. Industries and occupations are run together helter-skelter—*e.g.*, the industry classification includes aeroplanes, dentists and dental supplies, dairy products, physicians, fire-proof articles, hardware, newspapers, and musical instruments. It is impossible to know whether the items “aeroplanes” or “musical instruments” mean their manufacture, sale or operation. Furthermore, in a large number of classifications (*e.g.*, boots and shoes and lumber) manufacturing and dealers are combined in a single classification. Again, many synonymous industries, such as “iron and steel” and “steel and wire,” “newspapers,” and “printing and publishing,” are given separate classifications.

The cause classification table is also hopeless. This table is divided into ten main classifications, which represent the manner of occurrence rather than the cause. The item “belts” is found seven times, but no total for belts is given, nor does the table contain any subtotals for each of the main classifications.

The report also contains tables showing classifications of accidents by nature and location of injury, wage and age, but no totals are given in any of these tables. In order to obtain the number of fractures, for example, one must add up all the individual items.

Another table shows the duration of disability by days, but in over 50 percent of these accidents the period of disability is not given. This is due to the fact that the accident report is coded and punched when received, and if the disability has not terminated when the report is received the disability period is not punched. This practically means that only the short-term disability accidents are included in the classified table, and the results consequently are not only inaccurate, but absolutely misleading. Another item in the table which is quite meaningless states that 223 “quit work at time of injury.”

Both the industry and cause classifications give merely the total number of accidents for each classification. All the tables show distribution of accidents by months—a detail that is unnecessary.

The report contains no table showing the total number of accidents classified by extent of disability, nor does it contain any data as to incurred compensation and medical costs. It does show, however, the amount paid out on closed cases during the year.

Washington.

The latest report of the Washington Industrial Commission contains numerous tables showing costs and classification of accidents by industry and cause. Three financial statements are given, one each for the reserve fund, accident fund and medical-aid fund. In each statement the experience by industrial classes is given. The reserve fund shows the amount of compensation paid and reserves set up for each class, while the accident fund shows the amount of claims paid and premiums received during the year. The medical-aid fund, showing the amount of medical benefits paid and medical premiums received, is kept separate from the compensation fund. None of these tables show the amount of earned premium or incurred losses for any given period. They merely show the number of premiums *collected* and compensation losses paid during the year.

Another series of tables shows a number of accidents and the amount of compensation incurred, classified by nature and location of injury, but the tables do not show what period is covered.

Another table classifies the total accidents by cause and industry. There is no particular value in such a classification, especially if the accidents are not classified by extent of disability.

A further table shows the wage loss by industry. There is nothing to show, however, whether or not the waiting period has been included or whether the wage loss given covers temporary total accidents only or also includes permanent partials; nor is the amount of compensation given in order that this might be compared with the wage loss.

The best table in the report shows the cost and severity of injuries by cause. This table is in two parts; part one dealing with injuries due to mechanical causes and part two dealing with injuries due to non-mechanical causes.

The Washington report is deficient in that it does not contain the following information:

(1) The total number of accidents occurring during the year classified by severity. (2) The incurred losses during the year for each

industry. Only the amount paid out and reserves set up on claims adjudicated during the year is given. (3) The earned premiums during the year for each industry. Only the premiums collected during the year irrespective of the period for which they were earned are given. It is impossible, therefore, to correlate the earned premiums with the incurred losses. (4) Classifications of accidents by cause and severity. (5) Inadequate headings or captions to the several tables to denote just what accidents are included and what period is covered.

Oregon.

The accident and compensation statistics contained in the latest report of the Oregon Industrial Commission are exemplary from the standpoint of method, but deficient from the standpoint of data included. A basic compensation table shows for each industrial classification the payroll, total number of days worked, premiums received, premium rate, claims paid and awarded, administrative expenses, pure premium per \$100 payroll and pure premium per work day. The table is deficient in that it does not show the earned premiums or the incurred losses for a given period. It merely shows the premiums collected and the compensation losses awarded and paid during the year. As in the case of Washington, it is impossible, therefore, to correlate earned premiums with incurred losses.

