

**TRANSACTIONS OF SOCIETY OF ACTUARIES
1975 VOL. 27**

SPECIAL REPORTS

REPORT OF THE HISTORIAN—1974

THE Historian of the Society was appointed for the first time in December, 1973, and this is the first report. The terms of reference for the appointment are recorded in the minutes of the Executive Committee of September, 1973:

The Executive Committee discussed the need for publishing a history of the Society to record major decisions, activities and trends. At present, such information is contained in the minutes of the meetings of Executive Committee and Board of Governors, and in various articles in *The Actuary* and *Transactions* of the Society. It was the opinion of the Executive Committee that a Historian should be appointed to gather together this information for publication in a yearly history. The Historian should be a member of the Board of Governors, preferably someone who is in his second year of service on the Board.

Undoubtedly, the Executive Committee was aware that important changes are taking place in the actuarial profession and believed that it would be of assistance to the membership in understanding them if a report were prepared each year which recorded significant events and sources of information.

What is a significant event? An event is taken to be significant if the probability exists that it will affect the work of actuaries in the future. This report has been limited to events of this nature that have occurred in North America. The primary duties of a historian are to observe and interpret selectively, and the process necessarily is a subjective one. Obviously, a historian must strive for breadth of outlook. In the present instance, he has been assisted by a reviewing committee, Brian A. P. Fitzgerald, Gerald A. Fryer, and Roger A. Haslegrave, and by the many helpful comments and suggestions received from actuaries who are active in the affairs of the profession.

The body of this report contains descriptions of and comments on relatively recent actuarial events, supported by two appendixes: Appendix I contains items published in accessible form, while Appendix II lists items not published in readily accessible form. Copies of the items in Appendix II are attached to the master copy of this report, which is on file with the Society.

This report is expected to be the first of a series of annual reports. It is intended to follow other historical reports that have dealt with the more distant past, such as the paper by Victor E. Henningsen [1]¹ on the first twenty years of the Society and the book by Robert B. Mitchell [2] on the history of the actuarial profession.

THE ACTUARIAL ENVIRONMENT

As background to an understanding of changes in the profession, it may be helpful to outline some of the principal changes that have occurred since World War II that have had an influence on the environment surrounding actuaries:

1. Social changes have taken place, and there has been some weakening of family ties. Individuals have become more conscious of their need for economic security, but they have turned increasingly to government and to their employers, rather than relying on their own initiatives, for the execution of plans.
2. Worldwide monetary inflation and a twenty-five-year period of rising interest rates have brought some uncertainty to plans for pensions and insurance.
3. Public attitudes toward security plans and the trend toward consumerism have brought about more disclosure and more regulation.
4. There has been a growth in private pension plans, and with it have come increased awareness and higher expectations on the part of the public.
5. The capability and availability of computers have risen rapidly.

Before World War II the actuarial profession was small, not very well known, and proud of its standards, which were attained and maintained through education and examinations. At present the work of actuaries brings them increasingly into contact with the public, representatives of government, and members of other professions. Consequently, the actuarial profession simultaneously faces several major challenges: to adjust its techniques to the process of change, to maintain its standards in a manner that is visible to the public, and to develop quickly the organization that must accompany a public profession, including internal coordination and high standards of conduct, ethics, and discipline. Others, notably Thomas P. Bowles, Jr. [3], Robert C. Dowsett [50], and Morton D. Miller [4] in their presidential addresses, have drawn attention to the challenges that face our profession.

The events recorded in this report may be thought of as responses to these challenges.

¹ Items listed in the appendixes are referred to by numbers in brackets as is normally done with references.

SOCIETY OF ACTUARIES—INTERNAL ORGANIZATION

Public Expression of Opinion

It has been recorded [1, 56] that a constitutional amendment to permit public expression of opinion was narrowly defeated at the 1967 annual meeting. A revised version of the proposal with an expiry date of December 31, 1974, was submitted at the 1970 annual meeting and was approved in the form of Article X of the Constitution. During 1974 the recommendation was made that the expiry date be removed and the proposal be made permanent. Members were asked to ballot by mail, and the result is awaited.

Elections

Election procedures in the Society have been developed with care [1]. By the late 1960's, the growth in membership had made it so difficult to conduct elections by voting in person at the annual meetings that consideration was given to voting by mail. A committee under the chairmanship of Morton D. Miller considered the matter, and its 1970 report recommended that procedures for voting by mail be put into effect. The report was discussed [5] at Society meetings in 1971, and an addition to the By-Laws in the form of Article V on elections was approved at the 1971 annual meeting. Under the new procedures a preliminary ballot for President-Elect is mailed to the voting membership. The Elections Committee then uses the result of this ballot to determine the candidates for President-Elect whose names will appear on the final ballot, which also shows nominations for Vice-President, Secretary, Treasurer, Editor, and Board members. Preferential balloting is used in the election of President-Elect, Vice-President, and Board members.

For several years no member resident in Canada had been elected Vice-President. This led to the appointment in 1973 of the Committee on Representation by Region and Occupation, under the chairmanship of Richard Humphrys.

As demonstrated by the 1972, 1973, and 1974 elections, voting by mail appears to be a major improvement over the earlier procedures.

Vice-Presidents and Committees

During the 1960's there appeared to be some tendency toward an increase in the number of committees, with a concomitant overlap in their functions. In addition, there was some difficulty in communication between the committees and the Board.

On October 22, 1972, the Board approved an important proposal [51]

which had been placed before it by President-Elect Thomas P. Bowles, Jr. This proposal had two main purposes: to increase the participation of the membership in committee work and to give Vice-Presidents the responsibility of reviewing the work of groups of committees and of representing them at meetings of the Executive Committee and the Board. In accordance with this proposal, the *1973 Year Book* contained a new set of Guidelines for Appointments to Committees and an Organization Chart showing the relationships among Board, officers, and committees. Committees also were shown under five major groups, and some changes were made in terms of reference. A summary of committee activities [52] prepared in May, 1973, shows the diverse nature of committee work.

The experience of the last two years has demonstrated that the new organizational structure has brought about a major improvement in the coordination of the work of the Society.

