DISTRIBUTION OF "SHOCK" LOSSES IN WORKMEN'S COMPENSATION AND LIABILITY INSURANCE.

BY

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Early in our studies we learn that the institution of insurance rests upon the paradox that *uncertainties,* when taken in the aggregate, produce *certainty.* It is the function of the insurer to assume the individual uncertainties of its policyholders and, by pooling these, to commute them into a single and definite certainty. Such is the process which creates the confidence so indispensable to the transaction of the world's business.

All this seems extremely simple, and it is simple in theory. In practice, however, as the insurance business is actually conducted, there are numerous fundamental principles which must be obeyed if proper results are to be obtained. Perhaps the most important of all these principles is that the paradox in question, which is commonly referred to as the "law of averages," does not function unless applied to large exposures. It follows that the less frequent a given type of loss, the greater the spread of exposure necessary to absorb it. If a type of loss which occurs infrequently be also one of considerable magnitude (a *"shock"* loss), the requirement of broad exposure to permit its proper absorption with safety and certainty can be even more readily appreciated.

It is conceivable, therefore, that as respects some of its obligations, an individual insurer, particularly if its operations be limited, may stand in a position similar to that of any one of its policyholders. There is always the chance that an extraordinary loss arising out of its transactions may seriously impair its finances and possibly force it into insolvency. Even an insurance carrier may require means of relieving itself of uncertainty. In fact, there are cases where approximate certainty is not secured until the risk of abnormal loss has been distributed and redistributed to the uttermost ramification of the insurance business.

It is the purpose of this paper to inquire into the various methods

employed by carriers underwriting workmen's compensation and liability insurance in providing for the distribution of these "shock" losses. This is a most important phase of the casualty insurance business since the obligations assumed involve the potentiality of catastrophes* of unlimited severity. There are few carriers with sufficient resources to stand by themselves in this field. As a general rule, outside assistance is necessary for the attainment of desirable safety of operation. It is here assumed, of course, that individual carriers recognize the existence of this problem and exert all normal means to safeguard themselves; that reserve and surplus are accumulated against unknown contingencies. But even though this be done, there are carriers whose resources will not guarantee absolutely that catastrophe or "shock" losses will be absorbed without disrupting their operations. These are the cases where some method of distributing abnormal losses over an exposure broader than that provided by the resources of the individual carrier not only is desirable, but is absolutely necessary to the safety and welfare of the business.

EXTENT OF OBLIGATIONS ASSUMED BY INSURANCE CARRIERS.

An examination of the obligations assumed by insurance carriers underwriting workmen's compensation and liability insurance will disclose the necessity for cooperation in dealing with certain phases of the insurance.

In workmen's compensation insurance many of the carriers use a standard policy form† with appropriate indorsements rendering it applicable to the legal conditions of the several States. This policy defines the obligation of the carrier as follows:

"One (*a*)—To Pay Promptly to any person entitled thereto, under the Workmen's Compensation Law and in the manner therein provided, the entire amount of any sum due, and all instalments thereof as they become due,

* The term "catastrophe" as it is used in this paper, may be defined as an accident which involves at least five death or permanent total disability cases. Catastrophies are presumed to result in "shock" losses; shock losses may originate in other ways, however, as for example, where a verdict for injury to one individual exceeds $50,000, or where, under a workmen's compensation law with liberal benefits, the compensation allowed on account of injury to a single employee, exceeds $25,000. There are many cases where the loss from an accident involving less than five persons reaches a sum which is substantial enough to warrant the use of the term "shock" loss.

† The "Universal Standard Workmen's Compensation Policy."

(1) *To such person because of the obligation for compensation for any such injury imposed upon or accepted by this Employer under such of certain statutes, as may be applicable thereto, cited and described in an endorsement attached to this Policy, each of which statutes is herein referred to as the Workmen's Compensation Law, and*

(2) *For the benefit of such person the proper cost of whatever medical, surgical, nurse or hospital services, medical or surgical apparatus or appliances and medicines, or, in the event of fatal injury, whatever funeral expenses are required by the provisions of such Workmen's Compensation Law.*

It is agreed that all of the provisions of each Workmen's Compensation Law covered hereby shall be and remain a part of this contract as fully and completely as if written herein, so far as they apply to compensation or other benefits for any personal injury or death covered by this Policy, while this Policy shall remain in force. Nothing herein contained shall operate to so extend this Policy as to include within its terms any Workmen's Compensation Law, scheme or plan cited in an endorsement hereto attached.

One (*b*)—To Indemnify this Employer against loss by reason of the liability imposed upon him by law for damages on account of such injuries to such of said employees as are legally employed wherever such injuries may be sustained within the territorial limits of the United States of America or the Dominion of Canada. In the event of the bankruptcy or insolvency of this Employer the Company shall not be relieved from the payment of such indemnity hereunder as would have been payable but for such bankruptcy or insolvency. If, because of such bankruptcy or insolvency, an execution against this Employer is returned unsatisfied in an action brought by the injured, or by another person claiming by, through or under the injured, then an action may be maintained by the injured, or by such other person claiming by, through or under the injured, against the Company under the terms of this Policy for the amount of the judgment in said action not exceeding the amount of this Policy."

The obligation under section one (*a*) refers to the employer's legal responsibility for payment of compensation. As compensation benefits are strictly set forth in the workmen's compensation statutes, the obligation, as respects the liability arising out of the injury of a single employee, is limited, although the various statutes differ a great deal in the amount of compensation allowed. In some States (*e.g.*, New York) life pensions are granted; in others the maximum compensation period is limited. In New Jersey, for example, compensation payments do not extend beyond a period of 400 weeks from the date of injury. There is, however, no limit as

to the number of claims which may result from a single accident. This, then, is where "shock" losses originate. A gas explosion in a mine, the collapse of a structure, a fire in a factory building, a railway disaster, a boiler explosion, and other occurrences of this type involving the possible death or disablement of numerous employees, create hazardous situations for the insurance carrier. And it should be noted that this hazard affects every carrier of insurance, whatever its field of operations, for while the chance of "shock" loss is greater in some industries than in others, it is, even in the industries of lowest normal hazard, a potential source of trouble. This thought needs no proof: the falling of a dirigible into a Chicago bank, the Triangle Waist Company fire in the New York clothing industry, and numerous accidents of similar nature have demonstrated that no industry is free from the danger of catastrophe.

The obligation under section one (*b*) covers any common law liability which may arise out of accidental injuries sustained by employees of the assured. It supplements the workmen's compensation coverage and is intended to provide completely for every contingency which may develop as the result of an industrial accident. Thus, it covers cases of individual employees who are not subject to the provisions of the workmen's compensation law, as where an employee is subject to maritime jurisdiction and may sue in the Admiralty Courts.* It also covers suits for damages for loss of service,† etc.

This part of the coverage is treated differently in different states. In some states it is not limited in any respect and covers any amount of damages which may be awarded an individual claimant as well as an unlimited aggregate amount due to collective injuries

* Just at present, because of the United States Supreme Court decision in the case of Stewart *vs.* Knickerbocker Ice Company, maritime employees are denied the benefits of state workmen's compensation laws. Special forms of coverage have been devised to meet this situation in stevedoring and vessel risks but the standard form of policy is still used in other cases where there is some element of maritime employment, as, for example, in ship building, ship repairing and dredging risks. In these cases the liability feature of the standard policy is very important as it covers claims by maritime workers in the Admiralty Courts, and may therefore apply to a large percentage of accidents in the individual risk.

