THE ACTUARY AS A CONSULTANT

BY

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All actuaries have probably at one time or another been asked to explain the nature of their work. As far as the layman is concerned the easiest way of answering a question of this kind is to cite one or more specific examples of not too technical a nature. For those desiring a somewhat fuller explanation the various qualifications and requirements for membership in the societies may be used to explain the matter. It is obvious that a few specific examples are not adequate criteria and the whole syllabus of study for the examinations too broad a gauge to use. A more nearly correct answer would be somewhere in between and this too would omit many intangible factors which are involved in actuarial work and which are nowhere directly covered in the literature of the profession.

A personal example of the difficulty of explaining the work of an actuary may be cited. My wife, upon inquiry, explained to our son that the actuarial profession involves work with numbers. This interesting item of information was broadcast to the neighbors and the many playground companions as "My daddy plays the numbers."

In attempting to prepare a representative list of examples of the work of an actuary, I was impressed by the fact that so much of the work depends on the calls made upon his services by other departments. Rarely is the work of an actuary, and particularly that of an experienced casualty actuary, confined to what one would characterize as a purely actuarial problem; more often is it a problem originating outside of the actuarial department, but which somehow requires the training, experience and background of an actuary for aid in its proper solution.

Following this line of reasoning it occurred to me that a good description of the work could be given by emphasizing the consulting phases of the work, both in company offices and in the work of independent consulting firms. The presentation could be made relatively easy by citing a sufficient number of examples of actual cases. Since nearly all of the examples have been submitted by consultants the paper has been entitled "The Actuary as a Consultant." It could just as easily have been called "Examples of the Nature of Actuarial Work."

The functions of an actuary and the work he performs are in a large measure determined by his own abilities and by the needs of the organization employing him. Certain minimum qualifications are established by the

examination requirements for membership testing both his knowledge and ability. In practice few men actually need or use all of their knowledge and abilities except in a general way. Each man confines his work to the particular needs of the organization employing him. Sometimes the needs are broad, sometimes narrow and highly specialized. If we consider our colleagues engaged in actuarial work, one by one, we can probably arrive at a fair idea of each individual's responsibilities in the particular position he holds. If we think of the actuarial department of any company, and of the men in it, we can also obtain a fair idea of the range of activities of the department.

The functions of an actuary are proven by the fact that many actuaries often become engaged in activities which are not actuarial. An actuary as a result of his work with administrative matters may become an executive. If his company has found the advice he has given to the underwriting department useful, he is quite likely to become an underwriter. If the statistical department requires his services he becomes a statistician. In all of these instances the individual, originally qualified as an actuary, proves more useful to his particular company in some other capacity. He is still of course capable of acting as an actuary. The fact that so many actuaries do become engaged in other phases of insurance work is fairly conclusive proof that many of the basic qualifications of an actuary are of value to other departments.

In examining the rosters of the societies we see that many actuaries have shifted their endeavors to other phases of work. Actuaries have become presidents, secretaries and assistant secretaries, treasurers, statisticians and chief statisticians, comptrollers, general managers, vice presidents, executive vice presidents, first, second, third and fourth vice presidents. Sometimes they also retain the title of actuary and call themselves vice president and actuary or secretary and actuary. I do not know whether this is to emphasize the fact that the company feels that the position or duties of actuary are to be maintained; or whether the individuals retain the title of actuary from a feeling of pride connected with the professional connotation of the word which may serve to place them in a class separate and distinct from the common garden variety of vice presidents and secretaries. Possibly they retain the title of actuary to denote their humble origin as an ordinary working member of the insurance fraternity who has come up the hard way.

When he is employed by an insurance company or organization, the actuary is consulted by the other departments on matters involving actuarial procedure. If he isn't consulted, the company is not making full use of his services. There is of course the additional possibility that he is not capable of giving advice on matters outside of his department. A study of the

requirements for becoming a Fellow would lead one to believe this would be improbable unless only a cursory knowledge of subjects was obtained sufficient for passing the examinations but not for actual use.

In addition to those members who are directly employed as actuaries by companies, and those members who have transferred their activities to other departments we have the independent professional actuary, operating his own office and unaffiliated with any company or recognized association maintained by insurance companies. He is usually called a consulting actuary. Often a number of men are associated and operate as a firm.

Perhaps the term "consulting actuary" should be clarified. In the medical profession a consultant is a doctor whom other doctors consult. A consulting engineer is usually one consulted by other engineers or engineering organizations. A consulting actuary is not in quite the same category. Since the majority of actuaries are employed by insurance firms and organizations, they are usually not in a position to give advice to other organizations or individuals. The consulting actuary may be consulted by insurance companies, by trade associations, by corporations, by brokers and agents, lawyers, governmental agencies, insurance departments, trust officers on estate and tax matters, by retirement and pension funds, by non-profit hospital and medical insurance associations and not infrequently by other actuaries who wish to obtain the benefit of an opinion on problems with which they are not as familiar as is the consulting actuary.

Such consultants are now and have always been an important element in the membership rosters of the Actuarial Society. As independent practitioners they give point to the fact that the actuary is a professional peculiarly qualified by his training and experience to render an important and useful service, whether as an employee or as an independent consultant.

