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

## PROCEDURE IN THE EXAMINATION OF CASUALTY COMPANIES — EMMA C. MAYCRINK VOLUME XVIII, PAGE 81

### WRITTEN DISCUSSION

MR. HARTWELL L. HALL:

Miss Maycrink has dealt with her topic both ably and completely and my comments, therefore, consist only of supplementary remarks and observations. Near the beginning of this paper, she spoke of the anomaly presented in the blank wherein casualty companies show the premiums as written and the disbursements and other income on a cash basis. When and if casualty companies adopt a cash basis of premium reporting, losses due to the evil of free insurance and other factors would be minimized. A much clearer financial statement would result from cash reporting and there would appear to be some reduction in expenses due to the simplification of records.

While the examiner does not need to be suspicious of the various entries he finds, yet he should at all times maintain a critical attitude in all his work. In a broad sense, the examination consists of inventorying and valuation. The assets should not be overvalued and the liabilities should not be undervalued. In Connecticut, we allow the amortization of bonds for fire and casualty companies as in life companies. Values are not very difficult to obtain for practically all assets except the heterogeneous ones which are found under the title, "expected recoveries on depository losses," "advances on contracts," "salvage recoverable," etc. These are found in the reports of some companies doing fidelity and surety business. Due to the fact that letters which give conservative estimates may be obtained from the Treasury Department in regard to expected recoveries on national banks and from receivers on other banks, the first mentioned account, "expected recoveries on depository losses," probably has considerable merit. Most of the other types of salvage assets are both slow moving and indeterminate and, because of

these and other facts, our department would much prefer to see such items relegated to Schedule X. A company which takes any sizeable credit for such items incurs the suspicion that it was necessary to do so in order to make a favorable statement.

Turning to the liabilities, the loss reserve is the most important account. We find that we follow the methods mentioned in this paper quite closely. As stated, our review follows some time after the date of the statement and considerable accuracy can be obtained, especially in certain lines where the run-off is of short duration. We use the company's Hollerith cards to obtain the listing as of the date of the statement. Then we follow this by a run-off of the paid cards on these cases and also the incurred but unreported cases up to the time of the examination. A list of the claims still open is then made with the latest estimate available. Such cases in a large company should be test checked with the claim files, the best source of available information. In smaller companies or in cases of special examinations, all the files may be reviewed. For example, in a company which was examined as of December 31, 1928, the paid cards for the first six months of 1929 were available on the accident and health lines and were sorted into three groups:

1. The disability date 1928 or prior, notice received in 1928.
2. The disability date 1928 or prior, notice received in 1929.
3. The disability date 1929, notice received in 1929.

The total for the first group furnished the paid data for the "adjusted or in process" column. The second group furnished the "incurred but not reported" paid data. The third group material is only used in order that the grand total of all the groups may be checked with the disbursement accounts for these lines. Then, of course, the estimates of the still outstanding cases are added to the figures obtained. The reserves for cases payable throughout life were based on tabular reserves. This statement is given merely to show what results may be accomplished by the use of the Hollerith cards. This method could be used for all lines where the losses are soon known. The fidelity and surety claims have to be established from the information in the files.

In all the other lines where a large part of the liability is deferred, the company's reserves must be test checked quite

thoroughly. It is necessary to review a large number of claim files. In order to be satisfied with the company's reserves, it may be necessary to check up a list six months or one year old and find out what has been the run-off on these cases, together with the latest reserve on the cases still open. A schedule on this basis for a five-year period similar to Schedule G has been recommended by the Report of Committee on Compensation and Liability Loss Reserves of this Society.

In checking the unearned premium reserve, care should be taken to see that all portfolio insurance accepted is carried at the reserve which would have been carried by the original company had it retained the risks. Otherwise, a company which puts up only 50 per cent. of its premiums as a reserve could add a substantial amount to surplus unjustifiably by taking over a portfolio of insurance at the year-end.

An outline of procedure followed in examination of insurance companies was included in a paper entitled "Examination of Insurance Companies" presented before the National Convention of Insurance Commissioners by Howard P. Dunham, Insurance Commissioner of Connecticut, at the September, 1931, meeting of that organization. With slight changes, this procedure was adopted by the National Convention of Insurance Commissioners and can be found in the *Proceedings* of that body.

MR. WILLIAM M. CORCORAN:

Miss Maycrink has treated this subject so accurately and completely that little further discussion seems to be necessary. The author states, however, that other features in the examination of insurance companies might be enumerated indefinitely and I have jotted down for discussion a few minor points that often arise in connection with insurance department examinations.

In the examination of some companies, the cash in office item, as reported in the company's statement, cannot be verified by an actual count of the cash on the date following that which is to be the date of the examination report. The reason for this is that many companies now keep their books open several days beyond the date of the statement and enter the cash received for overdue premiums during this period as of the last date of

the accounting period. These late remittances must, of course, be shown as cash in office in the statement. I believe it is now the practice of several insurance departments to permit these items to be treated as cash in office if the company retains evidence to show that remittances were actually mailed prior to the end of the statement period.

The insurance departments quite naturally prefer to have companies take no credit for salvage items until they have been converted into cash. At the present time, however, salvage items of many companies total such a substantial amount that the companies quite naturally and quite reasonably desire to obtain credit for these items before they are converted into cash. I think that most insurance departments now allow companies to carry salvage assets at values which can be clearly substantiated. Due to the antipathy of many departments toward the title "salvage assets," these items are often distributed in the assets as "real estate," "mortgage loans," "bonds" and "stocks" and, in the case of advances, many times as "collateral loans." The examiners should carefully investigate the value of all assets received as salvage. One important point is to make sure that the company takes credit only for its net equity in any salvage and does not include any equities which belong to reinsurers. It is very easy for a company to take credit for gross salvage on a loss which is reinsured, for the reason that in many companies a separate salvage department is maintained which concerns itself purely with the collection of salvage and only to a slight extent with reinsurance arrangements, these being handled usually by the accounting or claim department. Sometimes the company secures its salvage estimates from the salvage department and neglects to give proper consideration to reinsurance. This is particularly important in the case of losses which have resulted in the payment of reinsurance under excess treaties. In such cases, the reinsurer is usually entitled to all salvage until its loss has been completely repaid.