† A case in point is where a father claims damages for "loss of service" of a minor who is injured in a work accident or where a husband presents a similar claim on account of injury to his wife.

occasioned by a single accident. In other states the liability for each person injured or killed is limited (for example, to $5,000), while unlimited collective loss as the result of a single accident will be covered. In still other states there are limits with reference both to the liability for each person injured or killed (for example, $5,000) and to the liability for each accident in which two or more persons are injured or killed (for example, $10,000). In all these cases, except the last, the insurance carrier undertakes to assure the policyholder that, subject to the possible limit of $5,000 per individual, he is relieved of all negligence liability, irrespective of the number of employees who may be injured or killed in a single accident. Here, again, is a potential source of "shock" losses.

The situation, then, is that even with the most careful underwriting the individual carrier in workmen's compensation insurance assumes obligations which involve serious possibilities. "Prohibited lists"—lists of risks which the individual carrier will not assume under any circumstances—offer some protection in that they permit the carrier to avoid certain extra hazardous lines. But the catastrophe hazard exists in some measure even though the operations of the carrier be limited to those industries which have the lowest normal hazard. In fact, it may be said that the lower the normal hazard, the greater the necessity for special provision for handling "shock" losses, for in these cases, while the abnormal losses occur infrequently, when they do occur they loom particularly large in relation to the normal premium income.

In liability insurance no standard forms having been developed, the policy forms vary from carrier to carrier. However, the coverage granted is similar, and any one form may be taken for illustration. Liability insurance protects the assured against "liability imposed by law . . . for damages on account of bodily injuries, including death resulting therefrom, accidentally suffered . . ." by an employee or a third person,* as the case may be. The general

* Public liability insurance, sometimes referred to as "third party" insurance, is of several kinds depending upon the business of the assured or the nature of the operations conducted by him. Thus, manufacturers' and contractors' public liability insurance is offered for the protection of manufacturers and contractors, teams public liability insurance is offered for the protection of owners of teams, theater public liability insurance is offered for the protection of theater owners, etc. In all cases the policy covers the liability of the assured for injuries done to persons, not his employees or members of his family.

practice is to limit this liability in two ways: first, by imposing a limit upon the liability for loss from an accident *to one person;* and, second, subject to the same limit for each person, by imposing a limit upon the *total liability* for loss from an accident *to more than one person.* Manual rates are quoted in terms of limits of $5,000 per person and $10,000 per accident. Thus in case one person is injured and secures a verdict of $6,000, the policy would cover $5,000 of this amount and the assured would be responsible for the remainder. In case two persons were injured, one securing a verdict of $6,000 and the other a verdict of $4,000, the carrier's liability would be $9,000—$5,000 for the first claim and $4,000 for the second. The coverage, however, need not be restricted to such low limits. Higher limits may be obtained upon payment of an additional premium. Published tables provide rates for limits as high as $50,000/$300,000, and limits exceeding these may be had if desired.

In these days when verdicts are increasing and policyholders are demanding broad cover it is customary to issue many policies with "excess" limits. Under this practice obligations are assumed which a carrier may not feel competent individually to handle. There is not the same inherent danger of "shock" losses as in workmen's compensation insurance, because the obligation may be limited to any desired amount. This, however, is largely a theoretical consideration, for active competition forces a carrier, which desires to maintain any sort of standing, to offer such insurance as may be required by the public.

We find, therefore, in employers' liability insurance, where it still exists,* the danger of catastrophes affecting a large number of employees. In public liability insurance of various kinds we find the possibility of severe losses caused by the falling of crowded elevators, theater fires, automobile collisions, panics, etc.—accidents in which numerous third parties may be involved. For these reasons liability insurance is another field where cooperation among insurance carriers may be required to guarantee absolute protection to the insuring public.

* Workmen's compensation has largely supplanted employers' liability in the United States. Today there are only five states which have not enacted some form of workmen's compensation law: Arkansas, Florida, Mississippi, North Carolina and South Carolina.

METHODS OF DISTRIBUTING SHOCK LOSSES.

There are several methods whereby the carrier transacting workmen's compensation and liability insurance may provide for outside assistance in dealing with prospective losses which it feels may exceed its resources, viz.:

1. It may arrange with other carriers interested in the problem to form a "reinsurance pool." In such an organization a number of carriers mutually band themselves together for the purpose of providing for the distribution of abnormal losses sustained by the members. In these cases the individual carrier, subject to the limitations of the agreement, may transact its business with the assurance that any loss exceeding a certain amount will be taken care of by the pool. The pool is supported by regular contributions of the members, but in case it should be inadequate to meet a particular loss, arrangements are made whereby assessments will be levied to meet the obligation. The combined resources of all cooperating carriers are, therefore, available for the distribution of a "shock" loss sustained by any member of the pool. Normal losses are not shared, but when the abnormal accident occurs the result is absorbed without undue shock to the business of any individual contributing carrier.

2. It may arrange with one or more other carriers for the "coinsurance"* of risks of certain types. Under one such arrangement, which will be later described, each carrier retains its own identity in underwriting its business, but the risks subject to the arrangement are assumed by all members in agreed proportions, each obtaining a definite share of the premium, and, in return, obligating itself for a like share of every loss which is sustained. Thus, the combined resources of all the

* This form of coinsurance is strictly an arrangement among insurance carriers and is not to be confused with another form of coinsurance which is an arrangement between an insurance carrier and a policy holder. The latter form of coinsurance is practiced in fire insurance and other forms of insurance protecting property and has been described as follows:

"A form of insurance in which the person who insures his property for less than its entire value is understood to be his own insurer for the difference which exists between the true value of the property and the amount of the insurance. Thus, in the event of a partial loss, when the loss is not greater than the insurance, the amount paid is in the ratio of the total amount of insurance to the full value of the property."

cooperating carriers are behind each insurance transaction, and the "shock" loss, when it occurs, instead of falling with undue weight upon a single carrier, is treated in the same manner as normal losses and is automatically distributed over a wide area.

3. It may purchase a contract of "reinsurance" just as an individual assured purchases direct insurance. By such means a carrier can offer to its policyholders the underlying security of the resources of one or more organizations in addition to its own. The "reinsurer" in return for a stipulated premium, as a general rule, obligates itself to assume any loss over a specific amount which the "direct writing"* carrier may sustain in its transactions. This practice usually covers an entire line of insurance, the reinsurance premium being a fixed percentage of the total premium income or a definite share of the premium for each risk subject to the agreement.

4. It may share an individual risk with one or more insurance carriers. Thus, a carrier may feel competent to deal with the ordinary run of risks which it writes or may have other arrangements for dealing with "shock" losses in certain lines of insurance, but may wish to assume an individual risk exceeding its resources or one which is either not fully covered or is not covered at all by its other arrangements. In such cases it may secure the assistance of one or more carriers, each of which may take a share of the liability in return for a share of the premium. This is a form of reinsurance, but instead of a regular arrangement, either mutual or by a contract of indemnity, affecting all risks of a given type, the reinsurance is arranged for a particular risk or risks as occasion arises.