The report contains a number of accident tables showing the classification of accidents by cause and extent of disability. All of these classifications, however, are based upon cases closed during the year, and not upon the accidents happening during the year. It is impossible accurately to compare one year with another. In one respect the Oregon Commission is to be particularly commended. It is one of two States (Nevada being the other) which has computed accident frequency and severity rates for each industry classification. Unfortunately, however, these rates are based upon closed cases and consequently it is impossible to compare one year with another. Other tables show the compensation and medical costs by extent of disability, duration of temporary total disability in permanent partial disability cases, causes of accidents by extent of disability, and remarriage of widows.

Wisconsin.

The accident and compensation statistics published by the Industrial Commission of Wisconsin, as in the case of Oregon, are excellent as regards the form and method of presentation, but are criticisable on the ground that they are based upon closed cases rather than upon the accidents occurring within a given period. Moreover, in Wisconsin only compensable accidents (over 7 days) are reported, the commission having no record of non-compensable accidents. In this respect Wisconsin differs from all of the other States here considered.

The basic compensation table shows the distribution of accidents by extent of disability and the compensation and medical costs for each type of injury. The medical cost, however, does not include the cost of non-compensable accidents. As already noted, this data, as well as the tables which follow, are based upon closed cases. Other tables published by the commission include the following: Classification of accidents by cause and extent of disability; classification of accidents by industry and extent of disability; classification of permanent disabilities, not dismemberments, by degree of disability, showing the number and amount of compensation and medical aid paid in each case; number of dependents in fatal cases and wages.

Nevada.

The Nevada Industrial Commission has been one of the first to publish accurate and usable accident and compensation statistics. It was the first State to undertake the computation of accident rates by industry. The basic compensation table shows for each industrial class and subclass the number of full-time workers, payroll, earned premiums, incurred compensation losses in the case of death, permanent disability and temporary disability, the average compensation incurred per case and the pure premium per \$100 of payroll. This table, however, does not show the medical cost, that being presented in another table, because of the provision in the law which created a separate medical-aid fund. Other tables show the accident frequency and severity rates by industry. These rates are stated both in terms of full-time workers and payroll. The Nevada Commission has published no classification of accidents by cause.

Massachusetts.

The Massachusetts Industrial Accident Board is one of the few compensation commissions which from the beginning have given serious consideration to the question of accident statistics. While some of the statistical tables and classifications in the earlier reports are subject to criticism, the latest report follows closely the recommendations of the Committee on Statistics. The board itself compiles no data as to compensation costs. It does, however, publish an annual statement, based upon returns made by insurance companies to the board, showing the amount of compensation and medical losses paid and outstanding on injuries reported during the fiscal year.

All employers in Massachusetts, whether under the compensation act or not, must report all accidents to the Industrial Accident Board. The various tables showing classification of injuries by industry, cause, etc., therefore include all tabulatable accidents reported, and are not limited to those under the compensation act. The following accident tables and classifications are given in the report: Number of accidents classified by industry and extent of disability; number of days lost on account of accidents classified by industry and extent of disability; classification of accidents by location and nature of injury; classification by location, nature and extent of disability; classification by cause and extent of disability; sex and age classified by type of injury; wage by industry; and conjugal condition and dependency in fatal cases classified by industry.

An improvement might be made by combining the two tables showing the number of accidents and number of days for each industry. This can easily be accomplished by combining in one column the deaths and permanent totals and curtailing the number of temporary total groups. The present tables show for each industry the number of temporary total disabilities of 1 to 3 days, 4 to 7 days, 8 to 10 days, 11 to 14 days, 2 to 4 weeks, 4 to 8, 8 to 13, 13 to 26, 26 to 52 weeks, and over 1 year. It would seem sufficient, as recommended by the Committee on Statistics, to reduce these 10 groups to 3, as follows: 1 week and under, over 1 to 2 weeks, and over 2 weeks. No particular value is gained by showing for each industry such minute distribution of temporary disabilities. On the other hand, it would be desirable to show the distribution of

temporary totals, *as a whole*, by days up to 14 days and then by weeks up to 26 weeks. It is to be hoped that the Massachusetts board will find it possible also to ascertain the number of employees in each industry in order that accurate accident frequency and severity rates may be computed.

California.