Meetings

In the past decade there has been a notable improvement in the techniques of conducting meetings [1] and in the organizational skills of those planning and participating in them. Meeting formats have included workshop discussions, panel discussions conducted concurrently, combinations of papers and panel discussions, a panel discussion followed by a workshop on the same topic, introduction of nonmembers with special knowledge, and meetings devoted to a particular topic. For example, there have been special topic meetings on pensions (March, 1972), marketing (April, 1973), and health insurance (March, 1974). The Committee on Continuing Education and Research has provided the initiative for these special-purpose meetings.

The Canadian Institute of Actuaries held a two-day meeting in March, 1974, on the theme of inflation [55] and its relationship to the work of the actuary, and its June, 1974, annual meeting in Montreal was held jointly with the Society's later spring meeting.

The Society's 1974 annual meeting had the overall theme of professionalism, with particular regard to the history and the future of the actuarial profession.

Special Committees

In 1970 a group of younger members expressed concern that the Society was not providing enough opportunities for them to develop as professionals. Consequently, the Committee on Professional Development was formed, under the chairmanship of Paul Campbell, and its

report was rendered in 1971. Its activity encouraged the study of an actuarial foundation and coordination between the Research Committee and the Continuing Education Committee. The work of the committee is summarized by the chairman in a memorandum [53].

In 1973 the Joint Committee for an Actuarial Education and Research Foundation or Fund was formed. The purpose of this committee is to examine methods of undertaking and financing projects of basic and applied actuarial research. A preliminary report [61] outlines the early thinking

In 1974 approval was given for the establishment of both a bulletin service on job opportunities and a career consultation service under the auspices of the Society.

In 1973 the Committee on Valuation and Nonforfeiture Laws was established. This committee works closely with the National Association of Insurance Commissioners. A report will be submitted in the near future.

In 1972 a Committee on Literature was formed to examine means of encouraging preparation and distribution of actuarial literature and studies. Its report [54] was rendered in 1974. The committee recommended that a new publication be established, in paperback edition only, which would be distributed to the membership very shortly after each meeting. It would contain the Discussions at Concurrent Sessions and at Teaching Sessions, as well as other material of a temporary rather than of a permanent nature. The *Transactions* would continue to publish papers and discussions and other material of more permanent value. Another recommendation of the committee was that a Study Note service be introduced. Attached to the report was a list of the Study Notes then currently in use.

In February, 1973, the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary of the United States Senate, under the chairmanship of Senator Philip Hart, held hearings on the practices of life insurance companies. This led to the appointment of the Society of Actuaries Committee on Cost Comparison Methods and Related Issues, under the chairmanship of Bartley L. Munson. In June, 1973, the NAIC endorsed the report of its task force, which recommended three steps to be followed with regard to cost comparison methods and disclosure, and the undertaking of twelve research projects. The Society of Actuaries agreed to undertake three of the research projects on cost comparison methods and dividend philosophies, and subsequently these projects were referred to the new committee. This professional research on public questions which has been undertaken by the Society is of great significance, since it may lead to legislation and regulation as well as to some

public expression of opinion. Its significance is explained further in a letter [57] from the committee chairman and in the preliminary report of the committee [58].

This report of the Historian also records the great individual efforts and guidance given by Ernest J. Moorhead in many public studies and discussions of life insurance, with particular regard to his service as consultant to the Senate subcommittee and to the NAIC.

CONDUCT AND DISCIPLINE

Changes in the Society's Constitution that give further recognition to the need for high professional standards, and for the development of Guides to Professional Conduct and Opinions, have been recorded [1]. The introduction of Recommendations and Interpretations is referred to later in this report.

In the past few years there has been an increase in the number of disciplinary cases that have been brought before the Board. The most serious of these is that connected with the Equity Funding scandal. A decision is expected in 1975.

EDUCATION AND EXAMINATIONS

At its meeting on October 22, 1972, the Board approved a proposal [59] to restructure the Fellowship examinations. The basic Parts 6-8 and advanced Parts 9 and 10 would be replaced by four new examinations organized on functional lines. Tentatively the change will be introduced with the 1976 examinations. The Part 9 examination will be offered in both United States and Canadian versions.

A report on the progress of restructuring as well as other matters affecting the examination system in 1973 is contained in the Annual Report of the Education and Examination Committee [60].

Upon the recommendation of the Joint Committee on Review of Education and Examination, approval was given that, commencing January 1, 1973, the examinations of the Society of Actuaries and of the Casualty Actuarial Society should be jointly sponsored by these two bodies and by the American Academy of Actuaries, the Canadian Institute of Actuaries, the Conference of Actuaries in Public Practice, and the Fraternal Actuarial Association. Policy matters bearing on education and examination are kept under review by the latter bodies by means of liaison delegates who are appointed to the advisory committees of the two Societies.

The Joint Committee on Review of Education and Examination was formed in 1967 to review policy matters and make recommendations to

the governing bodies of the separate actuarial organizations [1]. This committee has concerned itself with methods by which the two central examination systems can be responsive to the needs of the actuarial bodies, particularly when actuaries are growing in number and are facing changes in their environment. The principal topics that the committee has studied have been the alternate route to the early examinations by accreditation of university courses; joint sponsorship of examinations; and extension of the common core of actuarial knowledge that exists between the examination systems of the two Societies. H. Raymond Strong and E. Sydney Jackson have been chairmen of the committee.

Important growth in educational activity has taken place in the area of continuing education. The 1967 Committee on the Future Course of the Society, under Chairman Walter Klem, recommended that a Committee on Continuing Education be formed. This was accomplished in 1968, with Charles L. Trowbridge as chairman. After a period of study, the committee submitted a report, commonly known as the Trowbridge report, which was the subject of a discussion at a Society meeting [6]. During these early stages important considerations were the definitions of areas of special interest and decisions in connection with objectives: furthering the search for suitable actuarial literature, encouraging the production of new actuarial literature, and the planning of meetings. The *1974 Year Book* shows that the name of the committee has been changed to Committee on Continuing Education and Research and that it is comprised of seven special committees. These committees play active roles in many ways, such as suggesting topics and specialized meetings to the Program Committee, assisting the Committee on Papers, arranging for articles to be published in *The Actuary*, and providing liaison whenever necessary.

RESEARCH

A formal Research Committee was appointed in 1964, and, as a result of the dedicated efforts of its members, actuarial research has become a flourishing activity. Beginning in 1966, annual research conferences have been held, jointly sponsored by the Society, the Casualty Actuarial Society, and other interested organizations. The scope of research activities is shown by a summary [62] of Research Committee plans in 1973 and by a recent discussion [7] at a Society meeting. In 1972 the informal research publication *ARCH (Actuarial Research Clearing House)* was established. Its purpose is to permit actuaries to communicate expeditiously with one another in the area of research.