The remainder of this paper will be devoted to a description of the foregoing methods as practiced in workmen's compensation and liability insurance. In a great many cases it will be found that the situation is exceedingly complicated; one carrier, in the distribution of its "shock" losses, may use several methods; the reinsurer may in turn provide for assistance in dealing with its obligation, as, for example, where a reinsurance pool itself reinsures its obligations

* The "direct writing carrier" is the carrier that issues the policy to the assured. This carrier is responsible for the administration of the contract and conducts all the relations with the assured, who may be entirely unaware of the existence of a plan to spread the hazard of his risk by distributing it to several carriers.

over a specific amount, or where a carrier accepting a share of the liability of another carrier provides for assistance in dealing with this obligation; a reinsurance pool may not only reinsure its members by mutual exchange of liabilities, but may also issue contracts of reinsurance to non-members. The way in which these arrangements are effected will be best disclosed by an examination of the situation as it actually exists in this field of insurance.

THE WORKMEN'S COMPENSATION REINSURANCE BUREAU.

On August 28, 1912, a group of stock company executives met in New York City and adopted the following resolution:

"WHEREAS the undersigned companies have engaged or are about to engage in the business of insuring against liability under Workmen's Compensation Acts in various States of the United States, and

"WHEREAS the companies may not be permitted or may not desire to limit their liability under such policies and there will be danger of a company suffering serious loss by reason of the happening of a catastrophe involving injury to or death of a large number of persons, and

"WHEREAS it is of the utmost importance both to the employees, the employers and the companies that undue loss to any one company should be avoided by the distribution of any such extraordinary loss among the various members of the Bureau;

"NOW, THEREFORE, for the purpose of obviating the dangers incident to this situation, and for the purpose of distributing any such loss among the companies, and thus protecting each company from such extraordinary hazard, the undersigned companies hereby agree to form an association to be known as The Workmen's Compensation Reinsurance Bureau."

The organization, thus effected at the very inception of workmen's compensation insurance in this country, began immediately to function, its transactions dating from July 1, 1912. Today its membership comprises eighteen stock companies, and its operations extend to every workmen's compensation state in which private carriers are permitted to do business.

According to its constitution, the object of the Bureau is to reinsure and reimburse each subscribing member for loss and medical expense, exceeding $25,000, arising out of a single accident sustained on a workmen's compensation policy subject to the terms of the agreement. Each member, with certain limitations, may transact such of its workmen's compensation business as is covered by

the plan, with the understanding that it will have to depend upon its own resources for losses resulting from individual accidents up to a maximum amount of $25,000 per accident. Whenever the total losses resulting from a single accident exceed this sum the excess becomes a claim against the Bureau. Both the strictly workmen's compensation feature and the underlying common law liability feature of the workmen's compensation policy are covered by the Bureau, but other forms of insurance, such as employer's liability and public liability insurance, are specifically excluded from its jurisdiction.

The general workmen's compensation business of each member is included in the agreement. Certain risks are excluded, however. The Bureau is not obligated "to pay losses under policies issued jointly or jointly and severally by several companies." This exclusion covers certain lines written by some of the members through The Associated Companies, an organization which will be described later. In addition, the following risks are excluded:

Coal mines.
Cartridge manufacturers.
Fireworks manufacturers.
Fuse manufacturers.
Powder manufacturers.
Dynamite manufacturers.
Nitro-glycerine manufacturers.
Manufacturers of any explosive (the definition of explosive in this connection is a substance manufactured or sold or used as an explosive other than one used in an internal combustion engine).
Operation of power or sailing vessels (excluding vessels of a registered gross tonnage of 1,000 tons or under).

These limitations are important because they make necessary other methods of dealing with these risks in case the individual company desires to assume them.

The affairs of the Bureau are under the direction of a board of governors and a staff of officers. The officers consist of a chairman, a secretary and two trustees. The chairman is ex-officio a trustee, making three trustees in all. The four officers and representatives of three other members of the Bureau constitute the board of governors.

The board of governors is the important administrative body. It recommends the extension of the Bureau to new states, has pre-

liminary jurisdiction over applications for membership, determines the basis of rates upon which premium payments into the Bureau are made by the members, supervises the collection of these premiums, decides whether certain individual risks are subject to the plan, has the right to audit and inspect the books of the members, receives and passes upon claims, controls the funds of the Bureau and decides when refunds may be paid to members, and in general exercises such other powers as are required to conduct the Bureau.

The trustees are charged with responsibility for the finances of the Bureau. Premiums are paid to them personally, and, subject to the direction of the board of governors, they invest and disburse these funds.

For the purpose of premium computation and loss adjustment the states over which the Bureau exercises jurisdiction are divided into two separate and distinct groups. Each of these groups has its own identity and the funds of each constitute an individual account.

The rate of assessment for the first group is 2½ percent of the net workmen's compensation premiums* subject to the plan. The majority of states are in this group.

The second group consists of states for which the rate of assessment is 5 percent of the net workmen's compensation premiums.

The distinction between these groups is based upon the compensation benefits of the several states, the higher rate of assessment being required where the benefits are substantial and where, consequently, there is greater chance of the cost of a single accident exceeding $25,000, thus creating a claim against the Bureau. For example, New Jersey, with its low benefits, is in the first group, whereas New York, with its liberal benefit provisions, is in the second.

Each member is required to report monthly, by states, its net premiums for the business subject to the plan and to remit to the trustees the proper reinsurance premiums indicated by these statements. The basis of premiums is fixed by the board of governors, which specifies a certain manual and merit rating system as constituting the authorized basis of rates for the Bureau. The premium payments are charged to the two groups, each of which is required to be self-sustaining. Provision is made that when the funds in

* "Business written plus additional premiums loss cancellations and return premiums without deduction of commissions."

either group, including premiums paid in and interest thereon, less losses and expenses, amount to more than $250,000, the excess over such amount, accumulated in any year, may be refunded to the members in the proportions in which premiums were originally paid. $250,000 must, however, be continually kept in each group and all losses and expenses must be accounted for before the annual refund may be paid. At present the annual premiums of the members are being regularly returned, the interest on invested funds being more than sufficient to provide for losses and for the expenses of the Bureau. The cost of the reinsurance protection offered by the Bureau has, therefore, been very small, being limited to a part of the interest on the funds in the custody of the Bureau.

In case any member, as the result of a single accident covered by the plan, sustains a loss exceeding $25,000, it is required to file proof of loss, including a complete copy of the policy and indorsements, if any, under which liability for the loss was incurred. Upon verification of the claim by the board of governors the trustees will reimburse the member from the funds of the proper group. Arrangements are made for assessments in case the available funds are not adequate to meet such claims as arise. The Bureau, at the present time, is carrying a reserve of $297,000 against ten catastrophes which have been reported and are now awaiting settlement. The following are typical accidents which have resulted in claims against the Bureau:

An explosion in a starch manufacturing plant in Iowa in which forty persons were killed and twenty-seven injured.
A fire in a Brooklyn, New York, factory in which twelve persons were killed and eighty-nine were injured.
An iron mine disaster in Michigan in which seventeen persons were killed and one injured.