The liability for unpaid commissions is usually estimated by applying the ratios developed from the company's experience to the outstanding premiums under 90 days due. Some companies now have excess reinsurance treaties providing for the payment of a flat premium with no commission. If outstanding reinsur-

ance premiums due have been deducted from the outstanding premiums, this fact should be taken into consideration in estimating the commission liability.

Miss Maycrink states that the majority of examinations are as of the last day of the year. This has quite generally been true in the past, inasmuch as a considerable lapse of time between the date of the examination and the actual work of the examination has given the examiners the benefit of a large amount of subsequent experience in estimating the loss reserve. At the present time, however, most departments feel that it is most important to make the examination date just as short a period as possible before the work is actually begun; in other words, to bring the examination up to the latest date possible. The accounting and statistical facilities of most of the companies at the present time make it possible for an examiner to make up his statement as of almost any date in the year with equal facility.

MR. JOHN EDWARDS:

Miss Maycrink's paper is very well written and clearly shows the present-day tendency of insurance departments generally to cooperate with the companies in the dissemination of knowledge.

The procedure in Canada regarding the examination of licensed insurers is largely the same except for the differences in the construction of the annual statement blanks and the various laws affecting such insurers.

Insurance supervision is a much older institution in the United States than it is in Canada, although a number of companies were separately incorporated before supervision was considered. The Halifax Fire Insurance Company was originally organized in 1809 and the British America Assurance Company was incorporated by an Act of Legislature of the Province of Upper Canada February 13, 1833, and commenced business the same year.

At the twelfth Parliament of Upper Canada in the 6th year of William IV an Act was passed April 20, 1836 entitled "An Act to authorize the establishment of Mutual Insurance Companies in the several Districts of this Province." This Act is quoted in part as follows:

> "Whereas divers loyal subjects of His Majesty being inhabitants of this Province, have by their petition repre-

> sented the great advantages that would arise from the introduction into this Province of the principle of Mutual Insurance against losses by fire, and have prayed the interference of the Legislature to enable them to bring the said principle into effective operation: And whereas it hath been made apparent that the said representation is well founded, and it is expedient that the prayer of the petitioners be granted: Be it therefore enacted by the King's most Excellent Majesty, by and with the advice and consent of the Legislative Council and Assembly of the Province of Upper Canada, constituted and assembled by virtue of and under the authority of an Act passed in the Parliament of Great Britain, entitled, 'An Act to repeal certain parts of an Act passed in the fourteenth year of His Majesty's reign entitled, "An Act for making more effectual provision for the Government of the Province of Quebec, in North America," and to make further provision for the Government of the said Province,' and by the authority of the same, That it shall and may be lawful at any time for any ten freeholders in any district in this Province to call a meeting of the freeholders of such District, for the purpose of considering whether it be expedient to establish in such District a Fire Insurance Company on the principle of Mutual Insurance."

The British North America Act, 1867, provided for the union of the provinces of Canada, Nova Scotia and New Brunswick. Provision was made in this Act for the distribution of legislative powers as between the Parliament of Canada and the Provincial legislatures. In 1868, the first Parliament of Canada passed an Act respecting insurance companies which provided, among other things, that no insurance company other than a purely provincial company, could carry on business in Canada without receiving a license from the Minister of Finance unless transacting exclusively ocean marine insurance. The issue of the license was contingent upon the filing of a deposit. The Dominion Government did not have any specific legislative authority at the time the Act of 1868 was passed relative to the licensing of companies. The attempt by the Dominion Government to regulate the business of insurance (other than purely Provincial companies), has been a subject of controversy for many years. As recent as 1931 —the Privy Council referred to the "domination" and "intermeddling" of the Dominion in insurance matters and concluded that:

> "A Dominion license, so far as authorizing transactions of insurance business in a province is concerned, is an idle piece of paper conferring no rights which the party transacting in accordance with provincial legislation has not already got, if he has complied with provincial requirements."

This observation was made in relation to the British and foreign companies.

In 1875 Ontario passed a law of general application prescribing what conditions should be included in fire insurance policies. A Canadian company with federal charter and a British company, both licensed under the Dominion Insurance Act, challenged the validity of the legislation on constitutional grounds. Thus was decided the leading case of Citizens Insurance Company vs. Parsons (1881) 7 A. C. 96, wherein their Lordships of the Judicial Committee of the Privy Council, in England, our court of last appeal on constitutional questions, held that the exclusive jurisdiction of the provinces with respect to "property and civil rights" included rights arising from contract, and that the exclusive jurisdiction of the Dominion with respect to the "regulation of trade and commerce" did not include the regulation of the contract of a particular business or trade such as the business of fire insurance.

In 1877, Ontario passed an Act respecting insurance companies, and in 1879, an Act to provide for the inspection of insurance companies was passed which provided in part:

> "For the efficient administration of the Insurance business in the Province of Ontario, the Lieutenant-Governor in Council may appoint an officer to be called the Inspector of Insurance, who shall act under the instructions of the Treasurer of Ontario, and his duty shall be to examine and report to the said Treasurer from time to time upon all matters connected with insurance as carried on by the Companies subject to the legislative authority of this Province doing the business of Insurance in Ontario, or required by the said Acts or by this Act to make returns of their affairs."

Looking backward it is hard to realize the extent to which insurance supervision has grown in the short space of less than sixty years in Ontario. At present there are upwards of 300 joint stock insurance companies licensed in the Province, not to mention the number of mutual insurance corporations, fraternal societies, mutual benefit societies, reciprocals and pension fund societies.