The California Industrial Accident Commission, in its latest report, follows the recommendations of the Committee on Statistics as regards the classifications and tabulations of accidents more closely perhaps than any other State. Two tables as to compensation costs are given. One shows the amount of compensation incurred on account of compensable injuries occurring during the calendar year classified by extent of disability. The other shows for each insurance carrier the amount of incurred compensation on account of compensable injuries by extent of disability. Neither table, however, shows medical losses. In fact, this data is not shown anywhere in the report. In the tables showing classification of injuries by industry and cause all *tabulatable* accidents are used. The tabulations include the following: Classification of accidents by industry and extent of disability; classification by cause and extent of disability; classification by location and nature of injury; permanent partials classified by degree of disability and temporary totals by day and week periods; fatal cases classified by age and dependency. Frequency and severity rates are not given. A particularly commendable feature of the California report is the inclusion of explanatory notes which show what data is included in the tables and the period covered.

An examination of the accident and compensation statistics in the foregoing State reports shows the greatest needs to be the following:

1. Adequate headings or explanatory notes which should show just what is included in the various statistical tables and what period they cover.
2. In the presentation of accident and compensation statistics the unit should be the year of occurrence—*i.e.*, all the accidents which occurred within a given period, irrespective of the date of reporting or adjudication, should be treated as a unit. In no other way can accurate comparison be made of one year's experi-

ence with another. If necessary the disability period or outstanding losses in open cases should be estimated.

3. In presenting compensation costs the total incurred losses (paid and outstanding) should be given. Merely to show the amount paid out during or for a given period is of little practical value and, in addition, is likely to be misleading. Showing compensation costs of closed cases only prevents accurate comparison of one year with another. Compensation and medical losses should be shown separately.

4. In presenting compensation costs only compensable accidents should be used, but in other tabulations all tabulatable accidents should be included.

5. A distribution table by extent of disability should be given of all accidents occurring within the year.

6. In tabulating accidents by industry and cause it is essential that they should be classified by extent of disability—*i.e.*, the number of deaths, permanent partials, temporary totals, etc., for each industry or cause should be given. Merely to show the total number of accidents occurring in each industry without taking into account the question of severity is misleading and of little value.

7. The standard classifications and tables formulated by the Committee on Statistics of the International Association of Industrial Accident Boards and Commissions should be followed. The reports of the Committee on Statistics containing these tables and classifications may be found in Bulletin 276 of the United States Bureau of Labor Statistics, copy of which may be had upon request.

CARL HOOKSTADT.

Public Health and Insurance: American Addresses. Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Johns Hopkins Press, Baltimore, 1920. Pp. 270.

Dr. Newsholme's book will be of service to American insurance students in two important respects: First, there is a lucid description of the actual working of the British National Health Insurance Act, an impartial statement of both favorable and unfavorable aspects of this piece of experimental legislation; second, it invites these students, whether they be actuaries interested primarily in rate-making problems, statisticians, sociologists and publicists concerned with the social functions of insurance, administrators en-

gaged in the financial and underwriting departments of the business, or specialists in insurance medicine, to examine critically any similar plan offered in America and to see that health insurance does not impede the development of public health work and the orderly progress of medicine, nursing and the allied arts and sciences devoted to the prevention of sickness, the relief of suffering and to the prolongation of human life.

Dr. Newsholme's lectures are a plea for a catholicity in point of view which will restrain the enthusiasm of narrow professionalism in handling the health insurance problem in America. If the several groups of insurance specialists who have approached health insurance discussions in this country in recent years master thoroughly the substance of Sir Arthur's American addresses, there will be a greater tolerance by any one group toward the others. It will then be seen that the sociologists and actuaries advocating health insurance measures must understand and cooperate with the statisticians, the publicists, the public health administrators and the medical profession. Public health workers have, through long experience, learned that a special problem may be solved only by considering all the facts and bearings of that problem; the administrative procedure for the suppression of any disease must take into account the special facts of the natural history and characteristics of that disease. Health insurance can not be established simply by constructing a manual of rates and by establishing administrative and underwriting machinery as in life insurance or in personal health and accident insurance. It has special social, political, medical and psychological aspects which must be evaluated by the statistician or student of social policy before any program worthy of legislative action can be prepared. Regarding the serious hazard of ignoring, for one thing, the aims and purposes of public health work and of medicine, Dr. Newsholme says:

Insurance against sickness is a praiseworthy and valuable provision against future contingencies; and on its non-medical side free from drawbacks. Neither on its medical nor on its non-medical side, however, is it an alternative to prevention of disease; and the National Insurance Act in England must be held in the main to have delayed the public health reform which would have been secured had equal effort been devoted to it, and the money lavished on insurance given in the form of central public health grants conditional on the active cooperation of local authorities (pages 33, 34).