THE MUTUAL CORPORATIONS' REINSURANCE FUND.

When New York became a workmen's compensation state on July 1, 1914, a number of mutual companies which were then organizing for the purpose of transacting insurance under the new law created the Mutual Corporations' Reinsurance Fund. The original purpose was to offer reinsurance facilities for the local business of New York mutual companies, but the Fund later broadened its scope to include mutual carriers organized in other states. Its membership today is composed of six New York mutual com-

panies, and the Fund covers the business of these members in all workemen's compensation states in which they operate.

The principle underlying the Fund is best expressed in the plan of organization, which provides that "each of the signatory corporations hereby agrees to reinsure each of the other signatory corporations to the extent and in the manner hereinafter provided against extraordinary or catastrophe liability."

The Fund assumes the excess over $25,000 of any loss arising out of a single accident covered by the agreement. In this respect it is similar to the Workmen's Compensation Reinsurance Bureau, but it differs from the latter organization in that it does not provide for unlimited coverage. In addition to the lower limit of $25,000, it imposes an upper limit of $75,000 upon its liability for a single accident. Provision is made, however, for reinsurance of the Fund itself, and such outside arrangements have been effected with the American Reinsurance Company. Under this reinsurance contract, the cost of which is paid out of the expenses of the Fund, and is thus shared proportionally by all members, coverage for a single accident is secured from $75,000 to an unlimited amount. Thus the members secure unlimited protection; each corporation carries the first $25,000 of any abnormal loss sustained on a policy subject to the agreement, the Fund provides for the next $50,000 of such loss, and any amount exceeding $75,000 is taken care of by the American Reinsurance Company under its reinsurance treaty. The maximum loss as a result of the occurrence of a single accident which an individual carrier must bear is $25,000, and the corresponding maximum for the Fund is $50,000.

The Fund covers nothing but workmen's compensation insurance and does not offer protection against every risk in this line, the following risks being specifically excluded:

Mines.
Cartridge manufacturers—including charging and loading.
Fireworks manufacturers.
Time-fuse manufacturers.
Powder (used as an explosive) manufacturers.
Dynamite manufacturers.
Nitro-glycerine manufacturers.
Manufacturers of celluloid.
Projectile, shell or case—charging and loading.
Gasoline manufacturers—from casing head gas.
Picric acid manufacturers.

Employers engaged exclusively in wrecking and demolition.
Subaqueous work under pressure.
Subway construction.
Coffer-dam construction and maintenance.
Tunneling—where the tunnel is over 50 feet in length.
Operation of power or sailing vessels, excluding vessels of a registered gross tonnage of 1,000 tons or under.
Manufacturers of explosives (the definition of explosive in this connection is a substance manufactured or sold or used as an explosive other than one used in an internal combustion engine).

Provision is made whereby any member may, at its own cost, secure coverage for these classes of risk by appointing the management of the Fund its agent to effect reinsurance with Lloyd's or other insurance companies or associations, but no such reinsurance arrangements have been made through the Fund.

The administration of the Fund roughly corresponds to that of the Workmen's Compensation Reinsurance Bureau. It is provided that whenever the number of members exceeds ten an executive committee of five shall be appointed, but inasmuch as the present membership is limited to six carriers, this section is inoperative and the management is vested in an advisory council consisting of one delegate representing each member. The powers of this body correspond to those of the governing board of the Workmen's Compensation Reinsurance Bureau. In addition to the advisory council there are three trustees who are responsible for the finances of the Fund.

The rate of assessment is uniform for all states covered by the Fund and is 5 percent of the net written premiums calculated upon a uniform manual of rates and merit rating system. Provision is made that "whenever the Fund shall exceed the sum of $200,000 over and above expenses, losses and reserves set aside for losses, the said excess shall be distributed for successive fund years, commencing with the first fund year, to the signatory corporations in the proportions in which they made payments for such fund year." The expenses include the cost of reinsurance above $75,000 with the American Reinsurance Company.

The adjustment of losses follows practically the same procedure as in the case of the Workmen's Compensation Reinsurance Bureau. It is provided, however, that in case the funds on hand are inadequate to meet claims, the total additional assessment which can be levied in any one year shall not exceed 5 percent of the premium writings of the members for that year.

The Fund to date has not sustained a single loss and the entire amount of contributions for 1914, 1915, 1916, 1917, 1918 and 1919 have been returned to the members. As the interest on invested funds greatly exceeds the expenses of administration, the members have enjoyed that part of their reinsurance protection between the limits of $25,000 and $75,000 at a nominal cost.

THE MUTUAL UNDERWRITERS' SYNDICATE.

The Mutual Underwriters' Syndicate was organized in Chicago in June, 1918. There are two classes of members—"Underwriting Members" and "Reinsured Members." The underwriting members constitute the actual membership of the Syndicate, these carriers exchanging reinsurance among themselves and at the same time offering reinsurance contracts to outsiders ("reinsured members"). Application for underwriting membership on the part of a mutual carrier is subject to unanimous approval by the underwriting members, and carriers are not admitted as underwriting members unless they have a net cash surplus in excess of $200,000. There are at present six underwriting members in the Syndicate and the combined surpluses of these members exceed $5,000,000.

The Syndicate specializes on reinsurance for workmen's compensation insurance, but it also accepts reinsurance on employers' liability and public liability hazards. There is no uniform agreement as in the case of the two reinsurance arrangements already described. The requirements of each carrier are covered* at a definite rate of premium which depends upon the exact nature of the reinsurance obligation assumed in each individual case. This plan applies to underwriting members as well as to reinsured members. The premiums and liability under each contract are distributed among the underwriting members in accordance with certain agreed percentages. In the case of an underwriting member, however, the contract is underwritten by the remaining underwriting members, and the member being reinsured is not permitted to assume any liability under its own reinsurance contract.

The contract covers an entire line of insurance such, for example, as workmen's compensation, without the exception of any specific types of risk. The extent of the obligation assumed varies with the requirements of the reinsured carrier. It is usual for the

* This practice is known as "treaty" reinsurance and will be more adequately treated in another section of this paper.

Syndicate to assume losses exceeding $10,000 resulting from individual accidents. The upper limit varies according to circumstances and may be for any agreed amount under liability policies or may be unlimited under workmen's compensation policies. Notwithstanding the low limit assumed by the Syndicate, no losses have been sustained under its contracts up to the present time.

The Associated Companies.

The Associated Companies was organized by ten stock companies in Hartford, Connecticut, on February 1, 1915. The plan was to provide some method whereby the members could with safety assume certain extra-hazardous workmen's compensation risks. There have been some changes in membership, five of the original stock companies having been replaced by three others, and, in addition, the scope of the organization has been broadened somewhat so that it now embraces some lines of public liability as well as certain workmen's compensation risks which it was originally intended to cover. The purpose, however, remains the same, and is:

"To furnish speedy and effective means to each member for the coinsurance of risks accepted by such member which are as described and defined in this agreement. Each member transacts its own business, fully administers its own risks and in every respect preserves its identity. The insurance undertaking in all Groups shall be in coinsurance form and shall bind all members jointly and severally to the entire insurance obligation."