Annual statement blanks for fire and casualty stock companies in Canada are compiled on a strictly revenue basis, that is, assets and liabilities, profit and loss, with the analysis of surplus. Companies are permitted to show the unearned premium reserve in the liabilities at 80 per cent. This means that acquisition cost which is usually incurred at the time premiums are written, is taken into consideration in setting up the unearned premium reserve to the extent of 20 per cent. allowance. The details concerning premiums, claims, reserves, etc., by class of insurance are contained in separate schedules. Companies in Canada are not required to file the so-called "Casualty Experience Exhibit" which is necessary in New York State.

The extent to which insurers have included railroad bonds in their investment portfolio may cause some concern. It is generally admitted that the decline in railroad business is due to causes other than just the present depression. In all probability steps will be taken by the railroads in the future to be allowed to work out some system of consolidation and there will be more effective regulation of motor transportation.

Stock insurance companies incorporated in Ontario in making the annual return to the department are required to have the statement certified by the auditors in addition to the usual verification of the officers of the company. This certificate of the auditors reads:

> "We undersigned, the Auditors of the Company, Hereby Certify that we have carefully examined the within Statement and compared the entries therein with the books and records of the Company and that the said entries are correct. We further certify that:
>
> (a) we have audited the books of the company and have verified the cash, bank balances and securities;
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> (b) we have checked the reserve of unearned premiums and that it is calculated as required by the Insurance Act;
>
> (c) we have examined the reserve for unpaid claims and that in our opinion it is adequate;
>
> (d) that the balance sheet does not show as assets unpaid balances owing by agents or other insurers whose accounts have not been verified within the next preceding ninety days;

(e) the balance sheet does not include as assets, items prohibited by the Insurance Act from being shown in the Annual Statements required to be filed thereunder;

(f) after due consideration, we have formed an independent opinion as to the position of the company and that, with our independent opinion so formed, and according to the best of our information and the explanations given us, we certify that in our opinion, the balance sheet sets forth fairly and truly the state of affairs of the company; and that

(g) all transactions of the company that have come within our notice have been within its powers."

If a company is examined as of the date of the last annual statement, I believe that agents' balances and outstanding premiums which were outstanding more than ninety days and therefore non-admitted at the end of the previous year, should be allowed as admitted assets by insurance department examiners if on examination, or at the time of the examination, it is found that such overdue premiums or balances had actually been collected in cash. Others will disagree with me on this point. If, for example, claim reserves are (say six months after the close of the year) found on inspection to be insufficient, the examiner will have no hesitation in adjusting the reserve set up by the company. Similarly then, I believe non-admitted assets subsequently realized should receive the same consideration.

One might question the wisdom of companies in the past having been allowed to value their securities owned above book value, where at the annual statement date the investments at market value were in excess of the amortized value of bonds or, in excess of cost in the case of stocks owned. If this practice or method of valuation of bonds on the amortized basis and stocks at cost had been followed a number of companies would not have been so badly hit in the present depression. Unfortunately, laws governing insurance investments have not kept pace with changing economic conditions.

In connection with the use of Hollerith cards for the computation of the premiums in force, it is important for the examiner to make a test check of the individual punch cards in order to see if proper attention or care is exercised in the matter of the expiry year or policy term. If, in the case of large schedule poli-

cies, the wrong expiry year is punched on the cards it would be possible for errors to creep into the unearned premium reserve.

The verification of "provision for unpaid and unreported claims" in Canada is not as laborious as it is in the United States, since in Canada almost all of workmen's compensation is compulsory monopolistic state fund. Claims for other lines do not drag on so long and it is rare to find claims outstanding more than two years old.

Miss Maycrink has written a valuable paper for the Society and very little can be added to it. I notice in the last paragraph of the paper reference to the efforts which are being made towards standardization and uniformity in the insurance accounting and statistical record keeping. So long as companies differ in method of operation in the field it will be difficult to have uniformity in record keeping but the problem, while difficult, is not incapable of or beyond our solution.

## A METHOD OF ASSEMBLING AND ANALYZING THE DATA REPORTED UNDER THE UNIT STATISTICAL PLAN — MARK KORMES

VOLUME XVIII, PAGE 99

### WRITTEN DISCUSSION

MR. ROY A. WHEELER:

When reviewing this paper in which Mr. Kormes described the procedure of the New York Rating Board in handling the unit report system, one might recall Mr. Magoun's discussion of the procedure which the Massachusetts Rating Bureau uses in handling the Massachusetts unit report system.

It is noticeable that the first step in either procedure is to establish a control by carrier for each month of reporting. In both cases the reports as received are verified and the verified or corrected totals are entered on the carrier control card.

In both cases a punch card is produced for each risk. Other

punch cards are produced for the premiums of that risk and still others for the losses. Each card contains about the same information under either plan.

The Massachusetts procedure differs from that of New York by maintaining a second control by class. When all carriers have sent in their unit reports for a particular month of reporting and the punch cards from these reports have been proved to the carrier controls, these cards are then sorted into a class sequence regardless of carrier and tabulated to produce the information called for on Schedule Z. The totals are then entered into this second or class control and cumulated with what has been entered previously. In effect, this results in a gradual building up of Schedule Z during the year. From it, it will be possible to obtain advance information for a particular class or of all classes combined. Further, it will permit comparisons with like periods in other years either cumulatively or month by month. Such a record should be a valuable source of information for research and rate making. The overall control of the classes should agree with the overall control of the carriers.

Besides this class control, another difference in the two procedures is the method of producing Schedule Z. In the New York procedure any work on Schedule Z compilation is done without regard to carrier. In the Massachusetts procedure, however, the punch cards are sorted into classes and then each class is broken down into carrier. The cards so sorted are tabulated, producing carrier class totals which are at the same time accumulated into a state-wide class total. Furthermore, the results are recorded in triplicate by the tabulator on a form which becomes the filing form of Schedule Z, Massachusetts still requiring each carrier to submit its Schedule Z. Under this procedure, at a single run of cards, the Bureau produces a state-wide Schedule Z and a carrier Schedule Z, thus eliminating the duplicate effort which would otherwise exist between Bureau and carrier.