Although many members of the societies know of the qualifications and abilities of the consultants either through personal association when such members worked in company offices prior to becoming independent consultants, or because such members have become fellows or associates by examination, few have definite knowledge of the exact nature of the work such consultants perform. It is assumed that the services of a consultant are somehow related to the work in company offices. There has been little published about the actual work, the methods used and the clients serviced by the consultants.

The fact that so little is known is in part due to the natural desire to keep their business relationships as quiet as possible as a protection from possible competition; also the majority of the recognized firms treat their relationship with their clients as a purely confidential one. They depart from this rule only when they are required to appear in public on behalf of the client.

This has undoubtedly been the principal reason for the relatively little public knowledge of their work.

Part, perhaps the major portion of this paper, will be devoted to actual case problems. Most of the papers in the various journals of the actuarial societies deal with broad general problems or with smaller ones discussed in great detail. In this paper each case will be presented briefly.

Aside from the inherent interest that each case may have, as an illustration of the problems presented to an actuary, the cases are of value as examples of the educational background, technical training and general understanding that an actuary must have of the insurance business as a whole. The actuary not only must be able to solve the purely technical details, but must also understand the administrative, underwriting and statistical relationship of the problem as a whole. He must know the sources of statistical data, the underwriting procedures, the rate making and rating procedure, must understand the manuals, know the effect upon reserves and company solvency of interest and mortality factors, and must also know of the day by day developments in the various fields of insurance and in the social, political and economic life of the country.

I am indebted to a number of the leading consultants for these cases. Each case has been rewritten and edited so as to conceal both the consultant and the client and any insurance companies that might be involved. Each consultant will probably think he recognizes his own case. Sometimes two related problems have been merged as one case if this served as a better illustration. In other instances matter considered as of minor importance or extraneous to the main problem presented by the case has been deleted. In any event, the author assumes responsibility for the treatment. To paraphrase the movies, any similarity of these cases to the problems of any individuals, organizations, insurance companies, living or dead, is purely coincidental.

The cases which treat with similar or related problems have been grouped to facilitate study and comment. The description headings and group titles are correct in only a general way.

Group I

Cases Involving Rating Procedures for Individual Risks

Case 1—*Evaluation of Three Competitive Insurance Proposals.*

A multiple line, interstate risk which had been carried by one carrier for years on a non-competitive basis, desired to place a portion of its business,

amounting to about $150,000 in annual premiums, on an overall retrospective basis. It had received a plan from its carrier, but had instructed its broker to receive bids from two other carriers. After receiving the plans, it was unable to evaluate them, in part because they were not on a comparable basis. The matter was referred to a consulting actuary.

The experience used by the carrier on the risk as the basis for its estimate and that used by the two competing carriers was different. The carrier on the risk when asked for the experience knew that the purpose for which it was to be used was to make a comparative estimate. Undoubtedly it was just an oversight on its part in compiling the data. It was of course a pure coincidence that the experience it had used itself would give a lower overall premium.

It was decided to use the experience of the latest completed policy year as the basis for comparing the three plans. Accordingly a schedule of the experience desired had to be drawn up and obtained from the carrier on the risk which will be designated as A and submitted to the other two carriers who will be designated as B and C. The underwriter in charge of the line and the statistician of carrier A assisted the broker and consultant in developing the experience. The statistician knew his statistics and did a fairly good job in gathering the basic data, which covered a number of different lines, states and locations.

After many conferences and discussions clarifying coverages, three plans with the resulting premiums based on the past experience were available. The estimates submitted by carrier B had to be returned for correction, as the consultant found that the wrong manual of rates had been used for developing the premium on an important line.

Carriers B and C had submitted well constructed plans. Both of these carriers had competent actuarial departments and the results were reflected in the plans submitted. Carrier A did not have an actuarial department and relied on its underwriter and statistician. The statistician, who had only a slight inkling of the purpose of retrospective rating was unsure of himself and was dominated by the underwriter who considered such plans not as modern rating instruments but as purely competitive devices for the purpose of cutting rate structures. As a result Carrier A submitted a "me too" plan. The underwriter was intent on keeping the business and simply adjusted all values to meet competition. The broker or the risk had apparently submitted hints on the contents of the other plans and Carrier A continued to submit revisions of its original plan.

An analysis of the three plans showed that while the "me too" plan submitted by Carrier A might possibly produce the lowest premium, it was basically unsound and did not properly take into account state rate regu-

latory requirements, excess limit losses per case and other factors necessary for the successful operation of such a plan of insurance. Even though it might develop the lowest premium it was bound to cause friction and misunderstanding between the assured and the carrier. The underwriting procedure was such as to make it difficult to determine which losses should and which should not be included in the retrospective premium determination.

The other two plans were sound and workable. However Carrier B was much more conservative and had placed much more of the premium on a guaranteed cost basis. The plan submitted by Carrier C was distinctly more advantageous to the assured, was clear cut and unambiguous and although probably developing, in its basic values, a higher premium than that of Carrier A, was recommended by the consultant.

Contrary to the advice of the consultant the line was placed on a retrospective basis with Carrier A for one year. At the end of the year the consultant was asked to verify some of the computations underlying the premiums. Losses not properly belonging in the retrospective agreement had been included. Of its own volition and without consulting the actuary further, the risk transferred the line to Carrier C.