Risk theory had come to be regarded as a specialized field of actuarial research in need of a special committee. Therefore, the Committee on

Theory of Risk was formed as a joint committee with the Casualty Actuarial Society. The first research conference in 1966 was devoted to risk theory. Application of such theory to problems of catastrophe reinsurance led to the 1971 conference. In the last two years the committee has assisted the American Academy of Actuaries Committee on Financial Reporting Principles by directing a study of the variations in actuarial reserves under GAAP.

LIFE INSURANCE COMPANY REPORTS UNDER GAAP

An extensive reading list [63] attests to the fact that this topic has received much attention from actuaries in the past few years.

United States

The first major step in the direction of GAAP accounting for life insurance companies was the issue of the 1970 exposure draft of the audit guide, "Audits of Life Insurance Companies," by the Committee on Insurance Accounting and Auditing of the American Institute of Certified Public Accountants. After discussion, the 1972 exposure draft "Audits of Stock Life Insurance Companies" was issued. The record of actuarial response to these drafts is recorded in the report of the Joint Actuarial Committee on Financial Reporting [63].

The third and definitive version of the audit guide, *Audits of Stock Life Insurance Companies*, was published in early 1973. It became necessary to apply new concepts to the calculation of actuarial reserves, and a description of the steps taken to accomplish this is given in a report to the American Risk and Insurance Association [64].

In effect, actuaries have responded to the statement of principles in the audit guide by developing a new concept for actuarial reserves, as described in an extract from a paper [8] by W. James D. Lewis:

As a direct result of the stimulus provided by the current discussions of financial statements a good deal of light has been shed on the nature of a life insurance operation and therefore on the theoretical actuarial foundation for policyowners' reserves. Of the greatest significance in this respect has been the concept of the life insurance operation as a special risk enterprise. This has led to the "Release from Risk Reserve System" published by the Joint Actuarial Committee in the U.S. in May, 1971 and by its author Richard Horn in his paper [9] to the 1971 Annual Meeting of the Society of Actuaries.

This concept of a special risk enterprise recognizes that a life insurance company, while facing all the usual business risks, also is in the business of assuming risk. When it offers a plan of insurance for a specified premium it does so on the basis of an expected level of mortality, interest, withdrawal, expense and taxation in the future. It also recognizes that the future experience

levels will vary from those expected at issue through statistical variability or through long term or cyclical trends and sets its premiums to make allowances for this variability. As the experience under the plan unfolds the company can release into earnings the differences between the provisions in the premiums for variability and actual variations experienced to date. The instrument for accomplishing this is the reserve and, specifically, the release from risk reserve system is based on this concept.

With the issue of the audit guide, actuaries found that guidance was needed with respect to principles, techniques, and professional conduct in the calculation of reserves under GAAP. Such guidance was given in two ways by the American Academy of Actuaries. First, its Professional Conduct Committee prepared an Opinion which serves as a broad guide to the actuary and which requires him to consider the Recommendations of its Committee on Financial Reporting Principles. Second, the latter committee prepared a number of Recommendations and Interpretations which describe the principles that should be followed. The letter [65] of March 21, 1973, from President Morton D. Miller describes the new procedure, and the report [66] of the Academy Committee on Financial Reporting Principles of the same date explains the work of the committee.

In the *1974 Year Book* of the American Academy the following appeared:

Opinion A-6: Actuarial Principles and Practices in Connection with Financial Reporting of Life Insurance Companies in the United States

Recommendation 1: Actuarial Methods and Assumptions for Use in Financial Statements of Stock Life Insurance Companies Prepared in Accordance with Generally Accepted Accounting Principles

Interpretation 1-A: Underlying Theory

Interpretation 1-B: Conservatism

Interpretation 1-C: Expenses

During 1974 these additional Recommendations and Interpretations were issued:

Recommendation 2: Relations with the Auditor

Interpretation 2-A: Relations with the Auditor

Recommendation 3: Actuarial Report and Statement of Actuarial Opinion

Interpretation 3-A: Illustrative Statements of Actuarial Opinion

Recommendation 4: Reinsurance Ceded by Life Insurance Companies

Recommendation 5: Recognition of Premiums

Clearly, the actuary's responsibilities with regard to the liabilities of a life insurance company have increased recently. A few years ago this responsibility was confined to the determination of actuarial reserves for

statutory statements. Since these reserves are defined quite explicitly, no great amount of actuarial judgment was required. Today the actuary is required to determine actuarial reserves which are appropriate for taxing authorities, and actuarial reserves which are consistent with GAAP for the published reports of stock life insurance companies. Considerable judgment is now needed for these tasks. There is no doubt that, through the development of Opinion A-6 and the Recommendations and Interpretations that flow from it, the Academy has taken a large step in the way of guidance to the actuary. However, the scope of these new instructions is large, and adjustments may be needed.

Canada

Thought has been given to the financial reporting of life companies in Canada also, but because of differences in the regulatory environment a different course is being followed. In Canada the actuary of the life insurance company is required by federal law to certify to the adequacy of the actuarial reserves in the annual statement filed with the federal government. In addition, these reserves must meet statutory standards that are more flexible than those in the United States.

Consideration of the problem comes from four quarters: actuaries, accountants, representatives of the life insurance business, and the regulatory authorities represented by the superintendent of the Federal Department of Insurance.

In 1973 the Canadian Institute of Chartered Accountants published its research study *Financial Reporting for Life Insurance Companies*. Many similarities and some differences exist between this report and the United States audit guide. It is significant that the research committee included one actuary (François J. F. Vachon) who rendered a minority opinion that was published separately in the report.

After considering the matter for more than a year, the Committee on Financial Reporting of the Canadian Institute of Actuaries in April, 1974, issued its report *Financial Reporting for Life Insurance Companies in Canada*. This comprehensive report investigates principles and is noteworthy for its analysis of the professional relationships between actuaries and accountants.

In May, 1974, the Committee on Life Insurance Accounting of the Canadian Life Insurance Association issued its special report *Financial Reporting for Life Insurance Companies* [70].