The class total as produced is checked with the class control while the total of all classes for a carrier should check to the carrier control. This double check produces a feeling of confidence in the reliability of the answers.

These two items would seem to differentiate the two procedures and yet they are purely operating differences. In both New York

and Massachusetts the carriers are asked for the same information and the punch cards of the two procedures show the same items of information with one or two minor exceptions. In other words, there is nothing to prevent either procedure operating as is the other.

Aside from the fact that Massachusetts still requires a Schedule Z filing of each carrier, the Massachusetts procedure is of value in more clearly showing discrepancies and chasing down errors. This control in the New York procedure is missing because its procedure produces master cards on risks, premiums and losses, thus losing carrier identity, and then uses these master cards for producing both Schedule Z and statistical information, whereas, the Massachusetts procedure uses the premium and loss cards for producing Schedule Z and depends upon the risk cards for the statistical information which may be wanted. If, for instance, a special study is required of a class or of an industry schedule class, from the risk cards, the risks contained in the class are listed and the unit reports themselves are taken from file and studied.

One interesting feature in Massachusetts which is of material benefit to the Insurance Department is that all awards, agreements, discontinuances, etc., are filed with the Industrial Commission in duplicate and one copy goes to the Bureau for its files. Furthermore, the Department maintains office space in the same building that houses the Bureau and the Department representatives stationed there check over with the records the special case reports, etc., as they are received by the Bureau with the unit reports, thus establishing their accuracy. Furthermore, as each month's figures are tabulated for the class control, they are audited by the Department representatives. As a result, when Schedule Z is finally prepared, it is ready for immediate acceptance by the Department, thus eliminating several weeks' delay which formerly existed.

MR. R. M. MARSHALL:

Mr. Kormes' paper on the unit statistical plan presents a discussion of a comparatively recent development of workmen's compensation insurance statistics and will be welcomed by all

interested in the subject. Mr. Graham's paper in the May, 1931, *Proceedings* gave us an insight into the method of preparing and submitting the data for the unit plan employed by a carrier, and now Mr. Kormes has carried the subject to a logical conclusion by describing a method of handling these data in a central organization.

Mr. Kormes' paper traces the progress of the data as submitted by the carriers through the various steps of auditing and recording and indicates difficulties that have been encountered at various stages. The paper is developed in a clear and logical manner and sufficient detail has been given to enable the reader to follow the process easily and to appreciate the tremendous amount of painstaking labor required. The paper also brings out very clearly the necessity of careful accuracy and uniformity in submitting the data.

The paper should be of value, not only to students and those company men dealing with this subject, but also to other central organizations who have charge of compiling the data submitted by carriers under the unit statistical plan. A comparison of forms and procedure employed by the different organizations will undoubtedly yield many valuable suggestions for changes and improvements.

The remainder of this discussion is presented for the purpose of bringing out differences between the procedure of the New York Board as outlined in Mr. Kormes' paper, and the National Council procedure. The experience of the National Council so far has been rather limited, as up to the present time it has dealt only with unit reports for the states of North Carolina and Georgia.

The first point that strikes one upon comparing the New York Board procedure with the procedure for other jurisdictions is the vast number of reports which the New York Board is compelled to handle. The volume of compensation insurance in the state of New York is so large that it practically places the state in a class by itself; and makes it necessary to adopt extra checks and controls which are not required in states with a smaller volume of business. For example, the Council has not found it necessary to punch "risk cards" or "master cards" for Georgia or North Carolina.

The New York requirements for reporting under the unit statistical plan are practically identical with the requirements in other jurisdictions and the preliminary audits of the data submitted follow essentially the same procedure. In the National Council the audit does not stop with the preliminary audit as described by Mr. Kormes but is carried through to completion. The additional process consists of an examination of the individual accident reports to determine if the occupation and cause of the injury are consistent with the classification to which the case has been assigned. The individual reports are also examined to see if the award is in accordance with the compensation law and if the injury has been assigned to the correct "kind of injury" division. This check is made for every risk submission. The majority of errors in incorrect assignment of classification are encountered in assignment of accidents to the governing classifications where they should be assigned to a subsidiary classification. This is particularly true of the standard exceptions. The "conditions affecting coverage" and "endorsements" are also examined to determine if the payrolls are split as required, and losses are examined to see that catastrophes are properly indicated. Mr. Kormes indicates that some of the reports are subject to final audit where the necessity for the same is indicated but he does not describe the details of this final audit. An audit of every risk along the lines outlined above would seem to be desirable.

There also seems to be some difference in the order of procedure. The New York Board apparently delays the final audit until after the exposure and loss cards have been coded and punched; while the audit is completed in the National Council before punching. In the Council the auditing and coding functions are combined in the same department. By first completing the audit, it is possible in many instances to correct errors before communicating with the reporting carrier.

Mr. Kormes' description of the new expiration record procedure of preparing punch cards to show policy number, carrier, Board file number, and date of issue is interesting and probably necessary where there are such a large number of risks. With a considerably smaller number of risks no difficulty is encountered in filing the reports of coverage, endorsements, and cancellation

cards alphabetically by expiration date. Then, when the experience card is received, the coverage cards are "pulled" and attached to the proper experience cards, and sent up for audit. In this manner the audit department has sufficient data to make a complete audit including the checking of required payroll splits.

The major difference between the New York Board and National Council procedure, however, lies in the punching of data. The Board has designed one card for recording either exposure or losses, the nature of the transaction being indicated by the punching of a "transaction" column. The Council employs a 45 column card and has designed one card for exposure and a different card for losses. Off-hand, this seems like a desirable precaution, as an error in punching the transaction incorrectly on a "universal" card might lead to considerable trouble.

In the Council's punch cards the first 20 columns on both cards are identical and are used for identification of the risk.