The underwriter for Carrier A has been since promoted and is now high up in his company. The statistician has never been heard of especially.

Also, purely as a matter of incidental information, the risk had been referred to the consultant by the president of Carrier B.

CASE 2—*Relationship between Underwriting Judgment and Actuarial Procedures.*

A compensation risk had developed very good experience. On the basis of its experience rating it had received a modification of .267 which when applied to the manual rate of $5.00 resulted in a final adjusted rate of $1.335 for the risk.

The underwriter in charge of the risk was not satisfied and desired to lower the rate still further. It was admitted that the $5.00 manual class rate had been established to a large extent on a judgment basis, but it was a newly erected class for a new chemical process and there would not be sufficient experience for some time to come on which to revise the classification rate.

The underwriter insisted on doing something further for the risk and wanted the classification rates reduced. He succeeded in getting a 20% reduction and a new manual rate of $4.00 applicable to the renewal policy. This of course was also largely a matter of underwriting judgment.

By reducing the rate from $5 to $4 the credibility assigned to the risk

experience in the rating was also reduced. The revised modification was .355 which when applied to the $4.00 class rate resulted in a final adjusted rate of $1.420 for the risk. As this was an increase of 6.4% over the previous rate of $1.335 the assured demanded an explanation.

The underwriter is still trying to explain the matter to the assured. He believes it to be the fault of the experience rating plan but cannot locate any mistakes in the rating. As far as he is concerned the original adjusted rate for the risk was too high. He sees no reason why the proper solution should not be a reduction in the classification rate, even if this has to be on the basis of underwriting judgment. It is of course impossible to raise the rate back to $5.00.

The odd part of this story is that the company has a very competent actuarial department in addition to a very competent underwriting department. If the underwriter had consulted the actuarial department on the rate making and experience rating aspects of his problem before he launched on his crusade for lower manual rates on an underwriting judgment basis he would have saved himself and others a lot of trouble.

This is how it happened.

	Original Rate		Revised Rate	
	Risk Experience A	Class Experience B	Risk Experience A	Class Experience B
1. Manual Rate	—	$ 5.00	—	$ 4.00
2. Total Losses	10,000	60,000	10,000	48,000
3. Primary Losses	7,000	42,000	7,000	33,600
4. Excess Losses	3,000	18,000	3,000	14,400
5. "B" Value	7,500	7,500	9,400	9,400
6. "W" Value	.70	.70	.53	.53
7. Rateable Excess Losses (4) × (6)	2,100	12,600	1,590	7,632
8. Total Rateable (3) + (5) + (7)	16,600	62,100	17,990	50,632
9. Indicated Modification 9 *A* ÷ 9 *B*		.267		.355
10. Adjusted Rate (1) × (9)		$1.335		$1.420

CASE 3—*An Analysis of the Reasons for Poor Experience and High Rates.*

A concern had its compensation coverage cancelled by a number of carriers, first by stock carriers and then by mutual carriers. Its current policy was in a State Fund. It had been placed in a special group by the Fund so that in effect it was a self rated risk. Its premium rates were still high and it felt that its only remaining recourse was to become a self-insurer and thus save a lot of money. It engaged a consultant to take the necessary steps to enable it to become a self-insurer.

An investigation of the record of its past coverage revealed a deplorable situation as regards accidents. Safety survey after survey and recommen-

dations by the safety engineers of its previous carriers and current carrier were continuously disregarded. There seemed to be a division of authority between the persons responsible for the plant operations and the executive management offices. Instructions to carriers had been to make safety reports directly to the plant officials who in turn filed them away without taking any action. The record of losses and premium payments were however a main office matter. The main office was greatly concerned over the premiums it was paying, but apparently wasn't at all interested in the reasons for this, except that it believed that the insurance companies insisted on charging too much.

It was pointed out to the management that self insurance would not solve the problem but would more likely tend to aggravate it. There was sufficient evidence, based on the survey reports of the insurance carriers to show that the accident record was a management problem. Without these reports there would have been no check on the plant officials.

It was suggested that the main executive offices take direct responsibility for the safety conditions in the plants and see to it that recommendations by company safety engineers be rigidly enforced. It was further pointed out that its own past management or mismanagement was the most convincing argument against self-insurance. The only remedy was proper safety work which it could only learn on the basis of the advice given it by the qualified engineers of the insurance companies.

The management decided not to become a self-insurer.

CASE 4—*Establishing the Value of Self-Insurance in Renegotiation Proceedings.*

A concern operating two large subsidiary corporations was a self-insurer except for some miscellaneous Lloyds and excess policies. It had apparently operated as a self-insurer for a long time and had set aside a fund of $1,000,000 for catastrophe losses. Its operations were such as to make it liable to have losses of catastrophic proportions.

Upon the outbreak of the war it began manufacturing almost exclusively for the Government. The profits on the products sold to the Government were apparently large and finally the Government instituted re-negotiation proceedings to regain some of the excess profits.

The concern desired an estimate of the value of the self insurance which could properly be charged to the Government in the proceedings. Its actual losses and loss adjustment expense had been small, but the concern felt that it had placed its catastrophe funds, accumulated in peace time, at risk and in the event of a catastrophe would have suffered the loss.