The Canadian superintendent of insurance has commented on the application of accounting principles to life insurance statements in several of his recent annual reports to the minister of finance [10].

The stage is now set for further discussions among these interested parties. As a result of their discussions, it is probable that changes will be made in statutory and public accounting practices and in the relationships between accountants and actuaries.

PRIVATE PENSIONS

In 1974, after several years of congressional debate, minimum standards for private pensions were enacted into law by the passage of the pension reform act. This very comprehensive piece of legislation contains provisions pertaining to eligibility, vesting, funding, actuarial reports, and termination insurance. As shown in a brief report from Walter L. Grace [67], actuaries played a large part in the preparation of this legislation.

Both accountants and actuaries will have enlarged responsibilities in the preparation and auditing of pension fund statements. Coordination between the two professions is being arranged through liaison committees which have been set up by both professions. A brief description of the workings of these committees and of the agenda for discussion, including pension fund statements and other topics, has been prepared by Frederick P. Sloat [68].

The international character of financial reporting on pensions and insurance is shown by the appointment of liaison representatives from the Institute of Actuaries, the Canadian Institute of Actuaries, and the Faculty of Actuaries to the Academy's Committee on Financial Reporting Principles and to its Committee on Actuarial Principles and Practices in Connection with Pension Plans.

The Academy Committee on Actuarial Principles and Practices in Connection with Pension Plans will develop Recommendations and Interpretations to guide actuaries in the preparation of reports on pension plans. During the last decade this task has received the attention of several committees of the various actuarial bodies. Therefore, a timely first step was taken by the Academy committee in 1974 in the issue of its "Exposure Draft Recommendation regarding Determination of Actuarial Present Values under Pension Plans."

In Canada provincial legislation on standards for private pension plans was enacted in the mid-1960's, and the content is quite similar to that of the United States pension reform act. In the last decade there has been a growing experience in the relations between government regulators and actuaries. The Pensions Committee of the Canadian Institute of Actuaries (Dudley Funnell and M. David R. Brown, Chairmen) has been an active one, in which a number of areas have been under study: actuarial principles, guidance for actuaries, the form of the actuary's certificate,

continuing surveys of actuarial assumptions, encouragement of papers, guides to conduct, and disciplinary procedures. Several of these topics have been discussed at recent meetings of the Canadian Institute.

GROWTH OF THE ACTUARIAL PROFESSION

Reference already has been made in this report to the widening activities of the other actuarial bodies. In this connection, the following miscellaneous items are submitted.

The Historical Background and the Presidential Address in the *1974 Year Book* of the Academy contain references to such topics as guides to conduct, accreditation, relations with accountants, the Council of Presidents, recommendations for reporting of insurance and pensions, and unification of the profession.

The Council of Presidents is the name that has been given to the informal periodic meetings of the presidents of the various actuarial bodies. The first meeting was held in December, 1972, at the request of Morton D. Miller, then president of the Academy. These meetings have proved to be helpful in coordinating the work of the governing councils in their consideration of matters of common interest.

The records being maintained by the American Academy are identified in correspondence [69].

The Canadian Institute of Actuaries completed an active year in 1974. President Robert C. Dowsett, in his address [50] to the annual meeting in June, referred to the following:

A brief on the role of the actuary under the Insurance Act in Quebec.

Canadian Institute of Actuaries report "Financial Reporting for Life Insurance Companies in Canada."

Promulgation of the form of an actuarial cost certificate for reports on pension plans.

Studies of disciplinary procedures.

Status of actuaries under the Quebec Professional Code.

Developmental work on the restructuring of Society examination Part 9 for the purpose of introducing Canadian material.

Presentation of papers.

Mr. Dowsett concluded his address with the hope that members of the Canadian Institute will respond to scientific developments in the profession, that the needs of different regions will be met, and that the international character of the profession will be maintained by strengthening the links between the Canadian Institute of Actuaries and the Society of Actuaries.

JOHN C. MAYNARD

APPENDIX I

HISTORICAL REFERENCES PUBLISHED IN
ACCESSIBLE FORM

1. VICTOR E. HENNINGSEN. "Society of Actuaries—Its First Twenty Years," *TSA*, XXI, 619.
 2. ROBERT B. MITCHELL. *From Actuarious to Actuary*. Prepared for the Twenty-fifth Anniversary of the Society of Actuaries. Chicago, Ill.: Society of Actuaries, 1974.
 3. THOMAS P. BOWLES, JR. Presidential address to the Society of Actuaries, *TSA*, XXV, 259.
 4. MORTON D. MILLER. Presidential address to the American Academy of Actuaries, *1974 Year Book* of the Academy.
 5. Discussions on Elections by Mail, *TSA*, XXIII, D41 and D235.
 6. Discussion on Continuing Education—Discussion of Trowbridge Report, *TSA*, XXII, D271.
 7. Discussion on Actuarial Research, *TSA*, XXV, D629.
 8. W. JAMES D. LEWIS. "Financial Reporting for Canadian Life Insurance Companies," *Proceedings of the Canadian Institute of Actuaries*, 1971–72.
 9. RICHARD G. HORN. "Life Insurance Earnings and the Release from Risk Policy Reserve System," *TSA*, XXIII, 391.
 10. *Annual Reports of the Superintendent of Insurance for Canada*, Vol. I: 1970, p. 38A; 1972, p. 39A; 1973, p. 38A.
- [11–49. Reserved for Future Reference Items.]

APPENDIX II

HISTORICAL REFERENCES NOT PUBLISHED IN
READILY ACCESSIBLE FORM

(Copies of these items are attached to the master copy of this report on file with the Society.)

50. ROBERT C. DOWSETT. Presidential address to the Canadian Institute of Actuaries, June, 1974.
51. Resolution on committee structure approved by the Society Board of Governors, October 22, 1972.
52. Summaries of committee activities and committee reports submitted to the Board of Governors, May 23, 1973.
53. Memorandum dated January 26, 1973, to members of the Committee on Professional Development.
54. First Report of the Advisory Committee on Means of Encouraging Preparation and Distribution of Actuarial Literature and Studies, 1974.
55. "The Challenges of Inflation." Booklet recording two addresses presented at the March, 1974, meeting of the Canadian Institute of Actuaries.
56. "Public Expression of Professional Opinion in the Society of Actuaries." Memorandum by Ernest J. Moorhead submitted to Fellows, June, 1970.