These columns show:

1. Month and year of issue
2. Term in months
3. Card serial number
4. Carrier code
5. State
6. Premium size
7. Governing classification
8. Type rating
9. Coverage

As previously stated, these columns are identical on the "exposure and premium" card and on the "loss" card.

The "exposure and premium" card also shows for each classification included in the risk

10. Classification code
11. Counter
12. Audited payroll
13. Audited premium
14. Experience modification
15. Schedule modification

For each risk a number of "exposure-premium" cards are punched—one for each classification reported in the risk. The

identifying information punched in the first twenty columns is identical on each card and the classification indicated in these columns is the governing classification of the risk. The remaining 25 columns are devoted to recording the exposure under each classification involved in the risk. The counter column is punched "1" on the card giving the exposure under the governing classification, and is punched "0" on each of the other cards giving the exposure under subsidiary classifications. In this manner there are a number of punch cards for each risk, only one of which, however,—the one giving the exposure for the governing classification—is punched "1" in the counter column. A run of the cards will therefore count the number of risks, and it is not necessary to punch a separate "risk" card. With the same volume as in New York, however, it would probably be desirable and even necessary to have one card to show total risk payroll, premium and losses.

There is a certain advantage in having the risk governing classification and the experience individual classification punched upon the same card. When this is done, it is a simple matter to conduct investigations regarding the relationship between the exposure under the governing class and under the other subsidiary classifications, and to determine the necessary rate adjustments if the scope of coverage provided by the governing classification is to be changed.

In regard to the type of coverage; in addition to indicating ex-medical coverage, the instructions provide for the carrier's indicating partial ex-medical coverage where the assured maintains his own hospital without reimbursement by the insurance carrier. It is noted from Mr. Graham's paper that the State Fund provides for indicating "partial ex-medical" on the punch cards which they prepare for their own use. If this system could be extended by the Board to cover all carriers, it would undoubtedly yield some interesting and valuable information.

Mr. Kormes has already commented upon the desirability of punching the actual merit modification for each risk.

Returning again to Council procedure, a separate "loss card" is punched for each claim. The first 20 columns of this card show the nine risk identifying items previously outlined and are identical for each card recording losses under the one risk. The

remaining 25 columns are devoted to recording the loss experience of each claim, and show:

10. Carrier's claim number
11. Month and year of accident
12. Classification to which the loss is assigned
13. Kind of injury
14. Compensation incurred cost
15. Corresponding medical cost
16. Claim counter

The card indicates whether the case is "open" or "closed," and facilities are also provided to show whether a catastrophe is involved and also whether losses are paid under the United States Longshoremen's Act.

A comparison of the information punched regarding losses indicates that the main difference between the two systems is that the loss card used by the National Council has been arranged so that both the indemnity loss and the corresponding medical loss are punched upon the same card. This reduces the number of cards which have to be punched, and at the same time permits a separation of medical into "compensable and non-compensable" medical and also allows an analysis of medical cost by kind of injury for any actuarial studies that may be desired along this line.

At the present time the unit statistical cards have been used mainly for Schedule Z purposes, so perhaps any prophecies regarding the adequacy of either system for other investigation are premature. Undoubtedly time and experience will suggest changes and improvements. Already circumstances have arisen that would make welcome some method of identifying occupational disease losses on the punch cards.

MR. CHARLES M. GRAHAM:

In discussing the comprehensive description of the office procedure of the Compensation Insurance Rating Board set forth in Mr. Kormes' paper, I shall follow the order in which he outlines the various steps.

*The Recording Division or Index*

The operation of the alphabetical index described has not been fully satisfactory. Numerous requests from the Board have been received in this office, requesting that the name and address shown on the experience report be investigated as to their accuracy, because of the fact that the Board had no record of the risk. In the majority of cases, the investigation disclosed that there had been a change of name and/or interest on the risk between the time that the original declaration had been filed, and the date that the experience report was prepared. An endorsement showing the change had been filed with the Board, but had not been entered by the Recording Division. As the experience card was prepared on the corrected basis, it naturally differed from the original declaration, but would have checked out exactly had the transfer of interest endorsement been properly recorded. It is recognized, however, that the tremendous volume of work involved in the handling of thousands of endorsements, has handicapped this division of the Board to an extent which should excuse a considerable number of routine errors. It is rather unfair, however, to charge all of the errors to the carriers, as it is known that the Board has erred in some cases.

*The Expiration Record*

This record seems somewhat unsatisfactory at the present time, because of the possibility of an error on the part of the Recording Division in assigning the Board file number. Such an error might cause two expiration cards to be prepared for a single risk, especially in cases where a change of name and/or interest has not been properly recorded. However, the Hollerith card Expiration Record described by Mr. Kormes in the latter portion of his paper which is effective on policy year 1932, seems to solve the question very satisfactorily. It eliminates the necessity of assigning Board file numbers to the experience cards from the alphabetical index, substituting therefor a numerical index, which, in the opinion of the writer, will eliminate most, if not all, of the difficulties heretofore encountered in matching the policy declarations with the experience cards.

*The Filing Division*

It has been brought out by the Board's request for a duplicate

set of individual reports (see Statistical Circular No. 26 dated April 26, 1932) that the original reports are filed in the individual risk statistical folder. The explanation has been offered that these individual reports are needed by the Rating Division and so are not available for filing elsewhere by classification. The duplicate set of reports is to be filed by classification. The writer does not see the necessity of keeping the original individual report in the statistical folder, as the Rating Division has all the necessary information on the experience card itself, except possibly in those few cases where recoveries from third parties necessitate a modification in the death and permanent total average value. As the carriers are required to report the net incurred loss on the experience card, small incurred losses on death and permanent total cases could be easily questioned by the Rating Division, and individual reports, even if filed in order by classification, should be readily available for exact information on the few claims which it would be necessary to investigate. In this way, the extra cost of a duplicate set of individual reports could be avoided.