Using the standard manuals and classifications and applying various rating plans several estimates were obtained of the premium that would have been payable had the concern been insured with private carriers. The matter was further complicated by the fact that there were two subsidiary corporations and the results varied depending as to whether they were to be treated as a single entity or separate entities for rating purposes. A minimum figure, a maximum figure and a reasonable basis for compromise were developed for the concern to use in the re-negotiation proceedings.

CASE 5—*Establishing the Future Cost of Insurance in Renegotiation Proceedings.*

A metal goods manufacturer was engaged in the production of war supplies for the Navy. He did not avail himself of the special plans available for war contracts but remained under the standard experience rating plan. Due to increase in operations a large number of inexperienced employees were hired and several working shifts were required. As a result the experience became progressively worse. The full impact of the adverse experience would be felt in the years 1946, 1947 and 1948. The manufacturer desired a renegotiation of his government contract to compensate him for excess insurance cost in the post war period.

The problem of determining the extent of a just claim involved a number of assumptions. These assumptions were made as respects the trend of the loss experience had there been no war and what it would be in the reconversion and peacetime period following the cessation of war contract work. Further assumptions were made as respects the payrolls during such a period. Unless these assumptions were reasonable and based on sound judgment and past experience of the risk they could not be justified.

Having made the assumptions it was necessary to calculate the effect of the experience rating plan (again assuming that no essential changes will be made in this plan) and determine in this manner the monetary amount of the excess premium due to wartime activities. In addition, in order to summarize the effect of the wartime experience the retrospective plan was suggested. The results obtained in this fashion were remarkably reasonable and satisfactory.

CRITICAL REVIEW

The above five cases each present a different aspect in connection with problems relating to individual risks. The first three cases involve underwriting judgment and the last two involve accounting. Cases 1 and 2 show the need of actuarial knowledge to supplement the work of the under-

writer. They illustrate the fact that modern casualty rating requires more than a cursory knowledge of the highly technical rating instruments. Rate-making and rating instruments although developed by the actuaries are nevertheless tools used by the underwriter and were in almost every instance established primarily for his use. The underwriter who lost the risk in Case 1 could only blame himself. He was on the risk and should have developed, in an orderly manner and on his own initiative a workable plan before the matter was opened to competition. The carrier and the underwriter lost the risk primarily because of failure to understand the appeal of retrospective rating and the nature of such plans.

Either an underwriter or an actuary would have reached the same conclusion in Case 3. Recognition that high premium rates are due to a poor accident record does not require actuarial training. The value of the advice in the case involved recognition of the basic conditions causing the risk to desire self-insurance.

Cases 4 and 5 present two diametrically opposed situations. In Case 4 the actuary is requested to establish the value, in a claim against the Government, of good experience, while in Case 5 the actuary is requested to establish the cost of poor experience. Although each of these originates as an accounting matter, they are primarily actuarial problems. As such of course the solutions involve many conjectural elements. The reasonableness of the claims depends on the proficiency of the actuary in the use of rating instruments and his grasp of the effect of experience upon rates.

GROUP II

CASES INVOLVING SUPERVISORY AUTHORITIES

CASE 6—*Representation before an Insurance Department on behalf of a Carrier in a Rate Deviation Case.*

A specialty carrier operating in a restricted field was denied its customary deviation from manual by a supervising insurance department, on the grounds that the policy of the department was to grant such deviations only if the requesting carrier could submit evidence that its expense ratio justified such a deviation. In this instance the full deviation requested was not justified on the basis of the expense ratios.

An analysis of the situation disclosed that rates for this particular line had not been revised recently and were in all probability out of line. Fur-

thermore, the method of operation followed by the carrier contemplated relatively large expenditures for safety investigation and legal expenses which in turn were reflected in a very low loss ratio year after year.

It was pointed out, in a brief prepared for the carrier, that the proper basis of determining whether a deviation could be granted was on the basis of the combined loss and expense figure, not merely on the expense ratio. It was shown that the underwriting results amply justified the deviation requested and that it was unsound to base a decision solely on the expense provisions without taking into account the entire rate structure.

The insurance department rescinded its action and granted the request for the deviation.

CASE 7—*Expert Opinion on behalf of an Insurance Commissioner in Life Insurance Company Conservation Proceedings.*

Under the laws of a certain state it was possible to write stipulated premium life insurance. There were a good many concerns organized which were run more in the interest of the management as a quasi-proprietary enterprise than in the interest of the policyholders. Since these concerns incorporated assessment provisions in their policies it was difficult to show on the basis of financial statements alone that they were in a hazardous condition. In attempting to take conservation proceedings the Insurance Commissioner became involved in a court fight.

A consulting actuary was called in as an expert in the proceedings, particularly on the point of the excessive expense at which the concerns were being run. The Actuary took the position that since these concerns were supposedly mutual enterprises and the policyholders were subject to supplementary assessments, if it became necessary, they should do at least as well for their policyholders as non-participating companies. Taking Mr. Cammack's paper on non-participating life insurance premiums (T.A.S.A., Vol. xx) a schedule of reasonable expenses for operating a company was established.