Dr. Newsholme then details critically the provisions for sana-

torium and maternity benefits and emphasizes the disparity between the promises in the act for medical treatment and the results actually achieved. The chapter on "Medical Aspects of Insurance Against Sickness," pages 103-119, will repay thoughtful reading. It contains the details of Dr. Newsholme's indictment against the provisions for medical benefits under the act. How health insurance provision for only part of the tuberculous wage-earning population may seriously impair a comprehensive national program for hospitalization and prevention of the disease is clearly set forth on page 223:

Soon after the passing of the National Insurance Act in 1911 representations were made that tuberculosis affected non-insured as well as insured; that treatment of insured could have only partial success so long as non-insured members of the same household were neglected; and that this was work for public-health authorities which they were partially undertaking. It was evident that the inextricably interlaced measures for the prevention and the treatment of tuberculosis must accrue to the whole population; and the mistake of the National Insurance Act was remedied to the extent that public-health authorities were informed that the National Treasury was prepared to pay one-half of the approved expenditure incurred by these authorities in establishing schemes for the treatment of tuberculosis available for the entire population. Such schemes were proceeded with . . . but influences other than medical led to the unsatisfactory use of institutional treatment. A large number of patients were sent to and retained in sanatoria for prolonged periods, who might have been adequately treated at home, or who should have been in hospitals . . . and there will probably be no material improvement until the Sanatorium Benefit is withdrawn under the National Insurance Act, and the treatment of tuberculosis becomes an obligatory duty of public-health authorities, with a minimum standard of provision to which all must attain.

Thus in this particular alone a health insurance program modeled on lines of the British National Insurance Act may impair the working of one important arm of modern public health work. There is no space in which to detail Dr. Newsholme's temperate judgments on the Maternity and Medical Benefit provisions of the act.

In closing this review it may be said that since the actuaries, statisticians and publicists in our Society may be called upon to participate in discussions of health insurance from time to time, they should make themselves acquainted with the general aims and purposes of public health work and of the practice of medicine, in order that they may advise only measures which will not impair

the effective existing and proposed social efforts for the advancement of human welfare. In Dr. Newsholme's words, we should advise against that "moral contagiousness under modern conditions of life, of a new course adopted in any country. Bismarck's attempt to counteract socialism by insurance has been responsible for state and official experimentation in insurance in many countries, which at least in England, was not actuarially, financially or medically sound, and which has involved expenditure in administration entirely incommensurate with the benefits received."

E. W. KOPF.

The Law of Workmen's Compensation. Samuel A. Harper. Callaghan & Company, Chicago, 1919. Pp. xx, 697.

Several textbooks have been published in this country concerning the law of workmen's compensation, each aiming to cover the subject generally. The author of this book has made an exhaustive study of decisions in every State, but it is a question whether his book can be regarded as one covering all the compensation laws in the United States. However, he has written a valuable textbook covering the compensation law of the State of Illinois, enriching his text by quoting decisions from other State tribunals. Throughout the book the various sections of the Illinois Compensation Law are quoted verbatim and in connection with each section decisions in the Illinois courts and other jurisdictions are quoted. If the book were a general text, there would have been no need to quote the Illinois law so frequently and at such length. On the contrary, it should have been avoided; but so many difficulties exist at the present time that the author, who is a member of the Chicago bar, probably was obliged to use this law as the basis for his text. An analysis of the various State compensation laws and decisions will demonstrate the fact that each State law involves a separate study. This branch of the law is so new in the United States that uniformity can not be expected. As time passes the good features in the different acts will be collected, which will make possible the passage of uniform legislation. When that time arrives the writing of a general text will not only be easier, but more helpful than at present.

A reading of Chapter III will demonstrate the impossibility of producing a general text covering the entire country. There is a

discussion in this chapter of hazardous industries that produce compensable accidents. The author ably analyzes various decisions indicating that the courts have been very strict in interpreting hazardous occupations as defined by the law. But this topic, like a number of others, is becoming a matter of historical rather than practical interest. The statutes in many States are growing more liberal, not only covering industries that are hazardous, but many which are usually considered non-hazardous.