57. Letter from Bartley L. Munson dated July 29, 1974.
58. Preliminary Report of the Society of Actuaries Committee on Cost Comparison Methods and Related Issues, May 10, 1974.
59. Extract from Board minutes of October 22, 1972, with respect to examination restructuring.
60. Annual Report of the Education and Examination Committee to the Board of Governors, September, 1973.
61. Preliminary Report of the Special Committee to Analyze Objectives and Problems for an Actuarial Research Foundation, April, 1973.
62. Summary of plans of Committee on Research, 1973.
63. Reading List on Life Company Statements under GAAP, prepared by the Continuing Education Committee on Life and Health Corporate Affairs and submitted by Richard S. Robertson.
64. DALE R. GUSTAFSON. "Solving a Risk Theory Problem under Time Pressure (Life Insurance Adjusted Earnings)," *Journal of Risk and Insurance*, Vol. XLI (June, 1974).
65. Letter from President Morton D. Miller to members of the American Academy of Actuaries, March 21, 1973.
66. Report from American Academy of Actuaries Committee on Financial Reporting Principles to members of the American Academy of Actuaries, March 21, 1973.
67. WALTER L. GRACE. "Committee on Pensions Twice Coordinates Efforts of Several Actuarial Pension Committees," *Newsletter* (American Academy of Actuaries), June, 1974.
68. FREDERICK P. SLOAT. "Actuaries Enhance Relationship with Accountants," *Newsletter* (American Academy of Actuaries), June, 1974.
69. Memoranda by Walter S. Rugland dated July 22 and July 30, 1974. Description of American Academy files set up at the time of the Academy's formation, and proposed plan for maintenance of Academy archives.
70. *Financial Reporting for Life Insurance Companies*. Report of the Committee on Life Insurance Accounting of the Canadian Life Insurance Association, dated September, 1974.

REPORT OF THE HISTORIAN—1975

INTRODUCTION

THE first report of a Historian of the Society was written a year ago by John C. Maynard. Since it was the initial report, it covered events of historical importance from the mid-1960's through September, 1974. Although future reports will cover the Society year—from the conclusion of one annual meeting to the conclusion of the next—this Report covers the period from mid-September, 1974, through the 1975 annual meeting.

Providing a springboard for the Society's twenty-sixth year was the extremely successful twenty-fifth anniversary meeting, which took place in New Orleans, October 28–30, 1974. The theme of the meeting was "Professions and Professionalism," and the concurrent sessions, workshops, and teaching sessions, along with the many social events, are reported in Volume XXVI of the *Transactions*. Although there was an air, or special quality, about this meeting that can be known only to those of us fortunate enough to have been in New Orleans, the historical elements of the meeting will be available to future actuaries through the *Transactions*, through Robert Mitchell's book *From Actuarial to Actuary*, and from the 35-millimeter slide show of the Historical Exhibit.

The theme of professionalism which was initiated at the annual meeting continued throughout the year. The January, 1975, issue of *The Actuary* contained John C. Angle's discussion of John Bragg's paper "The Actuary as a Professional," and thoughtful letters on the subject from Laurence E. Coward and from Charles B. H. Watson followed in May and June. The President of the Society, upon the occasion of his visits to local actuarial clubs, emphasized the theme of the actuary as a professional.

As Mr. Maynard observed in last year's report, "the primary duties of a historian are to observe and selectively interpret, and the process is necessarily subjective." As this year's Historian, I have selected professionalism, in all its many guises, as the issue of the most importance and most deserving of attention in this year's report.

Views on "those actuarial events of the past year which you believe to be of lasting interest" were solicited from 120 members of the Society. There were 84 responses. The following events were mentioned by 10 or more respondents: the passage of the Employees Retirement Income

Security Act of 1974 (ERISA) and its many implications (53); the expulsion from the Society of two actuaries involved in the Equity Funding case (25); the requirement of the National Association of Insurance Commissioners that an actuary certify to the adequacy of life insurance company reserves (20); the Society's submission of two reports prepared by the Society Committee on Cost Comparison Methods to the NAIC (15); the decision of the Society to support an Actuarial Research and Education Fund (10); the publicity concerning the OASDI trust funds and the Society's establishment of a Committee on Social Insurance (10); and the possibility of further unification of the actuarial profession in Canada and the United States (10). Portions of many responses have been incorporated, with little change, into this report. Respondents who recognize their contributions will, I trust, keep in mind that "plagiarism is the highest form of compliment."

A profession is defined as "a calling requiring specialized knowledge and often long and intensive academic preparation." Therefore, it is most fitting to begin our review of actuarial events that have had an impact on the actuary as a professional with a summary of the Society's activities in educating and qualifying its members.

RECRUITMENT, BASIC EDUCATION AND EXAMINATIONS,
CONTINUING EDUCATION

Recruitment

During the past year the Committee to Encourage Interest in Actuarial Courses has developed a speaker's kit to be used in making presentations about our profession to students at the high-school level (*The Actuary*, May, 1975). The Minority and Disadvantaged Recruitment subcommittee continued to work with the Actuarial Summer Institutes at Lincoln University. The examination results of the 1974 Summer Institute students were the most successful to date (*The Actuary*, April, 1975). The J. Henry Smith Scholarship Fund was established, under the administration of the Society, to assist qualified female and minority actuarial students in the field of actuarial science. The probable need for additional actuaries was surveyed in a manpower study, which was presented as a discussion of Mr. Bragg's paper at the 1974 annual meeting.

Basic Education and Examinations

The Society's primary concern with pre-F.S.A. members and students is their actuarial education—examinations are only checkpoints that have been established to see how well the educational function is per-

forming. The years 1974–75 witnessed the usual revision of Study Notes and of specimen questions. Of particular note was the adoption of Stephen G. Kellison's new textbook, *Fundamentals of Numerical Analysis*, for the Part 3 syllabus. Parts 1, 2, and 3 are now jointly sponsored and administered by the Society and the Casualty Actuarial Society.

The restructuring of the Fellowship examinations, to commence in May, 1976, was an extremely significant event, at least to those of our members writing exams. Details of the revised syllabus, including transition arrangements, were provided in a special summer, 1975, supplement to *The Actuary*. The restructuring has given impetus to a major upgrading and updating of study material. For example, with the increased interest by the actuarial profession in investment philosophy, major revisions in the investment portion of the syllabus are being prepared.