The formula contemplated that with respect to new business up to $6 per policy was allowable for the expense of medical examination and inspection. For the general running of the company including all general overhead $3.00 per policy plus 5% of the premium was allowed. Agency commissions were established at 50% of the first year premiums, nine renewals at 7½%, five renewals after that at 5% and a general collection fee on the subsequent fifteen years of 3%. Most of the companies did not have medical examinations so that no more than the actual expense for this item was allowed. This schedule gave somewhat more than Cammack's but could be considered as

comparable. In order to allow for some leeway 120% of this formula was established as a top limit of reasonable expenses.

Most of the companies involved had expenses that were 160% or more of the established standard.

Another approach was to determine the margin in the gross premiums on the basis of appropriate mortality tables and persistency rates after deducting expense reserve requirements and in this way determine the present value at the end of the first year of the business of the company. This was compared with the cost of putting on the business and it was shown that more was spent for the business than it could bring in.

A comparison of the salaries paid the presidents with that paid other insurance executives of responsible companies was also introduced by the Commissioner. That was probably as persuasive as the actuarial exhibits.

The accumulated evidence influenced the Court to grant the conservation proceedings requested by the Commissioner.

Case 8—*Determination of the Amount of Deposit for a Self-Insurer.*

A large corporation was a self-insurer as respects Workmen's Compensation in New York State. It desired to recover some of its substantial deposits with the Department of Labor and engaged the services of a consulting actuary to assist it.

The task required a complete review and valuation of several hundred open claims. In order to determine the possibility and probable cost of reopenings it was necessary to make a review of certain claims closed within the last six months and some types of claims closed within the last two years. A valuation of all Death and Permanent Total Disability claims was made on the basis of tabular values, and also of other cases involving life benefits.

In addition, the final report provided for a reserve for incurred but not reported losses, a reserve for underestimates and adverse development of open cases, and a reserve for contingencis.

The report was received favorably by the Department of Labor and a substantial refund granted.

Critical Review

Each of these cases involves a relationship between a carrier and supervisory officials. A judgment or ruling of some supervisory official is to be based on or at least is to be influenced by the opinion and findings of the actuary. In one case the actuary represents an insurance carrier, in another

an Insurance Commissioner and in the third and last case a self-insurer.

Case 7 is probably the most interesting case as well as a most important one. Insurance companies may not operate on an unsound actuarial basis. It is a function of the actuary to determine whether the operational methods are sound.

Group III

Management Problems of Insurance Companies

Case 9—*Advice on the Management of a Union's Accident and Health Department.*

A labor organization operating an insurance department had a management and 100% re-insurance contract with an insurance carrier as respects non-cancellable accident and health certificates. It desired to cancel this arrangement and assume full control of the line.

The insurance department was faced with the problem of installing a statistical system, establishing reserves and preparing the year-end valuation. It desired advice on the procedure to follow and at the same time wished to make a review of its policy forms, endorsements, underwriting procedure and rate structure.

A statistical procedure based on punch cards was installed. Tables for developing reserves on claims based on experience of companies writing similar benefit policies were developed to use for the first valuation, mid-terminal reserves for active lives based on the National Association of Insurance Commissioners Standards, using the morbidity rates of the Conference Modification of the Class (3) table and the mortality rates of the American Men Ultimate Table at 3% were calculated to be used for setting up the active life reserve. An estimate for incurred but not reported losses and a procedure for developing the reserve for the future were developed. Instructions for tabulating the basic data to obtain the year-end valuation figures were prepared. The policy forms, rate structure and endorsements were reviewed and undesirable forms of coverage were eliminatd. A report embodying recommendations for the conduct of the business and future procedure was submitted.

Case 10—*Underwriting Problems of a Casualty Company Losing Business to a Competitor.*

A carrier began losing a number of accounts to a competitor. In each instance the timing of the approach to the risk and the manner of solicitation led the carrier to believe that a former employee with knowledge of the effective dates and details of coverage was somehow involved.

A review of the records indicated that the carrier had been somewhat lax in its method of setting up reserves, which affected the rating of risks. In many instances reserves were too high, or had not been set up on a present value basis. Reserves for medical losses were maintained long after the recovery. Recoveries from subrogation cases were not credited to the risk losses. Classification assignments reflecting changes in the character of the risks operations were not promptly requested. Combinations of policies, where it was possible to make such combinations in the interests of the assured, had not been made.

It was suggested that more care be devoted to the proper underwriting and rating of risks so as to reduce the vulnerability to attack. It was also suggested that as many risks as possible be cancelled prior to the expiration date of the policy and rewritten so as to change the effective dates of the renewal policies. This would to some extent nullify the timing of the competitor's approach and give the carrier time to correct its underwriting methods.

CASE 11—*Services Required by a Small Life Insurance Company.*

A small life insurance company not having a sufficient volume of business to require the permanent services of an actuary decided to retain a firm of consulting actuaries on a yearly basis.

The consulting actuaries were required during the course of the year to perform the following services:

a. Prepare policy forms, premium rates, reserves, and non-forfeiture values necessitated by the passage of new minimum valuation standards.
b. Represent the company in hearings with the Insurance Department of its home State on problems arising out of the Department's examination report.
c. Calculate policy reserves, non-ledger assets and net premiums for use in connection with the Annual Statement.
d. Prepare amortization schedules for all bonds for use in the Annual Statement.
e. Prepare the dividend formula for application to policies expiring the following year, secure the Insurance Department's approval thereof and calculate the dividend rates for policies by year of issue, age and plan.