Each member, therefore, writes its own business subject to the agreement and issues to its policyholders a contract under which all the cooperating members share the premiums and losses. There are eight members and the shares are equally divided; it follows, therefore, that the premium on each risk (excluding a definite amount reserved for the expenses of the "proposing" company)*

* "The Proposing Company is the member which secures a risk. . . . The Proposing Company shall issue the joint and several policy of The Associated Companies for all risks placed with The Associated Companies under this agreement, with notice of such issue and all necessary details to the General Office of The Associated Companies forthwith in due course of mail, shall collect the premium, pay the commission thereon to the agent, administer the risk during its existence, be empowered to give and receive notices as in the policy provided, adjust the losses, supervise and make claim payments, and audit the payroll, all of which shall be undertaken by the Proposing Company at its own expense and through its own employees, except only that the

is divided into eight equal parts, and that the liability is similarly distributed. Under this arrangement some of the most hazardous lines are underwritten without undue strain upon the resources of an individual carrier.

The reasons which led to the formation of this organization are interestingly set forth in the following "argument," which prefaces the agreement:

"The development of any plan for suitable compensation to injured workmen presents many serious problems in all classes of employment due to the long-continued obligation which necessarily results from any well-devised compensation plan and the most serious hazard of far-reaching catastrophe with large resulting claims and long deferred payments. Some forms of employment present far more serious problems than others. Several forms of employment involve not only extremely hazardous undertakings with frequent single injuries, but also involve most serious collective hazards involving simultaneous injuries to a great many persons. Several other forms of employment involve one or both of these elements to a greater or less degree and in addition an insignificant number of plants or amount of payroll to provide reasonable distribution if such risks are divided among many companies, each carrying a few individual risks. To meet the legal as well as the ideal requirements of the compensation obligation from an insurance standpoint, it is necessary that the insurance protection shall be unlimited in amount. An insurance obligation presenting these serious possibilities can not reasonably be undertaken by a single stock company . . . with the hope that the obligation may thus be safely distributed. Nor is it desirable that the obligation should be divided among several companies, leaving the insurance protection complicated in form and compelling those who claim under it to pursue various remedies. The Associated Companies express the belief that the conditions which result in injuries to workmen in the specially hazardous employments which are the subject matter of this agreement are capable of great improvement, which improvement can be more effectively accomplished by consistent, concerted action than by the unaided efforts of any single insurance company. Therefore, The Associated Companies have entered into this agreement for the purpose of providing joint and several Workmen's Compensation and Public Liability co-insurance upon such classes as are hereinafter named and on such properly defined and described classes as may hereafter be specifically agreed upon and to secure by means of association such distribution of the possible excessive

actual indemnities paid, including statutory medical aid, together with federal and state taxes upon premiums, shall be equally divided between the members as herein provided."

loss due to the hazards in such risks as will render the writing of such business reasonably safe to each of the members and will provide for the assured adequate and complete protection of a nature that is at all times readily available. It is the further purpose of The Associated Companies by means of this association to use every legitimate means for the prevention of accidents in such risks.

All members are required to use uniform policy forms, each of which includes a paragraph is the following language:

"The Insurers, having chosen one of their number to act as the representative of all the Insurers upon this risk, the name of which company is hereinafter indicated as the 'Representative of the Insurers,' it is agreed that such company is duly empowered to act for and in behalf of all the Insurers in the issuance and administration of this Policy, including the collection of its premium, the giving and receiving of notices as in the Policy provided, the care and adjustment of losses, the audit of payroll and the final adjustment of premium. The Employer shall address all notices required by this Policy to, and conduct all correspondence relating to this Policy with such Representative of the Insurers. Notices to or demands upon the Employer by such Representative of the Insurers shall be accepted by the Employer as the notices or demands of the Insurers. The Registrar who countersigns this Policy has been duly appointed, authorized and empowered by the Insurers for that purpose."

The risks covered by the agreement are classified into three groups.

Group (A) includes risks which, if written by a member company, must be reported to the central organization. But before these risks are accepted they must be passed upon individually by the Governing Committee. This group, which is known as "Compulsory Risks Subject to Submission," comprises the following risks:

Acid manufacturing.
Certain chemical risks.
Analytical chemists.
Blasting.
Celluloid manufacturing.
Explosive manufacturing—including transportation and handling.
Leather (imitation) manufacturing.

Group (B) covers risks which, if written by a member company, must be insured with The Associated Companies. Risks in this group need not be individually submitted, but are automatically covered under the agreement. The group, which is known as

"Compulsory Risks Not Subject to Submission," includes the following risks:

Acetylene gas tank charging stations—operation.
Coal mining—underground and surface.
Coke burning.
Culm recovery.
Degreasing skins.
Garbage works—reduction or incineration of garbage or offal.
Junk dealers.
Match manufacturing.
Public automobiles.*

1. Livery automobiles, *i.e.,* automobiles of the private pleasure type, rented or used for livery purposes by the hour or day, subject to call from a garage only, not equipped with a taximeter and not offered for hire at stands, hotels, stations or any other places of public resort.
2. Taxicabs, omnibuses, sight-seeing automobiles, jitneys, automobiles for hire at stands and all other public automobiles.
3. Emergency ambulances, newspaper delivery, emergency cars or trouble wagons (electric light, telephone, street railway, etc.), fire patrols or salvage corps, express companies (such companies having express messenger service on trains or boats), mail trucks, police patrol, transfer (baggage or express).

Rubber reclaiming.
Salvage operations.
Stevedores—all classifications.
Vessels—all classifications.

The third group (C) is a list of risks which may be placed with The Associated Companies at the option of the members. This group is known as "Permissive Risks," but it is provided that, if one risk falling within a classification in this group is submitted, all other risks assumed by the member in the same classification must likewise be submitted. Group (C) comprises the following risks:

Aeroplane manufacturing.
Baseball clubs and parks.
Building raising.
Caisson work.

* The risks under this caption are covered for public liability only or for public liability and property damages in case both are written concurrently on a single risk.

Celluloid goods manufacturing.
Chimney construction.
Cleaning and renovating outside surfaces of buildings, including tuck pointing.
Composition goods manufacturing.
Detective agencies.
Dextrine, glucose and starch manufacturing.
Gas holders—metal—erection.
Masonry—building chimneys only.
Motion-picture film exchanges.
Oil- and gas-well shooting.
Painting.
Painting steel structures and bridges.
Quarries.
Rifle ranges or gun clubs.
Rigging—not ship or boat.
Saw mills—portable.
Shaft sinking.
Shooting galleries.
Tanks—metal—erection.
Threshing machines and corn shredders, ensilage cutters and harvesting machines (operation).

In calendar year 1920 the premium writings of The Associated Companies were distributed as follows:

Workmen's compensation—coal mines	$3,979,288
Workmen's compensation—other risks	3,431,925
Public liability—property damage—automobile risks	1,222,749
Total	$8,633,962

The Associated Companies maintain a central office which is, at present, located in Hartford, Connecticut. This is the central source of administrative rules, etc. The final word in all matters pertaining to the conduct of the business is vested in the members themselves. Strict rules are provided in the agreement covering the use of policy forms, the underwriting of the business, the calculation of rates, the methods of premium computation, etc. Questions of policy as they arise are subject to the unanimous vote of all members. Provision is made for two special departments at the central office; an accounting department and a department of inspection and safety. The first department is under the supervision of a special accounting committee of three selected from the membership of the organization. Uniform accounts are kept by the members and periodical reports are rendered to the central account-

ing office. By means of this machinery a prompt division of premiums, losses and expenses is accomplished. The department of inspection and safety devotes its activities largely to coal-mining risks, but is equipped to inspect other risks subject to the agreement as occasion arises. The department inspects, rates and provides accident prevention service for coal-mining, chemical, explosive and other unusual risks, on behalf of all members, the technical engineering problems involved making it desirable to have this work done by the central office.