*Statistical Routine-Preliminary Audit*

There appears to be much routine checking and auditing done by the Statistical Division of the Board which should be taken care of by the office filing the data. Reference to the writer's paper (The New York Unit Statistical Plan; A Method of Preparing and Reporting Data and Analyzing the Carrier's Business, *Proceedings*, Vol. XVII, page 190) will indicate that the State Fund assumes a large share of this responsibility. Much of the auditing procedure outlined by Mr. Kormes should gradually become unnecessary if the reporting carriers can be educated to devise ways and means of checking their data before filing with the Board. It is to be hoped that steps in this direction will be taken so that the Board's burden may be lightened.

*Punching and Verifying*

It appears to be in order to comment favorably on the improvement in the punching of loss cards suggested by Mr. Kormes under date of July 8, 1932 to members of the Board Actuarial Committee. This contemplates the recording of the entire loss on one claim (both compensation and medical losses) on one

punch card, by using the payroll columns for indemnity losses, the premium or incurred cost columns for medical losses, and the number of risks column for the punching of the designation for compensable claims. As Mr. Kormes points out, this will produce a considerable saving in the number of cards used, and will also make available the average medical cost by kind of injury. In view of the rising cost of medical treatment, additional data of this character may prove to be of considerable value. The check tabulations will now show indemnity and medical losses separately, instead of only total losses incurred.

*Revisions*

It is pointed out that the audit and recording of revision cards and second, third and fourth reports is considerably more laborious than the handling of original reports. This is naturally to be expected. The answer seems to be that constant use of the Plan will tend to eliminate errors, both by the carriers and the Board. The writer believes it proper to refer to the original report in recording revisions, to guard against improper adjustments which might be made if the "Previously Reported" columns of the revised cards were arbitrarily assumed to be identical with the original cards. When eighty-odd carriers are reporting data to the Board, probably no two of which use the same internal system, it is hardly to be expected that results will be uniformly accurate. If all carriers could be persuaded to punch their own Hollerith cards for internal analysis work from their experience cards before submitting them to the Board, the writer believes it would go a long way toward improving the accuracy of the experience cards themselves.

*Tabulation of Experience*

In connection with the recent change in the loss card outlined above, it is assumed that this change will be carried through to the master cards. There is adequate space on the master card to permit the separation of indemnity and medical losses. It also seems desirable to consider the separation of indemnity and medical losses on the risk cards. The writer believes that such a separation would be of greater value than the payrolls punched on the risk cards, as these payrolls usually cover a number of classifications, and are therefore of no value except as a check

on the payrolls punched on the premium cards. On the other hand, the question of rising medical costs has become so acute that all possible data that might be of value should be obtained.

After reading Mr. Kormes' paper, one cannot fail to be impressed with the magnitude of the Board's task and the difficulties surrounding its work. The introduction of the Unit Statistical Plan multiplied the detail work of the Board, and, as any new procedure will, caused great difficulty in the accurate recording of the mass of detailed information suddenly made available. Mr. Kormes and the entire staff of the Board are to be complimented on their handling of a difficult task.

## AUTHOR'S REVIEW OF DISCUSSIONS

### MR. MARK KORMES:

Mr. Marshall's discussion of my paper may be justly considered as a paper in itself because his description of the methods used by the National Council forms a valuable contribution to the future possibilities of unit reports. In particular, the method of showing the governing classification on all premium and loss cards is of vast importance in connection with studies which are conducted from time to time by rating organizations in determining the scope of the classification or the inclusion and exclusion of certain hazards when changing the phraseology of certain classifications. Mr. Marshall also points out that another important phase in obtaining valuable information is the punching of indemnity and medical losses on one and the same card thus permitting an analysis of medical costs for the various kinds of injury and at the same time reducing the number of punch cards to a considerable extent. The advantages of these features are so apparent that the Actuarial Committee of the Board has recently adopted both methods beginning with the punching of experience for policy year 1931.

Mr. Marshall also mentions the desirability of identifying occupational diseases on loss cards. This leads to the question of indicating the detailed nature of injury in connection with compensable claims which, however, would require additional

labor on the part of the carriers as individual reports are required only in connection with Death, Permanent Total and open cases. The vast majority of loss reports represent, however, closed cases and the information as to the nature of injury is not available. The information, therefore, obtained from the present reports would be only partial and hardly conclusive. At the present time, however, there is a tendency to reduce the amount of work rather than to increase it and unless future developments will make it imperative there is very little hope of adoption of this refinement in connection with the Unit Statistical Plan. So much for the positive criticism of Mr. Marshall.

As regards the audit of experience, Mr. Marshall is under the impression that the New York Board confines this work to a rather superficial review of the experience and that a complete audit is made in isolated instances. It is true that the paragraphs relative to the audit of experience are rather short and do not cover completely all of the phases of the work performed by the auditors so that many a reader may come to conclusions similar to those of Mr. Marshall. May I, therefore, be permitted to elaborate upon the statements relative to this work.

The review of the individual accident report is extremely thorough, every phase of it being scrupulously examined, not only as regards the classification of injury but also as to the assignment of the losses to the manual classification by reviewing the occupation of the injured and the description of the accident. Reserves are checked as to whether they correspond with the provisions of the Law and in all doubtful cases the carriers are immediately asked for additional information or explanation. Not only are losses criticised whenever undue proportion is assigned to the highest rated or governing classification but frequent accidents for a given classification are also compared with the payroll exposure shown for that classification to determine the reasonableness of their occurrence. As regards the payrolls and premiums it is the Board's practice to investigate all cases where the payrolls appear to be estimated and which indicate an arbitrary split of payrolls between classifications. Experience cards showing classifications which are frequently improperly assigned are referred to our Inspection Department for a check-up on the propriety of classification. It will be apparent from

the above that the audit work performed by the Board is as thorough and far reaching as possible under the circumstances. In view of the vast amount of reports received annually by the Board, a review of every single file is practically impossible.