The separating of the last Fellowship examination, Part 9, into Canadian and United States sections undoubtedly will have a significant long-range effect on the actuarial profession in North America. The Canadian Institute of Actuaries has proposed that from May, 1976, on the qualification requirements for F.C.I.A. designation include the passing of the Canadian option Part 9 for all F.S.A.'s who receive credit for Part 9 in 1976 or thereafter.

"Keeping up the standards" is of great importance to all members of the Society—seemingly more so after one has attained F.S.A. status. This concern with standards is the main reason why the proposal for an alternate route to Associateship has been gestating so long. The Ad Hoc Committee to Explore Details of the Alternate Route was appointed in 1971. The committee's assignment was to develop a detailed proposal of the alternate route structure for presentation to the Board of Governors. Their report was accepted by the Board at its October, 1974, meeting and referred to the Advisory Committee on Education and Examinations for consideration.

In a 1975 paper, "The Education of the Actuary in the Future," Anna Maria Rappaport and Peter W. Plumley review the present methods of providing actuarial education and suggest a significant expansion in the scope of education of actuaries.

Continuing Education

COMMITTEES

As reported by last year's Historian, the Society formed a Committee on Continuing Education in 1968. With the addition of the Committee on Social Insurance in 1975, there are now eight specialized committees

working in the field of continuing education. Particularly visible this past year was the work of the Committee on Retirement Plans in arranging for the special spring meeting on retirement plans, which was jointly sponsored by the Society and the Conference of Actuaries in Public Practice. Another Continuing Education Committee, the Committee on Research, played a leading role in the actuarial research conferences held at the University of California in September, 1974, on the subject of credibility, and at Brown University in August, 1975, on the subjects of computational probability and numerical analysis. The 1975 meeting was cosponsored by the Committee on Computer Science.

The Life and Health Corporate Affairs Committee has been particularly active, with the publication of four reading lists which cover the subjects "Life Insurance Company Financial Statements Prepared According to Generally Accepted Accounting Principles," "Federal Taxation of Life Insurance Companies in the U.S. and Canada," "Corporate Modeling and Operations Research," and "Statutory Accounting." The Committee on Economics and Finance has prepared a reading list that covers "Performance Measurement," "Inflation," and "Forecasting Rates of Returns." In addition, most of the Continuing Education Committees have sponsored articles in *The Actuary* and have reviewed published materials in their respective fields. During this past year the varied activities of these committees have become visible to the membership of the Society, and the committees contribute much to the professional knowledge of our members.

RESEARCH

In the opinion of a number of actuaries, the decision of the Board, at its October, 1974, meeting, to join with other actuarial groups in the establishment of the Actuarial Research and Education Fund will have a significant long-term impact on our profession. To quote one of my respondents, "Our response to the Foundation will be a fundamental determinant of the future course of our profession."

THE SOCIETY OF ACTUARIES—INTERNAL ORGANIZATION

Elections

As mentioned in last year's report, the fact that no member resident in Canada had been elected as a Vice-President for several years resulted in the appointment in 1973 of the Committee on Representation by Region and Occupation. This committee recommended to the Board that the Constitution of the Society be amended to ensure that at all times there be at least one Vice-President who was resident in Canada

when elected. In October, 1974, the Board deferred consideration of this recommendation until after the results of the 1974 election became known. With the election of John C. Maynard, a resident of Canada, to one of the vice-presidential positions, the Board decided that the committee recommendation need not be implemented. Further, the By-Laws of the Society were changed to ensure that the membership of the Committee on Elections be "reasonably representative of the geographical distribution and occupation interests of the membership." Previously, there were specific regional and occupational requirements in the By-Laws. The Special Committee on the Society Election Process is continuing to study the entire election process.

Conduct and Discipline

During the past year fewer than ten cases of alleged unprofessional conduct have been brought before the Board. All but one of these cases were resolved at the Investigating Committee level, either with the finding that there was no substance to the charge or with the assurance of the offending party that the objectionable practices that led to the complaint would be corrected.

The obvious exception was the Equity Funding case, which involved two Fellows of the Society. Soon after the news of the Equity Funding scandal broke in early 1973, the Board authorized the appointment of "a committee to investigate into questions relating to members of the Society arising in connection with the Equity Funding Life case."

The Investigating Committee reported to the Board at its September, 1973, meeting. In accordance with the Constitution of the Society, a Prosecuting Committee and Disciplinary Board were then appointed. In addition, letters were sent to the two Fellows under investigation informing them that the Society was considering the matter of their possible unprofessional conduct.

During this period, pressure had grown among the general membership of the Society for some indication that their elected Board was taking appropriate action against unprofessional acts that apparently were of such a serious nature. However, the Constitution of the Society requires that all disciplinary proceedings "be deemed confidential and kept secret," and that the membership is to be notified of Board action only if suspension or expulsion of a member is ordered and, even then, not until the period for appeal has expired. That the Board was aware of the members' impatience was indicated at its March, 1974, meeting when it requested that the Executive Committee consider appointing "a Committee to study the problem of how to notify Society members

that the Society is carrying out its duties with respect to complaint cases." It was noted that, as a result of the Board's strict secrecy on disciplinary cases, members may be unaware of the Board's efforts to maintain professional discipline. At its June, 1974, meeting the Executive Committee directed the President to appoint a committee to study this problem. Meanwhile, although guilty pleas to criminal charges had been entered by the two Fellows, formal court proceedings would be completed only upon sentencing. The United States attorney in charge of the case had requested the Society to defer disciplinary action until sentence had been passed.

At its October, 1974, meeting the Board, in response to continued questions and concern from the members, approved a report to the membership that recognized that guilty pleas had been entered by the two members, that gave reasons why no additional action should be taken until sentencing was complete (expected in February, 1975, but later postponed to March), and that reminded members of the requirements of the Society's Constitution for confidentiality of proceedings.

The Disciplinary Committee presented its findings to the Board on April 16, and, after a review of the findings, the Board found that misconduct had occurred and ordered the expulsion from membership in the Society of both James C. Smith, Jr., and Arthur S. Lewis. The period for appeal expired on May 22, 1975, at which time the expulsion became final. The expulsion was reported to the membership in early June.