The book contains an interesting discussion of the State and the municipality as an employer under workmen's compensation laws. Advocates of compensation laws in this country originally asserted that the laws were desired to protect employees in hazardous industries carried on for profit. As the State and its subdivisions are not supposed to make profits, their employees were usually not covered. Where they were covered, decisions in the courts were conflicting. Again we have a matter that is only of historical importance as the present tendency is for the legislature to grant the benefits of the compensation law to all State and municipal employees.

There are several portions of the book which are very helpful to a proper understanding of this branch of the law. The principles underlying the problems of constitutionality, maritime risks and interstate risks are illustrated by the latest decisions. The author's discussion of when an employee is injured in the "scope of employment" should enable a lawyer or claim agent to handle intelligently the compensability of doubtful cases falling within that category.

While two chapters are devoted to existing insurance systems and direct liability of insurance carriers, the author missed a good opportunity in failing to base these chapters on the Universal Standard Policy Form. This policy form has been in use in practically every State. If the decisions rendered in the various jurisdictions (in connection with that form) had been collected, without doubt any weakness would have been discovered and would have offered an excellent basis for improvements.

Attention must be called to page 477, where the statement is made that "in the absence of waiver or estoppel, the insurance company is not liable for an accident to a minor illegally employed if the policy covers only employees legally employed." It would be interesting to read an insurance policy specifically covering employees legally and illegally employed. Incidentally, in New York

State the court has held, in the case of an injured employee, a child of fourteen, illegally employed, that the insurance carrier was not exempted from liability.

In addition to analyzing various compensation decisions in the courts, forms used by the Illinois Industrial Commission and a number of present value tables are included at the end of the volume.

The author should be commended for his collection of leading cases that have been decided since the introduction of workmen's compensation in the United States. His work must not merely be regarded as a reference book, but should stimulate further investigations of the principles underlying this branch of the law.

S. B. ACKERMAN.

Journal. The Incorporated Australian Insurance Institute. Annual. Melbourne, Australia.

The Society has for review the first volume of the *Journal* published by the Incorporated Australian Insurance Institute, which was organized in August, 1919. The Institute, which seems to correspond rather closely to the Insurance Institute of America, at present represents a national federation of the Insurance Institutes of New South Wales, Victoria, South Australia and Western Australia. Provision is made, however, for new members, and there is reference in the address of one of the officials, which is reproduced in the *Journal*, to the possibility of the addition of the local Institutes of Queensland and New Zealand.

The objects of the Institute, as set forth in the Memorandum of Association, are as follows:

- “ A. To provide and maintain a central organization for the promotion of efficiency, progress, and general development among persons employed in Insurance business, whether Members of the Institute or not, with a view not only to their own advantage, but to rendering the conduct of such business more effective, safe and scientific, and securing and justifying the confidence of the public and employers by reliable tests and assurances of the confidence and trustworthiness of persons engaged in such business.
- “ B. To encourage and assist in the study of any subjects bearing on any branch of Insurance.
- “ C. To publish a *Journal* and any other matter deemed desirable by the Council of the Institute.
- “ D. To form a library or libraries for the use of the Members of the Institute.

- “ *E.* To offer money or other prizes for essays or research on any subject bearing on Insurance.
- “ *F.* To devise and impose means for testing the qualifications of candidates for the certificates of the Institute by examination in theory and practice, or by any other actual and practical tests and to grant certificates of qualification to the successful candidates.
- “ *G.* To promote personal and friendly intercourse between Members of the Institute, to hold conferences and meetings for the discussion of professional affairs, interests and duties, the reading of papers, and the delivery of lectures; to compile lists, registers, and records of events and proceedings of interest to the Members; to issue copies of such lists, registers and records from time to time to Members of the Institute, and generally to collect, collate, and publish statistical or other information of service or interest to members of the profession.
- “ *H.* To ascertain the law and practice relating to all things connected with Insurance, to collect and form a strong body of executive opinion, with the view of obtaining the codification and amendment of the Acts relating to Insurance Companies and to watch any legislation affecting the same.
- “ *I.* To exercise professional supervision and control over the Members of the Institute, to safeguard their interests and welfare, to further their advancement, and to promote whatever may lead to the improvement of the status of Insurance officials in general and the Members of the Institute in particular.
- “ *J.* To act as a means of communication between Members and others seeking engagements in Insurance Offices, and employers desirous of employing them.
- “ *K.* To assist necessitous Members and the widows and children and relatives of deceased members, and to act as treasurer and distributor of any benevolent fund or funds which may be contributed by Members or others, and to make any contribution to any such fund or funds out of the income or assets of the Institute.
- “ *L.* To purchase, rent, lease, hold and dispose of any building or buildings to be used as a place of meeting for the Members of the Institute, or as a college, lecture or reading rooms for library, or for social purposes, or any other property, real or personal, for the advancement of the above objects or any of them.
- “ *M.* To promote and encourage provision by the Members against the contingencies of age, sickness, misfortune and death, and to assist financially or otherwise, toward such provision.
- “ *N.* To do all such other lawful things as are incidental to or conducive to the attainment of the above objects or any of them.”