As regards the technical question raised by Mr. Marshall relative to the desirability of punching premium, loss and risk cards on a universal card, it may be well to point out that the number of punch cards prepared by the Board annually is approximately a million and a quarter. The use of several types of cards would necessitate the separate punching of premium, loss and risk cards or repeated punching of thirty-four columns which are identical on all cards for each risk. This work is being done now on an automatic duplicator, but it would not be possible if different types of cards were to be used. Inasmuch as the loss and risk cards constitute approximately one-half of all the cards, the adoption of a different card would cause an unwarranted increase in the cost of punching. On the other hand, it should be noted that the Board has experienced no trouble whatsoever in connection with the use of the universal card for the reason that as soon as the check tabulation is completed (see page 108) the premium, loss and risk cards for each shipment are filed in separate cabinets so that any confusion is impossible. The actual results of the tabulation for policy year 1929 where the differences between the tabulations and the controls are less than two-tenths of 1% for each type of card seem to prove the above contention.

Mr. Wheeler's discussion confines itself to the comparison of the method of tabulating the experience as adopted by the Massachusetts Bureau and the New York Board. He seems to favor the Massachusetts method of preparing carriers' Schedule "Z" and control by class in addition to the control by carrier. In this connection it may be well to point out that the primary purpose in the adoption of the Unit Statistical Plan in New York was the determination of the differences apparently existing between the risks of various premium sizes. For this purpose it is important to have the various premium size groups for each industry group brought to the manual level which is only possible under the procedure adopted in New York. From this point of view, the New York method of tabulating premium cards by industry group and by premium size group further subdivided

by classification and month of issue represents a more important tabulation than that of the individual carriers' Schedule "Z" experience. If the Massachusetts Bureau would desire to prepare such a tabulation they certainly would have to make a second sort and a second tabulation of their punch cards.

The fact that the carriers are forced to submit to the Massachusetts Insurance Department individual Schedule "Z" reports has caused the adoption of different methods in Massachusetts than those adopted in New York. On the other hand, the mechanical equipment of the New York Board was not until recently adequate and the preparation of individual carriers' Schedule "Z" experience was for this reason entirely out of the question. It may be also well to point out that the monthly preparation of carriers' Schedule "Z" does not permit the inclusion of revisions and forces the Massachusetts Board to include all revisions with second reportings. Thus, the value of either system is only relative if we consider the conditions under which each of the systems was adopted. As to the accuracy of the method adopted in New York we need only to refer to the insignificant discrepancies mentioned above and observe that with a tremendous volume of punch cards minor discrepancies are unavoidable.

In this connection, the author wishes to remark that the Board has recently adopted the monthly tabulation of all premium cards regardless of carrier by industry groups, premium size groups and classifications, followed by a subsequent tabulation of individual carriers' Schedule "Z".

Mr. Graham's discussion presents a review of the Board's work from the point of view of a carrier's statistical department. He has pointed out certain removable defects in the methods employed by the Board. Some of his suggestions go beyond the scope of the paper as they reflect the most recent developments in the office procedure. In particular, the writer is gratified to know that there are some carriers who go to the task of checking carefully the reports prior to their submission to the Board. If all carriers followed this practice it would undoubtedly tend to minimize the amount of audit work and correspondence and permit the shortening of the statistical procedure. The advantages are quite obvious.

## ON VARIATIONS IN COMPENSATION LOSSES WITH CHANGES IN WAGE LEVELS — PAUL DORWEILER

VOL. XVIII, PAGE 128

### WRITTEN DISCUSSION

MR. A. H. MOWBRAY:

This is a paper which many of our members may pass over lightly, if they read it at all, as a rather abstract mathematical discussion of theoretical problems. Thus its significance may be lost. It seems to me, however, that it is one of that type of papers referred to by President Tarbell in his opening address at the last meeting, which point the way to sounder practices in the business.

There are certain assumptions in the theoretical and mathematical discussion which are not rigidly true. I believe I was the first to advance them, some years ago. In my paper, to which Mr. Dorweiler refers, I presented tests of the apparent limits of error involved. While I think the assumptions are probably now as valid within such limits as they seemed then, were practical use to be made of precise values derived from the use of a standard wage table the results of using such a table should, of course, be checked by more recent data. I am sure Mr. Dorweiler would be quick to agree to this. Aside from this caution I find little to comment on in the paper itself.

The significance of the paper, as it seems to me, is found in Table V. The trends of loss ratios on the two bases shown in that table are important factual evidence on the question whether payroll or man-year is the better measure of exposure for workmen's compensation insurance premium computation.

In his previous paper, "Notes on Exposure and Premium Bases," (*Proceedings,* Vol. XVI, page 319) at pages 324-7, Mr. Dorweiler compared several bases for workmen's compensation premiums, and seemed to reach the conclusion that payroll is the best parameter of those studied for compensation costs. In discussing the paper (*Proceedings,* Vol. XVII, page 101), Mr. Wheeler raised serious question as to the theoretical soundness of this conclusion, indicating that perhaps Mr. Dorweiler has been influenced too much by present practice, and that further study was desirable. It would seem this paper arose from those

questions, but whether so or not it is, as I have said, an important contribution to that argument.

In his study of the data in Table V Mr. Dorweiler seems to have confined his attention to the relative responsiveness of loss ratios to changed conditions under two bases. Perhaps he has said nothing about the *manner* of response because it might have been obviously natural and at any rate is clearly shown in the table. But there are implications in that manner of response that seem to me of highest practical importance. If I am not mistaken, the adoption of the man-year or man-hour basis of premium in place of the present payroll basis would remove one cause of the difficulty in procuring approval of adequate rates for workmen's compensation insurance.

Under our present system of basing premiums on payrolls, it is necessary to increase rates as payrolls diminish, in general at a time when prices as a whole are falling. Despite the clearest possible explanation of the effect of limits and the fact that compensation is usually based on the average earnings of the injured over the past year, which average is higher than the current wage, the insured feels there is something wrong in this. True, his total premium may be less, but that is as it should be. It should be still less, for his rate is higher. It galls. This attitude is reflected in pressure upon supervisory officials against increase.