CASE 12—*Services Required by a Fraternal Benefit Society.*

A medium sized Fraternal Benefit Society decided that it would be more economical to retain the services of a consulting actuary on a yearly basis than to have a full time actuary.

In agreeing to furnish actuarial services throughout the year the consultant was required to perform the following services:

a. Prepare the Society's Annual Valuation Report. This included the calculation of policy reserves, a comparison of actual to expected mortality and the computation of the net rate of interest earned during the year.
b. Prepare the Society's Supplemental Valuation Report as required by the New York State Insurance Department.
c. Set up amortization schedules for bonds.
d. Review Society's constitution and by-laws to bring them up-to-date and simplify their construction and interpretation.
e. Prepare the new Juvenile certificates and calculate the assessments, reserves and non-forfeiture options therefor.

Critical Review

Cases 9, 10, 11 and 12 show various phases of assistance to management that a consulting actuary is in a position to render. They indicate that it may be more economical to have the advice of a competent actuary on a special problem or on a part time basis in place of a full time employee capable of performing the same functions. Cases 11 and 12 illustrating the services required by small life insurance companies may be particularly interesting to casualty men. In the field of casualty insurance so much of the rate-making, rating and statistical work are performed by the central bureaus, that it is often forgotten that life insurance companies do not function in this manner. Case 9—involving accident and health insurance—exemplifies that, if properly trained, both life and casualty actuaries are equipped to handle this lines. Case 10, wherein it was found that lax underwriting and rating procedures were responsible for loss of business, requires no special comment.

Group IV

Technical Advice Required by Insurance Companies

Case 13—*Transfer of Reserves from a 5% to lower interest basis.*

A large compensation carrier had its reserves on a 5% basis. Its investment portfolio yield was in excess of 5% but new investments and the necessity for re-investing maturing issues at a lower rate indicated the advisability of changing the reserve basis from a 5% to a 3% interest assumption.

The management desired to have appropriate reserve tables calculated using a 3% basis and engaged the consultant to prepare such tables.

After developing some test values on the 3% basis, the consulting actuary perceived that the use of the new values would practically wipe out the surplus of the carrier. Not desiring to submit a set of tables whose use would cause embarrassment to the client the consultant discussed the matter with the management. He received the surprising information that the management had always wanted to keep its surplus small. It had sizeable sums in its existing reserves which it could free to bolster its surplus. The management did appreciate being advised of the possible results of using the 3% tables and asked that a program be developed which would allow the surplus to remain at approximately the same level.

An examination of the procedure followed by the company disclosed that its reserve tables did not take into consideration the contingency of remarriage on the part of widows and that in other cases it had used a table of very low mortality rates. Accordingly by constructing reserve tables taking into consideration the remarriage contingency and a different mortality table, and by arranging a program which involved placing reserves for successive blocks of years on a 3% basis, it was possible to place the reserves, over a period of years, on a 3% basis without any marked fluctuation in surplus.

Apparently the carrier was still having trouble with its reserves and surplus because it later asked for tables on a 2½% and 2% basis.

CASE 14—*Rates and Claim Procedure for a Fraternal Sickness Society.*

A fraternal organization writing sickness insurance at a level rate for all ages, desired to have its experience reviewed and recommendations made relative to a possible change in its rate schedule to recognize age groups.

A review of the experience indicated that although on the whole the rate schedule was about right, there was the need for a rather marked increase in the rates for the older age groups. The experience had been getting progressively worse on the older classes. In his recommendations the actuary suggested that the new schedule should not be adopted for all members but only for new members. He pointed out that a sharp increase in the rates for the members now covered would cause many of the more desirable risks to drop their insurance while the less desirable would continue the coverage thus nullifying in a large measure the effect of the rate increase.

In a conference held with the managers the actuary casually asked how the validity of claims was determined. He was told that as respects new members, the character of the individuals proposed was closely investigated and their claims were carefully reviewed, but as respects the members who had been in the fund for many years, why, everybody knew them and their claims were honored as a matter of course.

The actuary suggested that before adopting the revised schedule, a special control group be appointed to review all claims carefully, that claimants be visited and that publicity be given to this procedure. Rates were increased but not to the full extent indicated by the experience.

The experience, reviewed a year or so later, proved much better than that indicated by the earlier study. It was surprising how much the health of the older and trusted members had improved when a fraternal interest was manifested in their welfare.

CASE 15—*Review of Reinsurance Contract.*

A small New York Casualty Insurance Company requested a consulting actuary to review its reinsurance contract covering Workmen's Compensation losses in excess of $10,000. The contract was negotiated many years ago and no cognizance was made of the change in the Law requiring payments into the Aggregate Trust Fund. It was necessary to review the entire experience under the contract and to make a special analysis of the experience during the last ten (10) years revaluing the reinsurance liability in the light of the new law. In view of the relatively small volume of experience, use was made of the study of the cost of excess losses completed by the N. Y. Compensation Insurance Rating Board (see Cahill's paper). The result of the survey was a modernization of the contract and a substantial reduction of the price thereof.