Since its organization in 1915 The Associated Companies have had two catastrophe losses, both of which occurred in connection with coal-mining operations and fell in a single year—1920. The first was a gas explosion at a shaft-sinking operation, when five men were killed through contact of a spark or open light with gas generated when the coal seam was reached. The other involved eleven deaths and was caused by a gas explosion in the interior of a mine.

Coinsurance as a means of distributing risk is practiced also by carriers not affiliated with The Associated Companies. In such cases it is customary to arrange for coinsurance of specific risks as they come up in the underwriting of the carrier, and the arrangement is a matter depending upon the convenience of any two or more carriers who may desire to cooperate in this manner whenever abnormal risks are assumed. The plan, however, is similar, the cooperating carriers jointly and severally undertaking the insurance of each risk and arranging among themselves for the administration of the business and the division of premiums and losses.

Reinsurance by Contract (Treaty).

One of the most complex and at the same time one of the most fascinating phases of the insurance business is the practice of insuring insurance carriers. Instead of the comparatively simple relationship in the case of direct insurance—that of insured and insurer—this branch of the business involves a complicated mechanism that has ramifications extending to every section of the globe. It is not difficult to appreciate the desirability of this widespread organization. Certain risks involve such serious possibilities and such extraordinary liability that they must necessarily be automatically spread over as broad an area as possible. There must be cooperation among the insurance carriers themselves, as no individual

carrier could undertake the insurance single-handed. Thus it may be said that reinsurance is no more than the application of the simplest insurance principle to special cases of abnormal risk. It involves the application of the law of averages to hazards so great that they overshadow the resources of the individual insurance carrier. The organization by means of which these abnormal risks are absorbed is necessarily complicated, because the burden is so great that many carriers must somehow come in contact with it and share in it if the desired security and safety of operation are to be obtained.

Before attempting to discuss reinsurance in general and its application to workmen's compensation and liability insurance in particular, it will be desirable to define some of the terms peculiar to this subject.

The carrier that is reinsured is called the *ceding company.* This carrier may be either the direct writing carrier which has relations with the policyholder in the first instance, or it may be a carrier that has reinsured another and wishes to relieve itself of a part of the liability thus assumed.

The carrier that grants or issues reinsurance coverage is the *reinsurer* or the *reinsuring company.*

The ceding company *cedes* reinsurance to the reinsurer, which in turn *accepts* reinsurance. Each individual transaction in a reinsurance arrangement in which reinsurance is ceded by one carrier and is accepted by the other is known as a *cession.*

Where the reinsurer in turn reinsures the obligation which it assumes, either in whole or in part, the transaction is termed a *retrocession*—hence the designation of a carrier that accepts reinsurance of a reinsurance carrier as a *retrocessionaire.*

Most reinsurance companies have well-defined arrangements for retrocessions, so that any liability assumed, which is in excess of that which the reinsurer desires to retain, may be satisfactorily taken care of.

The reinsuring company may write its business in either or both of two forms; by *treaty* or on a *facultative* basis. A treaty is a general contract or agreement covering one or more classes of insurance. Under this arrangement it is obligatory upon the ceding company to report every risk as it is written, and in turn it is incumbent upon the reinsurer to accept every risk. The facultative arrangement, on the contrary, is an optional or selective proposition.

Instead of covering an entire line of insurance under a blanket policy, individual risks are covered, and such risks are subject to optional treatment by both parties; it is optional with the ceding company whether it shall present them for reinsurance and the reinsurer may accept or reject them at its will. In treaty practice the reinsurer trusts the direct writing carrier to underwrite its business satisfactorily and follows its underwriting blindly. In facultative business the reinsurer has an opportunity to underwrite each risk for itself, accepting liability if it chooses or refusing coverage.

In workmen's compensation and liability reinsurance the arrangement is usually what is termed *excess reinsurance*. That is to say, the reinsurer covers losses and expenses only in case they exceed certain limits specified in advance. This is to be distinguished from *pro-rata* or *concurrent reinsurance* which is written in some other lines and in which the reinsurer shares losses and expenses arising out of each and every accident irrespective of amount.

The term *limit* is used to define the relationship between the liability *retained* by the ceding company and the liability accepted by the insurer, the minimum *retention* of the ceding company and the maximum reinsurance assumed by the reinsurer being strictly set forth in the contract or certificate. The practice with reference to the fixing of limits varies with different types of insurance and with the nature of the risk assumed. The general term *multiple-limit reinsurance* is sometimes used to designate the extent of excess reinsurance. Thus a *one-limit reinsurance* agreement provides that the reinsurer shall accept liability equal in amount to that retained by the ceding company on any individual risk. If the ceding company retains limits of $5,000/$10,000, the reinsurer will take limits of $5,000/$10,000, thus providing a total coverage of $10,000/$20,000. Any number of limits may be assumed in individual cases subject only to possible limitations, imposed by law,* upon the total liability which an individual insurance carrier may incur upon an individual risk. Thus three-, four- or five-limit reinsurance treaties may be negotiated. In the case of a five-limit treaty, if the ceding company retains limits of $10,000/$20,000, the reinsurer will take limits of $50,000/$100,000, thus providing a total coverage of

* In New York, for example, certain classes of insurance are so limited that an individual carrier may not "expose itself on any one risk or hazard . . . in an amount exceeding ten per centum of its capital and surplus."

$60,000/$120,000. In facultative reinsurance, which will be described in the next section of this paper, it is usual for the reinsurer to limit its liability to an amount equivalent to that retained by the ceding company. In treaty practice the reinsurance may be for any number of limits, the number usually depending upon the retention of the ceding company.

In treaty reinsurance the reinsurer is advised from time to time concerning the business which it reinsures by *bordereaux*—periodical statements containing information with reference to the risks subject to the arrangement. The following data are usually presented for each risk:

1. Reinsurance number. Each ceding company uses a series of numbers which are applied consecutively to the risks subject to the arrangement in the order in which they are written.

2. Policy number of ceding company. It is the practice of insurance carriers to designate each policy that is issued by a number usually known as the "Home Office number."

3. Form of policy issued. This is designated in code, since the various policy forms authorized by the agreement are on file in the office of the reinsurer.

4. Name and address of assured to whom policy is issued.

5. Effective and expiry dates of policy. For example, if a risk is written for one year, the policy taking effect on January 1, 1921, the effective and expiry dates would be 1-1-21 and 1-1-22.

6. The gross liability incurred on the risk. For example, if an automobile public liability risk is written for limits of $50,000/$100,000, this fact is reported under this item.

7. The gross premium collected by the ceding company. This corresponds to the gross liability incurred on the risk and is determined from the manual of rates.