When wages and other prices go up, our loss ratios go down. If, as is usual, rates lag, then there is temptation to the various forms of abuses and excessive competition which tend to destroy the foundation of sound rates.

Were rates on a man-year or man-hour basis, Mr. Dorweiler's table shows these tendencies would be reversed. When wages fall, rates can be reduced. Not, it is true, in proportion to wages, and we might still have to explain the reason in the influence of the limits. But I believe the insured employer would more readily accept this explanation of an inability to go the whole distance than he now does when it is offered in justification of action contrary to the general trend of prices and unit costs. When wages rise, rates would have to rise, but not so far. This would be in line with other prices and would not stand out conspicuously. Further, generally wages tend to move up after other prices. Hence by watching indexes of the general price

level we might be warned in advance and be able to move more promptly. Again the use of wages of a past period for the compensation indemnity base would cause increased cost to lag behind increased wage, giving us time to adjust in advance.

If it be true that there is more malingering in times of low wages and slack employment, this would tend to prevent costs falling as far as we might infer from such a study as this. It would slacken our rate reduction. It would not add to our problem in getting *increases* as is now the case.

Against these arguments for a time rather than wage unit base for compensation insurance premiums which seem to follow from the results of this study and considerations suggested by them, we have the objection that it will be much more difficult to get the man-hours than the payrolls. It will make auditing more difficult and permit the dishonest insured more easily to deceive his carrier. Will it?

In most industries it is customary to pay employees on a time basis. Hourly, daily and weekly rates of pay are fairly stabilized in most establishments. It would seem that a careful audit should include an inspection of time books and that it should be possible to obtain from them as accurate a record as is now obtained of payroll by classification.

With all our present data on a payroll basis, the transition will be difficult. We shall have to find representative average wages by which to convert it to a time basis. We shall have to convince supervisory authorities of the correctness of the conversion. We have faced more difficult problems.

Unless I am mistaken in these conclusions to which this paper has led, is it not wise for this Society and all interested in sound rates for workmen's compensation insurance to begin an intensive study of the practical problems involved in the change from payroll to time-unit basis of premium?

We certainly owe a debt to Mr. Dorweiler for breaking new ground in this investigation.

MR. A. Z. SKELDING:

Mr. Dorweiler has made a valuable and illuminating addition to the many interesting contributions which have appeared in

the *Proceedings* under his name. A careful reading of the present paper will be of value both to the experienced insurance man and to the student preparing for the examinations of the Society.

It has long been realized that the use of payroll as the unit of exposure in compensation rate making is not entirely satisfactory. In normal times, with comparatively mild fluctuations, payroll may not be of paramount importance. However, with the advent of a period of industrial depression such as has been experienced in the last few years, with the resulting violent revision of payrolls, the basis of exposure for compensation rates does become of prime importance. This is particularly true due to the lag between the classification experience and the period to which the revised rates will apply. The use of unmodified past experience for the development of manual rates assumes, to a certain extent, that the conditions of the past are representative of the conditions that will exist while the new rates are in effect. While this may not be a particularly violent assumption in so-called "normal times," it is evident that the experience of two or three years back, particularly as respects the relationship between compensation losses and payrolls, is not a true measure of present-day conditions.

In recognition of the extreme importance of the effect of fluctuating wage levels on compensation rates, Mr. Dorweiler has prepared a comprehensive analysis for the purpose of examining "under conditions of changing wage levels, the relation of the compensation losses incurred to the exposure when expressed in payrolls and man-years, and to establish criteria for determining for which of these media there is greater responsiveness between losses and exposure."

Mr. Dorweiler points out that for the states included in his analysis and for basic rates established on a $30 wage, greater responsiveness is shown with the man-year basis of exposure than with the payroll basis. Although this is true, Table V also indicates that the use of man-year exposure, by itself does not entirely eliminate the shortcomings of the payroll basis of exposure. Neither basis produces, with varying wage scales, the expected loss ratio.

While we do not interpret Mr. Dorweiler's paper as advocating the substitution of the man-year for payroll it does seem worth-

while to mention, as pointed out in a previous paper by Mr. Dorweiler, that the use of payroll for premium determination offers a certain advantage which is not inherent in other methods in that "the need of payroll records for internal business administration and for reports emphasizes their importance, thus serving as an incentive to accuracy." It would appear that if payroll as a basis of premium were abandoned it would be necessary to substitute therefor some other criterion which could readily be obtained from the books of the assured. There are practical difficulties which stand in the way of requiring an assured to keep accurate records of data which are used for determining his compensation premium only and do not have a direct bearing on the routine conduct of his business.

If it were possible to obtain accurate current wages, it would be interesting to see a table, similar to Table V, using the current average weekly wages and the average weekly wages underlying the experience on which the rates were based.

Whether the added responsiveness to losses under the man-year basis of exposure is sufficient to outweigh the advantages of the payroll basis in other respects is difficult to answer categorically "yes" or "no." Other things being equal—unfortunately they are not—the fact that, in general, compensation benefits are a percentage of wages would make it appear that payroll, which is a function of wages, is the logical basis for premium determination.

The effect of arriving at compensation awards by the use of wages averaged over a definite period has been mentioned by Mr. Dorweiler. Under certain conditions, and perhaps the economic conditions existing today fulfill the requirements, this item may be of equal or greater importance than the lack of responsiveness of the exposure basis.

This reviewer has checked most of the formulae derived in Mr. Dorweiler's paper to see if any typographical errors have crept in. None were noticed, although all the derivations have not been scrutinized in detail. This is mentioned merely because such checking as was attempted emphasized the great amount of time which must have been required in deriving these formulae in the first instance. A reading of the paper does not stress the fact that the numerous formulae, which are read at a glance or two, each require many minutes of labor for their derivation.