CASE 16—*Audit and Survey of Office Procedure of a Casualty Company.*

A multiple line casualty company anxious to place its operations on a more efficient basis decided to retain the services of consulting actuaries to make periodic detailed audits of the company's books of account and to make a report thereon of each audit.

In making this audit, the actuaries realized that the office system and management could be improved considerably by a complete survey and analysis of the company's operations. Accordingly, it recommended to the company that it authorize the actuaries to make such a survey. This recommendation was accepted and upon completion of the survey, the actuaries suggested new accounting and statistical procedures which improved the company's methods of doing business.

The actuaries were also retained by the company to check the reserves set up on accident and health and workmen's compensation claims and to represent the company before the Insurance Department in the matter of rate deviations and Department examination reports.

Critical Review

This group of cases shows a number of different technical problems presented to the actuary for solution. They include (Case 13) calculation of reserve tables; (Case 14) review of experience and establishment of rates by age groups; (Case 15) details of establishing rates for a reinsurance contract; and (Case 16) audit and survey of office procedures.

It is of interest to note that in some of these a supplementary problem presents itself. Thus in Case 14 in addition to the reserve tables a method of transfer had to be developed and in Case 14 in addition to the rates the method of application and the claim procedure were reviewed.

Group V

Problems Involving Legislative Proposals and Benefits to Employees

Case 17—*Technical Advice on the Cost of Workmen's Compensation Legislation.*

A bill radically amending the administrative and benefit provisions of a compensation act, with strong likelihood of passage, was about to be introduced. Labor was sponsoring the measure and certain Employers' Associations were opposing the measure. This is, of course, not an unusual situation.

One Employers' Association, recognizing that certain changes were inevitable, had prepared a substitute measure and desired an estimate of the effect of both measures on the cost of benefits, desired advice on some of the administrative changes, and desired a schedule of changes that would serve as a basis of compromise and which would also keep the increase in cost within certain limits.

Negotiations between the proponents and opponents of the measure started off in a cordial spirit of distrust and disharmony. No sooner did one side want something than the other would oppose it. If one side said black the other side wanted white. The consulting actuary, who was in the background, originally as a purely technical consultant on the actuarial cost of the measures, finally suggested a procedure to break the deadlock. Each side listed in the order of importance those changes in each bill which it favored. Each side also listed in the same order of importance those changes which it opposed, together with its reasons.

It was found that there was a surprisingly large area of agreement. There was much misunderstanding on the relative importance of certain items. The Employers' Association was much more liberal in its concept of benefit changes than had been anticipated but was opposed to many of the administrative changes.

When it was pointed out to both sides that some of the changes in benefit provisions and definitions would make many of the administrative procedures of the past inoperative anyway, the proponents eased up on some of the demands, and the opponents realizing that some of their opposition was pointless also became conciliatory.

Certain changes in provisions which, while not changing the actual benefits, did make for an easier administrative procedure, were suggested by the actuary and accepted. A bill acceptable to both sides was finally evolved.

Case 18—*An Analysis of the Cost of Benefits to Seamen.*

In connection with the introduction of bills in the U. S. Senate to extend the Longshoremen and Harborworkers Act to Seamen, the Senate Committee, after public hearings, ordered a study to be conducted to show the comparison of benefits under the Jones Act and the Compensation Act. Shipping concerns were requested to furnish individual reports on each claim made in 1938. An organization representing ship owners engaged a consulting actuary to make a parallel study by furnishing him with the copies of their reports. Some 6,000 such reports had been submitted. These reports had to be audited to make certain that the information was complete and not contradictory. Any questionable item discovered in this manner was adjusted by correspondence. The reports were then evaluated on the basis of the U. S. Longshoremen and Harborworkers Act, coded, punched and tabulated. A number of analyses were prepared; by kind of injury, by method of adjustment (whether with or without attorney) by ratings of the seamen, etc. A separate treatment was accorded to non-compensable illnesses. The results were remarkably close to those found by the governmental statisticians.

Case 19—*The Determination of the Amounts Due to Beneficiaries in the Settlement of Death Cases.*

A concern operated a fleet of vessels. As respects some of the personnel of the vessels, it was a self insurer. A number of its vessels were sunk and it desired to make settlements with the dependents of deceased crew members on the basis of benefit provisions of a compensation act, to which the dependents were agreeable. No state supervisory officials were involved.

An impartial estimate of the present value of the payments, taking into account a 5% interest rate, the contingencies of death and remarriage, and the durations and weekly amounts specified in the act was desired.

The present value of the payments to each family group and the amounts

due each individual in the family group were determined and were the basis of the settlements made between the concern and the claimants.

In one instance the widow was a young woman aged 22. The present value of the payments was relatively low compared to the gross amount undiscounted for interest, mortality and remarriage. The attorney questioned the value submitted by the actuary. It was explained that the probabilities of remarriage for a widow that young were very good and were reflected in the present value. The actuary also told the attorney that probably the remarriage rates were not correct for the war period when most of the eligible men were away in the services. The attorney remarked rather dryly that he didn't think that would bother the young lady as she was a Wave, and he understood was doing all right.