It will be noted that this list of objects embraces considerably more functions than are assumed by any of the insurance organizations of this country. It is quite obvious that this extensive pro-

gram could not be put into practice at the outset. In fact, it is stated in the *Journal* that the first work attempted was limited entirely to the holding of examinations, although reference is made to two items on the agenda of the first annual conference held at Melbourne on March 24, 1920, which have to do with the establishment of an orphanage or benevolent fund and a scheme of prizes for persons passing examinations with high honor.

The membership of the Institute consists of several classes of members: Members, Honorary Members and Corresponding Members. Members are all persons who belong to the local insurance Institutes approved by the Council. At the start certain individuals were elected as Foundation Fellows and Associates, thus creating a nucleus for the organization. At the present time it is provided, however, that, subject to a few exceptions, election to Fellowship or Associateship can take place only as a result of examination. Honorary Members (Fellows and Associates) are nominated by the member Institutes and are subject to election by the annual conference on recommendation of the Council. Corresponding Members are persons who are temporarily non-resident, but who because of their interest in insurance and in the work of the Institute wish to retain their affiliation.

A large part of the *Journal* is devoted to a description of the examination system, which is worthy of comment. Examinations are offered in four branches as follows: Fire, Life, Accident, Marine. Every candidate, unless he can present a proper certificate indicating that he has received a substantial education in another manner, must take Part I, which is the same for all branches and which embraces the following subjects:

- a. French
- b. History
- c. English
- d. Mathematics
- e. Geography

The candidate who passes this part of the examinations, or is permitted to waive it, is next admitted to examination in any one of the branches which he may select. Examinations in each branch are in two parts. Associateship is the reward of candidates who are successful in the examinations in the elected branch. Fellowship may then be obtained upon writing a thesis.

The examinations which correspond most closely to those of our Society are given in the accident branch. It is quite apparent that specialization in casualty insurance technique is not nearly so highly developed in Australia as in this country. The following list of subjects is reproduced for those who will be interested to compare the scope of our examinations with those of the Institute:

Part II:

- a. Elementary human physiology—the general structure of the Body; the form and relative position of the parts of the Skeleton, and Organs; the Nervous and Muscular Systems.
- b. Workmen's compensation insurance, including law (elementary); Workmen's Compensation Practice, including Policy Forms, Conditions, and Endorsements; General Principles of the Workmen's Compensation Acts.
- c. 1. Personal Accident, Disease and Sickness Insurance.
2. Livestock Insurance.
Both including policy forms, conditions and endorsements.
- d. Public liability and motor insurance—practice, including law (elementary) in regard thereto; Policy Forms, Conditions and Endorsements.
- e. Fidelity guaranty (including bonds), burglary, glass and boiler insurance, including Policy Forms, Conditions and Endorsements.

Part III:

- a. Correspondence—good composition and tactful phraseology, and a general knowledge regarding the practice of accident insurance in all its branches.
- b. Claims in all sections of accident business (and their settlement).
- c. Physiology, anatomy—fractures, strains and diseases, and the probable period of disability consequent thereof; medical terms and their meanings; industrial diseases.
- d. Law—the relationship between employer and employee under the following Acts:
Fatal Accidents Act,
Employers' Liability Act,
Workmen's Compensation Act, and
Common Law.
- e. Law—the liability imposed by the Common Law upon persons to pay damages to others who are injured or whose property is damaged by the acts or omission of the former or their servants or agents.
- f. Accounts and investments.

A thorough examination is given in each of these subjects, papers being required to be written on each. In the examinations which are reproduced in the *Journal* the student is allowed 2½ hours for each paper of ten questions.