The Equity Funding case was a landmark in the history of the Society—it was the first case of expulsion from membership because of conduct detrimental to the actuarial profession. However, because it involved admitted criminal acts, it was more a test of the Society's disciplinary procedures than a test of the Society's enforcing standards of professional conduct. Perhaps we should be thankful that such a clear-cut case, involving felonies, came first. Thus members of the Board and the general membership have been made more fully aware of the implications, including some of the problems, of Article VII of our Constitution.

In October, 1975, the Board approved the appointment of a Standing Committee on Complaints and Discipline. This committee will be responsible for performing the functions which may, under Article VII, be delegated by the Board.

Dues

At its April meeting the Board approved an increase in the dues schedule. The basic increase was \$15 for all membership categories,

except for overseas members, whose dues were increased by \$40. In addition, members who have been F.S.A.'s for less than five years will no longer be entitled to a \$25 reduction in dues. The new dues schedule more closely reflects the estimated costs of serving each class.

Executive Director

In April, 1975, Gary N. See resigned his position as Executive Director of the Society. He was replaced in this position by Peter W. Plumley, formerly general chairman of the Education and Examination Committee.

GROWING PROFESSIONALISM

As mentioned earlier, the dictionary defines a profession as "a calling requiring specialized knowledge," and we have noted how our educational activities support our profession by providing "specialized knowledge." The same dictionary defines professional as "characterized by or conforming to the technical or ethical standards of a profession," and we have shown how the Society has moved to enforce conformity with our ethical standards. Society activities that foster conformity with technical standards will be dealt with later in this report. Meanwhile, what are some of the other aspects of our growing professionalism?

Responsibilities

The actuarial profession—like all other professions—has a responsibility to the public. Guide 1(a) of the Society's Guides to Professional Conduct states: "The member will act in a manner to uphold the dignity of the actuarial profession and to fulfill its responsibility to the public." William A. Halvorson discussed the nature of this responsibility before the Atlanta Actuarial Club in October, 1974. As reported in *The Actuary* (December, 1974), he recommended that the Joint Committee on Professional Conduct "more clearly define our profession's collective responsibility to the public."

In this respect both the United Kingdom and Canada appear to be leading the way. From the United Kingdom there is an article, "Bolting the Stable Door," in *The Economist* (May 31, 1975), as well as a memo of the Institute of Actuaries and the Faculty of Actuaries, "Actuaries and Long-Term Insurance Business." In Canada there is a proposed regulation that the actuary responsible for the valuation of a life insurance company be designated by, and directly responsible to, the board of directors, and any change in the designation be reported to the superintendent of insurance.

Independence

At the heart of the question of "professionalism" is the matter of "independence." For this reason, the Joint Committee on Independence was established in early 1974 "to draft a position paper and a set of guidelines on the circumstances, if any, in which organizational and financial independence of the actuary are desirable to avoid what may appear to be a conflict of interest in certification and other actuarial duties." The first draft of the report of the joint committee was submitted to the members of the six sponsoring actuarial organizations in September, 1974, and was discussed in a concurrent session at the New Orleans meeting. A second draft will be sent to Society members in late 1975. The committee has determined that independence cannot be satisfactorily defined and that therefore emphasis should be placed on professionalism and disclosure. Consequently, the committee believes that no definition of actuarial independence and no guidelines as to when such independence will be necessary are required.

DEVELOPMENT OF ACTUARIAL PRINCIPLES

What are the "technical standards" of the actuarial profession to which an actuary must conform in order to be a "professional?" The Society's Guides to Professional Conduct deal only with precepts and principles, as is true of codes of ethics generally. "Opinions as to Professional Conduct" are interpretations of the Guides, but they do not contain statements of technical actuarial principles or practices.

The closest the Society now comes to specifying principles is in Opinion S-6, which covers financial reporting for life insurance companies in the United States. Paragraph 7 requires that the actuary "take into consideration the published final recommendations of the Committee on Financial Reporting Principles of the American Academy of Actuaries." The Recommendations of this Academy committee do contain specific guidelines as to how assumptions are to be selected and employed. Actuaries who choose not to follow the Recommendations must be prepared to support their deviations.

There has been a growing demand for similar requirements in the pension area. A major contributor to this demand was the city of Sacramento pension plan controversy. In early 1974 the assistant city manager of Sacramento, California, wrote letters to the Academy and the Society, in which he questioned the seemingly irreconcilable differences in actuarial assumptions used by different actuarial firms with respect to the funding of the city's retirement system. Near the end of his letter he stated: "This situation is so serious and has such great implications

that some positive comment by your professional organization is essential if there is to be any reasonable confidence placed in consulting actuaries.”

After an investigation under the auspices of both the Academy and the Society, certain funding questions, including some in reference to the effects of inflation, were referred to the Academy Committee on Principles and Practices in Connection with Pension Plans. In a draft Recommendation this committee determined that the probable effects of inflation should be considered in actuarial statements with regard to pension plan funding. The city of Sacramento pension plan controversy is an example of the pressures on the actuarial profession to move toward making more explicit its technical principles and practices, even if the result is a lessening of desirable flexibility.

Regardless of whether one accepts the desirability of specifying actuarial principles and practices, this development will undoubtedly have far-reaching effects on the actuarial profession. To be regarded as a profession, it is necessary to have standards, both technical and ethical, that can be referred to an against which the performance of those who would label themselves as professionals in the field can be judged.

PUBLIC RECOGNITION OF THE ACTUARIAL PROFESSION

Under this major heading are discussed a number of actuarial “events” whose historical importance might be measured in terms of the effect they have had on the growing visibility of the actuarial profession to broader publics. Some of these events would be deserving of review in the report apart from their impact on the public, but it is from the public awareness and exposure viewpoints that they are covered here.

ERISA

In one way or another, the passage of ERISA and attendant activities apparently is considered by actuaries to be the most significant single event during the past year. ERISA certainly has had a significant effect on the pension business, and therefore it undoubtedly has touched the business lives of all actuaries working in the pension field. However, its effect on the pension business itself, no matter how great, would not qualify ERISA as a significant *actuarial* event. From the professional viewpoint, interest centers not so much on what ERISA did in the way of requiring changes in plan design or funding methods but rather on the effect it will have on the responsibilities of the actuary involved with a pension plan. Also of professional interest are the provisions of ERISA that concern the definition and qualifications of

enrolled actuaries and the effect of ERISA on the public awareness of, and attitude toward, the actuarial profession.