Critical Review

The actuary is expected to be able to determine the probable cost of compensation benefit provisions, pension funds and similar matters. The three cases included in this group illustrate the nature of such calculations. Case 17 illustrates the manner in which the actuary can and does influence social legislation. The presence of the actuary in the midst of the conflict between the employer and labor groups acted as a conciliating influence and enabled progress to be made and acceptable compromise to be reached. Case 19 involved the determination of the exact amounts due to certain beneficiaries after the basis and principles of the settlement had been agreed upon.

Group VI
Problems of Companies of Other Countries

Case 20—*Workmen's Compensation Problems in a South American Country.*

An insurance company of a country "south of the border" desired some guide rates and procedures based on United States methods of operation. Aside from the difficulty of translating our dollars and cents system to the currency of the country in question there were other problems of somewhat peculiar nature.

The government of the country had a certain definite measure of control over the operations of the company. In the settlement of workmen's compensation claims the company would become involved in a political situation as undoubtedly many claims would be controverted and pressure would be brought to bear on the claim policy of the carrier. At the same time important employers insisted that a strict observance of the benefit provisions be made in order to keep the cost down.

It was suggested that a proper basis whereby the company could separate itself from being a party in the adjudication of claims was to have an independent commission established, similar to the industrial boards and commissions in the states, to make awards and settlements on all claims. It was also suggested that the employers could have a representative at the hearings to see that each case was properly presented and adjudicated so as to assure the employers that the carrier was properly defending claims. The carrier would contribute toward the expenses of the employers' representative.

The larger employers who represented foreign owned corporations, claimed that working conditions, safety measures and other factors contributing toward accidents differed as between large and small employers. A manual rate would therefore not be equitable toward such employers as a group. They did not desire to be rated on an average rate basis. On the other hand the carrier insisted that rates must be adequate and uniform for all classes of risks. It would be political suicide to promulgate a prospective rate for large foreign owned corporations that was lower than the rate for smaller locally owned concerns.

It was suggested that a solution to the problem could be made by establishing a high level of rates and that the records be maintained to show the individual experience of the employers. At the end of the year an adjustment based in part on the size of the risk and in part on the experience would be made, subject to a certain minimum and maximum, and the risk either debited or credited with return premiums. The level would be high enough so that there would be little likelihood of debit premiums. It was in fact a modification of the participating form of operation. The employers were agreeable to this procedure, providing a tightly controlled accounting and statistical procedure was adopted so as to make certain that each employer's record was properly maintained.

CASE 21—*Procedures Followed in a South American Multiple Line Carrier.*

It is not only a source of satisfaction but also a definite thrill to be selected by a client from far-away lands to make a trip to a South American Country. A Columbian company writing life, fire, marine and casualty insurance desired modernization of its methods. A survey was to be conducted and the work done with the aid of an interpreter during the first few weeks at least. It was necessary to learn not only the methods and office routine but also the customs and attitudes of the people. Just a few items will illustrate the antiquity of the system found by the actuary. For every letter written, a copy was made by the use of special ink. Such copies were arranged chronologically and bound in volumes in half leather bindings so

beautiful that they would be the envy of many a decorator. These copies were in addition to the regular file copies.

Another instance was the accounting procedure. For every transaction made by an agent or branch office a separate letter of account was prepared. This letter of account was forwarded to the respective department of the company where it was checked and if found incorrect correspondence initiated. Only after all transactions of a given day were found in order and a complete record made in the given department, were these letters of account sent to the accounting department. As a result the status of agents' balances was not known till as late as two months after a given date. Statistics were kept on a calendar year basis exclusively. A profusion of meaningless analysis was being prepared, but certain essential data were not available. Punch cards and tabulating equipment were in use but were primarily utilized by the life insurance new business department. All policies were signed individually by the principal officers of the company.

In the frame of this digest it is impossible to describe the many details and ramifications of the problems and reforms which had to be made. It will suffice to state that the intelligent and splendid cooperation of the management and staff permitted a rapid and smooth modernization and the resultant savings were quite substantial.

CASE 22—*Review of a Social Security System.*

A Central American Republic desired to review its Social Security System and place it on a sound basis. After consultation with the International Labor Office it decided to engage the services of a consulting actuary.

The work involved a study of old age, invalidity, widows' and orphans' pensions. The law establishing the social security system did not contain provisions establishing definite scales of benefits. The law provided that only those employees earning less than a specified sum were covered and those earning over this amount were therefore excluded. The legislature was persuaded to amend the law to provide coverage for the first few thousand of annual earnings for these employees as well as other needed changes.

It was necessary to construct tables to determine the probable cost of the pensions and health insurance provisions, establish organizational, operating, and administrative procedures.

CRITICAL REVIEW

Cases 20, 21 and 22 show some of the insurance problems of neighboring countries. The three cases show that with modifications such problems are

those which also face companies in the United States. The small and large risk problem, the influence of political considerations, the desire for social security systems, the need for keeping abreast of modern insurance principles and methods are just as prevalent in South American countries as they are here. In all probability the future for actuaries is brighter in these countries where insurance, if it follows the pattern of growth in this country, is still in its relative infancy.

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These twenty odd cases which have been presented can hardly be said to represent the entire range of the work of the actuary. Taken together with the subjects discussed in the technical articles published in the various actuarial journals, they do give a somewhat broader picture of the work.