8. The net liability retained by the ceding company. Continuing the example stated under item 6, the ceding company might retain limits of $10,000/$20,000, in which case this fact would be noted here.

9. The liability ceded to the reinsurer under the treaty. If the treaty were a one-limit treaty, the liability reported under this item would be $10,000/$20,000.

10. The reinsurer's share of the total premium. This is determined as a percentage of the total premium in workmen's compensation insurance or it is calculated from the manual of rates in lia-

bility insurance. In the case used as an example it would represent the difference in cost between premiums for limits of $20,000/$40,000 and limits of $10,000/$20,000.

11. Remarks.

It will be noted that all of the essential information for the guidance of the reinsurer is contained in this exhibit. In this respect it corresponds to the "daily reports" of business written, which are forwarded to the home office of an insurance carrier by representatives in the field.

A peculiarity of reinsurance treaties is that they are *honorable* as distinguished from *legal* engagements. That is to say, they are expressly drawn as gentlemen's agreements with the distinct provision that all controversies will be adjusted by arbitration rather than in the courts. If the two parties in interest fail to agree upon a reasonable settlement of a difficulty, provision is made for arbitration. Each party will appoint an arbitrator to represent him, and the arbitrators in turn are required to select a third person to act as umpire. If there is failure to agree upon the umpire, each arbitrator will submit the names of three persons, two of the names on each list will be declined and one of the remaining two selected by lot. When the arbitration board is complete, briefs are submitted and a thorough discussion takes place. The decision when it is rendered is binding upon both parties. Provision is made that the members of the arbitration board shall be officials of insurance or reinsurance companies, thus insuring the selection of men who are in intimate contact with the technical problems that require consideration. While this elaborate mechanism for the settlement of disputes is provided for in the treaty, it is seldom that it becomes necessary to use it, the terms of the agreement being so definite as not to give rise to frequent controversies.

One further feature should be noted, and that has to do with the treatment of expenses. The liability of the parties subscribing to the treaty is determined with reference to the pure loss. To illustrate this let us assume a case where the ceding company retains limits of $5,000/$10,000 and the reinsurer accepts a corresponding liability. If an accident were sustained resulting in a verdict requiring the payment of damages in the amount of $4,000, and legal and court fees of $1,500, the entire cost would fall upon the ceding company, as the pure loss ($4,000) does not exceed the limits retained by the ceding company. In case, however, the verdict were

for damages of $7,500 and the court and legal fees amounted to $3,000, the ceding company would bear $5,000 of losses and $2,000 of expenses, while the reinsurer would assume $2,500 of losses and $1,000 of expenses, the expenses being divided in the same ratio as the losses.

Reinsurance treaties covering workmen's compensation and liability insurance are negotiated in this country by the following six carriers:

American Reinsurance Company.
Employers' Indemnity Corporation.
European General Reinsurance Company, Ltd.
First Reinsurance Company of Hartford.
Lloyds of London.
Norwegian Globe Insurance Company, Ltd.

Because of the existence of so many mutual pools there are comparatively few reinsurance treaties negotiated to cover workmen's compensation risks. In the beginning, when workmen's compensation was in its experimental stage, there was some demand for reinsurance protection between limits which individual carriers thought it wise to retain and the limits assumed by the various pools. Thus a carrier might have desired coverage between a limit of $10,000 per accident and the $25,000 limit assumed, for example, by the Workmen's Compensation Reinsurance Bureau. But as experience with this form of insurance was acquired the demand for this coverage practically disappeared. Today the demand arises principally from the carriers which have no affiliation with the several mutual arrangements described in preceding sections of this paper.

In workmen's compensation insurance, as has been pointed out, the coverage is practically unlimited, the so-called "lower limit" or limit of liability per individual being governed by the provisions of the workmen's compensation laws, and any number of cases resulting from a single accident being covered by the policy. Where reinsurance is undertaken the limits, therefore, refer to the total cost per accident rather than to both cost per accident and cost per individual. The reinsurance premium rate is usually a fixed uniform percentage of the net premium writings of the ceding company, the size of the percentage varying with the amount of reinsurance liability assumed in the transaction.

In the field of liability insurance treaties are becoming increasingly prevalent. Here there are two limits—a limit per individual

and a limit per accident—and the reinsurance premium for each risk is calculated from the manual of rates, the amount depending upon the limits assumed by the reinsurer.

EXCHANGE OF REINSURANCE ON INDIVIDUAL RISKS (FACULTATIVE REINSURANCE).

The field of workmen's compensation insurance is rather thoroughly provided with methods of shock loss distribution, and there are few cases, therefore, where a carrier requires special assistance in dealing with individual risks of abnormal hazard. The carrier, whose resources are limited, usually covers its workmen's compensation business either by affiliation with one or more cooperative organizations or by purchasing a contract of reinsurance. If these arrangements fail to cover certain types of risks, the carrier may refuse to write such risks. There are times, however, when it is desirable from a business point of view to take on individual risks which may not be adequately covered by available methods of shock loss distribution. If such cases arise, the carrier will find it necessary to attempt to negotiate for assistance in dealing with the obligation. In this way an individual workmen's compensation risk may constitute the basis for a reinsurance transaction, one carrier writing the risk, issuing a policy, administering the insurance, and for its own protection relieving itself of excessive liability by dividing the premium and arranging to share the losses with one or more other carriers. This is what has been referred to in the preceding section as *facultative reinsurance.*

While this situation is extremely rare in workmen's compensation insurance, it arises frequently in liability insurance where mutual arrangements and general reinsurance contracts are not as common owing to the practice of limiting the liability. Even where reinsurance is effected by treaty, as it frequently is, facultative reinsurance is practiced, because there are many cases where the limits provided by treaty reinsurance fail to cover the entire liability which the ceding company wishes to incur on an individual risk. A case in point is where a direct writing carrier wishes to issue a policy providing for limits of $50,000/$150,000 and can only cover $25,000/$75,000 of this amount by its own retention and by reinsurance under a standing treaty. If the risk is to be assumed at all, it is obvious that extraordinary arrangements must be effected

to meet the excess liability over and above the limits provided by the carrier's normal reinsurance facilities. This affords an opportunity for facultative reinsurance in which several carriers may cooperate to deal with the liability incurred upon an individual risk. Probably the best way to illustrate this practice is to give a hypothetical example of an arrangement which might be effected for the purpose of providing coverage for a liability risk.

Let us take the case of an insurance carrier which desires to issue a policy protecting the owner of a motion-picture theater against claims for damages arising out of "accidents sustained by persons while within the theater or hall (including rooms or other spaces appurtenant thereto and connected therewith by interior openings) and upon approaches, exits or sidewalks, by reason of the use, occupancy or maintenance" of the theater. Assume that it is desired to limit the liability of the carrier to $50,000 for injury to one person, and, subject to this limit per person, to $150,000 for injury to more than one person as a result of a single accident. Assume further that the manual premium for the risk, which provides for limits of $5,000/$10,000, is $1,000. The premium for limits exceeding $5,000/$10,000 (5/10) is determined by applying to the manual premium the factors in Limit Table "A." The appropriate factor for limits of 50/150 is 180 percent, thus producing a premium for the risk of $1,800.