Technical papers, a number of which are reproduced in the

Journal, are first read before the local Institutes and are selected for publication by a central committee. In the present volume the following papers are presented:

“Paper Manufacturing”—An analysis of the paper manufacturing industry, particularly with reference to fire insurance.

“Boot Factories and Their Hazards”—A similar analysis of the boot and shoe manufacturing industry, also from the standpoint of fire hazards.

“Insurance of Workers Against Sickness, Unemployment, Old Age and Death”—An analysis of social insurance schemes in other countries, with deductions drawn therefrom as applicable to the Australian situation.

“The Goods Policy”—An historical analysis of this marine insurance policy form, particularly with reference to Australian practice.

Taken by and large, the *Journal* is an attractive publication, containing much of interest and value to persons engaged in the insurance business. Improvements will be made, no doubt, as time passes and the Institute extends its activities to the several fields covered by its statement of objects. The present volume, however, is a step in the right direction and as such it sets a high standard for future accomplishment.

G. F. MICHELbacher.

Readings and Problems in Statistical Methods. Horace Secrist. Macmillan Company, New York, 1920. Pp. xxi, 482.

The motives which prompted the publication of this book were apparently two: to supplement the discussion of principles in available texts and to offer suggestions for the development of laboratory exercises. The first motive is predominant in the author's mind and is reflected in his treatment. The book is intended as a companion volume to his “Introduction to Statistical Methods” and the selections of readings are grouped under topical headings to correspond to chapters in his text.

A companion volume of readings of this sort might include only examples or applications of the principles discussed in the text, or it might be a restatement or further discussion of principles. The former would be the preferable procedure if the texts available for elementary teaching were satisfactory for the purpose. But statisti-

tics has been for too short a time an important field of study in university curricula in the United States for the *final* text to have been written. Such statement in no way detracts from the efforts of Secrist or of others to supply this need. The English texts by Bowley and Yule are too difficult for our elementary classes and are not altogether suited to American conditions. The result has been, at least in the reviewer's experience, that the discussion of principles in the texts must be supplemented by articles from various statistical or other periodicals. A case in point is tabulation. Neither Secrist's text nor Bowley's "Elements" nor Bowley's "Manual" cover in as satisfactory way the construction of statistical tables as the article by Day in the March, 1920, *Statistical Quarterly*. Watkins' articles on "The Theory of Statistical Tabulation" in the *Statistical Quarterly* and on "Statistical Units" in the *Quarterly Journal of Economics* both contain discussions of principles which will greatly assist the beginner. The inclusion, therefore, of well-selected discussions of principles, as well as illustrative examples and applications of principles, has added considerably to the value of the "Readings" for at least one of its users.

The title of the book, "Readings and Problems," indicates, as stated above, the twofold motive for its publication. The introduction states that the review problems have been included because of the demand from instructors in statistics for laboratory problems; but the author protests vigorously against "make-work" problems and insists that problems should be chosen by each instructor from his own experience and with a view to arousing the intellectual interests of the students. With the need of the latter there can be no disagreement, but the extent to which the author has subordinated this phase of his book is disappointing. The teaching of statistics has in recent years tended more and more to follow the method common to physical and biological sciences—a combination of classroom discussion of principles with laboratory demonstrations and analyses. The substantial body of principles and fairly standardized methods of procedure now comprehended within the subject *statistics* has made this a possible, even a necessary, development. It is probably a safe prediction that another generation will see the regular use of laboratory manuals in statistics as in chemistry or physics. This does not mean that the teachers of statistics, or the specialists in the field, will become slaves to a manual; but a well-

prepared laboratory manual will be a great aid to the better quality of teaching and a great assistance to students. The subject is being taught in many colleges and universities by men who are not specialists in statistics, who devote a major part of their time to other fields. It is for these in particular that a manual has its chief use. The quality of the instruction which they give will depend in large part upon the character of the texts available, and a good laboratory manual will be an important factor in their success. This is not so much a protest against "Readings and Problems" as an expressed hope that some one will write the necessary manual.

An indication of the scant consideration which the author avowedly gives to laboratory problems is the fact that they occupy exactly 24 out of 420 pages in the book. Twelve of the twenty-four are devoted to graphic method and afford a good illustration of the way in which problems may be used to develop the technique and the critical faculty so necessary in statistical work.

BRUCE D. MUDGETT.