Carrier "A" accepts the risk, issues a policy, and undertakes to administer the insurance. It feels, however, that it can not safely assume the entire liability. It arranges to retain liability for limits of 10/25 and secures the assistance of carriers "B," "C," "D," "E" and "F" in providing for the remaining coverage. The additional carriers assuming liability on the risk may be direct writing carriers or they may be reinsurance carriers. Furthermore, the first share of the excess liability may be automatically covered by a reinsurance treaty. In this case, however, for the sake of simplicity it is assumed that the reinsurance is entirely on a facultative basis, and is thus specifically arranged for the particular risk under consideration.

Carrier "B" agrees to assume liability between limits of 10/25 and 20/50, Carrier "C" undertakes to cover liability between limits of 20/50 and 30/75, etc.

The first problem is to determine how the total premium of $1,800 shall be distributed. The method of doing this is not a

fixed practice, but it is customary in such cases to use the limit table and to determine each company's share by ascertaining the premium for the risk for the different limits involved in the transaction. If this is done, the following exhibit will demonstrate how the total premium is allocated to the several carriers on the risk:

DISTRIBUTION OF LIABILITY AND PREMIUM.
Total Liability—$50,000/$150,000.
Total Manual Premium—(Limits $5,000/$10,000) $1,000.

Company.	Limit Assumed by Company (Distribution of Liability).	Highest Limits Reached by Company.	Charge for These Limits.		Distribution of Premium.
			In Percent.	In Dollars.	
A.....	10/25	10/25	139	1,390	$1,390
B.....	10/25	20/50	161	1,610	220
C.....	10/25	30/75	169	1,690	80
D.....	10/25	40/100	174	1,740	50
E.....	10/25	50/125	178	1,780	40
F.....	-/25	50/150	180	1,800	20
Total..	———	———	——	———	$1,800

This is only one example of an arrangement of this character and it purposely has been made as simple as possible. There is no limit to the complications which may be found in these transactions. Carrier "A," for example, might have retained limits of 25/75 and might have ceded the remaining liability to Carrier "B," both carriers "A" and "B" in turn securing the assistance of other carriers in dealing with these obligations. Or the obligation might have been distributed as indicated, every carrier except one retaining the entire liability assumed, and this individual carrier providing for outside assistance in dealing with its obligation. However, a general idea of the practice will be secured from the case selected for explanation.

Now, assume that an accident occurs which involves claims exceeding the limits carried by "A." The losses and expenses will be shared by the carriers on the risk to the extent to which they have assumed liability. Two rather extreme hypothetical cases will illustrate the principles involved.

I. An accident occurs in which nine persons are killed or injured. The total losses and expenses are $50,000. The cost of each case and the method of distribution to the carriers on the risk will be found in the following exhibit:

DISTRIBUTION OF LOSSES AND EXPENSES RESULTING FROM ACCIDENT I.

Claim Number.	Award.	Amount of Loss and Expense Assumed by Carrier.						
		A	B	C	D	E	F	All Carriers.
1.....	$500	$500						$500
2.....	4,300	4,300						4,300
3.....	0	0						0
4.....	2,500	2,500						2,500
5.....	7,000	7,000						7,000
6.....	10,000	10,000						10,000
7.....	25,000	700	10,000	10,000	4,300	—	—	25,000
8.....	100		100					100
9.....	600		600					600
Total.	50,000	25,000	10,700	10,000	4,300			50,000

In this case Carrier "A" is responsible for losses not exceeding $10,000 per individual or $25,000 for the entire accident. It is therefore responsible for the entire amount of the first six claims and $700 of the seventh claim. Carrier "B" is responsible, subject to a limit of $10,000 per claim, for the amount of the total losses between a lower limit of $25,000 and an upper limit of $50,000. It, therefore, assumes $10,000 of the seventh claim and the entire amount of the eighth and ninth claims. Carrier "C," subject to a limit of $10,000 per claim, is responsible for total loss between limits of $50,000 and $75,000. It must therefore cover $10,000 of the seventh claim. Carrier "D" is then reached, and in this case it is responsible for the remainder of the seventh claim, or $4,300. In this example the insurance is broad enough to cover the entire amount of each claim and also the entire amount of the losses resulting from the accident.

II. Another example of a serious accident which introduces several new principles is described by the following exhibit:

DISTRIBUTION OF LOSSES AND EXPENSES RESULTING FROM ACCIDENT II.

Claim Number.	Award.	Amount of Loss and Expense Assumed by Carrier.						
		A	B	C	D	E	F	All Carriers.
1.....	75,000	10,000	10,000	10,000	10,000	10,000		50,000
2.....	500	500						500
3.....	56,500	10,000	10,000	10,000	10,000	10,000		50,000
4.....	20,500	4,500	5,000	5,000	5,000	1,000		20,500
5.....	1,500					1,500		1,500
6.....	2,500					2,500		2,500
7.....	6,000						6,000	6,000
Total.	162,500	25,000	25,000	25,000	25,000	25,000	6,000	131,000

In this case the limit of the policy is reached on the first and third claims, and while every cooperating carrier is called upon to share in the total losses and expenses, the amount covered by the insurance is $31,500 under the total cost arising out of the accident. In this case the assured is responsible for the excess cost, and the only way in which he might have secured complete protection would have been by procuring insurance for higher limits, say, $75,000/$175,000.

CONCLUSION.

The writer was prompted to investigate this important subject by the fact that there is little or no literature available on it, and it was his thought that a paper in the *Proceedings* might be of some assistance to students of workmen's compensation and liability insurance. The paper is not technical. It is intended merely as an introduction to the problems in this field, the thought being that a description of the present machinery for shock loss distribution must be set down before a deeper analysis of these problems can be attempted.

The reason for the present lack of literature on the subject is that the practice of insurance by insurance carriers for their own protection has doubtless been looked upon as an internal company matter of primary interest to executives. However this may be, it is hoped that this paper will stimulate discussion of some of the phases of the problem which are quite obviously of decided interest to our members and upon which we may be able to offer some suggestions. The following is presented as a suggested list of topics which it would be interesting to review and discuss:

From the standpoint of the accountant; the proper treatment of reinsurance and coinsurance premiums and losses, particularly for annual statement work.

From the standpoint of the statistician; the effect of reinsurance and coinsurance upon statistical procedure, and particularly upon the preparation of standardized statistical analyses such as Schedules "Z" and "W."

From the standpoint of the claim adjuster; the preparation of reinsurance agreements and the adjustment of claims under such agreements.

From the standpoint of the actuary;

The determination of the conditions under which reinsurance or coinsurance is necessary for the safety of the individual carrier.

The determination of the amount of reinsurance necessary for the protection of an individual carrier.

The determination, particularly in liability insurance, of the limits which an individual carrier can safely assume on certain risks.

The calculation of reinsurance premiums, particularly in the case of liability insurance, where the distribution of the obligation may be extremely complicated.

The determination of proper bases for reserves against the obligations assumed under such practice.

From the standpoint of the underwriter;

This practice opens up the possibility of dealing with abnormal risks which can not be accepted in the ordinary run of business. It therefore involves a specialized conception of underwriting and the development of a special technique. A great many difficult problems would seem to be involved, such as the determination of how best to group risks of this character for the purpose of securing a stable experience, the possibility of selection against the carrier which freely accepts abnormal risks of this character, etc.