The questions of fiduciary responsibility and of the proper actuarial assumptions to be used in the valuation of pension plans must now be resolved by each and every actuary involved with a pension or employee benefit plan. The actuary is accountable not only to the plan holder but also to the plan participants. Actuaries may now be called upon to defend every decision that affects the operations or the costing of an employee benefit plan.

This need to defend decisions will provide further impetus for the specification of actuarial principles and practices in connection with pension plans. The drive may well extend to the selection of certain principles or practices as being preferable to others—the selection often being made more on the basis of required conformity than on that of the clear superiority of one approach over another.

For most actuaries outside the pension field, the main concern with ERISA has been the definition of qualified, or enrolled, actuaries. At the time of writing this report, the regulations proposed by the Joint Board on Enrollment of Actuaries under ERISA effectively deem certain classes of membership in several named actuarial organizations as equivalent to specified degrees involving actuarial mathematics, or to passing an examination given by the joint board. The named actuarial organizations are the American Academy of Actuaries, the Society of Actuaries, the Conference of Actuaries in Public Practice, and the American Society of Pension Actuaries. However, membership within one of these organizations must have been obtained by proctored examination.

NAIC Requirement of Actuarial Certification of Life Insurance Company Reserves

In January, 1975, the NAIC sent a specific proposal for an actuarial certification of life insurance company reserves to the presidents of the Academy and the Society. The most controversial part of the proposal was that the actuary certify that the reserves and other actuarial items “make a good and sufficient provision for all unmatured obligations of the company guaranteed under the terms of its policies.” An Academy committee was assigned the task of responding to the NAIC’s proposal.

At NAIC meetings in both April and June, the chairman of the Academy committee expressed support for the concept of actuarial certification but recommended that action be deferred until the necessary study and analysis could be completed as regards the “good and

sufficient provision” aspect. At their meeting in June the NAIC Blanks Subcommittee accepted most of the revisions suggested by the Academy but did reaffirm application of the proposed requirement, including “good and sufficient provision,” to 1975 statutory annual statements.

What is the significance to the profession, first, of the actuarial certification requirement and, second, of the “good and sufficient provision” clause? Undoubtedly, the effect of the requirement, in toto, will be positive. The certification places much more responsibility on the actuary or, at least, makes that responsibility more visible.

In the past, actuaries in the United States, as contrasted to Canada and Great Britain, have certified only that reserves are not less than those required by law. Some actuaries believe that if reserves are greater than statutory minimums, they, by definition, make “good and sufficient provisions.” Others—probably most—believe that the certification imposes a possibly higher level of reserving and that the actuary must satisfy himself, independent of statutory requirements, that the reserves make “good and sufficient provision.” Practicing actuaries are looking to the profession for some guidance as to the appropriate degree of conservatism that should be employed in making such tests. It was to allow time in which to develop such guidelines that the Academy committee requested the NAIC to defer the requirement for a year.

Cost Comparison Methods

One of the more visible involvements of the Society in “outside” affairs has been the work of the Special Committee on Cost Comparison Methods and Related Issues (Munson committee). The background for the appointment of this committee was given in last year’s Report of the Historian.

Two reports, “Analysis of Life Insurance Cost Comparison Index Methods” (202 pp.) and “Philosophies in the Computation and Dissemination of Dividend Illustration” (87 pp.) were presented by the committee to the Board of Governors. At its October, 1974, meeting the Board accepted the reports and approved them for release to the public and to the NAIC, with the understanding that the reports could be regarded as public expressions of professional opinion by that committee.

There is little question that the Society’s efforts in the area of cost comparisons will be influential. With that in mind, should we have stated a preference for one method over all others? Some actuaries believe that we should have done so. It is reported that participants in the concurrent session on this topic in New Orleans favored stating

a preference. Knowledgeable members hold opposing views on the relative superiority of the two families of methods. Those supporting the "average" methods are perhaps more vociferous in their demands for a Society expression of preference, but it is possible that the supporters of "snapshot" methods are less vocal, since, in the absence of a strong Society statement, the NAIC is likely to continue its support for the "interest-adjusted" method, which is of the "snapshot" family.

Public Expressions of Opinion

In mid-1974 Fellows of the Society were asked to decide, by mail ballot, whether the Constitution should be amended to provide for the continuation of Article X (Public Expression of Professional Opinion) on a permanent basis. Valid ballots were returned by 69 per cent of the Fellows (25 per cent required) and 92 per cent of these ballots were cast in favor of the amendment.

In *The Actuary* (January, 1975) President Charles L. Trowbridge raised the question as to whether there are issues on which the Society should speak. Social security and life insurance cost comparisons were suggested as two possible issues. "On public controversy involving actuarial principles we need to stand up and be counted. How can we do this best?" President Trowbridge asked for comments on these views. The April issue carried the responses of four actuaries, all of whom supported a public expression of professional opinion on aspects of the United States social insurance programs. To date, however, no professional opinion has been expressed publicly by the Society.

Social Insurance

The work of the actuary in social insurance has always been quite visible. During the past year considerable news media time and space have been devoted to actuaries' pronouncements and findings concerning social security. This heightened interest has been caused primarily by questions raised as to the basic soundness of the United States social security system. The Society's response has been to appoint a new Continuing Education and Research Committee on Social Insurance.

Nonforfeiture and Valuation

Another significant interface with regulatory authorities lies in the nonforfeiture and valuation areas. In January, 1973, the Board appointed a Special Committee to Study the Valuation and Nonforfeiture Laws, Regulations, and Practices. The committee concentrated its initial efforts on the Standard Nonforfeiture Laws and presented its

“Report on Actuarial Principles and Practical Problems with Regard to Nonforfeiture Requirements” in September, 1975. The report concluded that the basic structure of the current nonforfeiture laws should be retained but that the calculation of expense allowances could be simplified. The present linkage between the valuation and nonforfeiture interest rates would be eliminated. A retrospective approach is proposed for deferred annuities and a nonstatutory approach for completely “open” and other experimental policies.

Of more importance to the profession, as opposed to the industry, is the relationship of the activities of this committee and those of the Society to the NAIC's efforts in the same area. Primarily at the instigation of John Montgomery, a Fellow and Actuary of the California Department of Insurance, the NAIC at its December, 1973, meeting appointed a Nonforfeiture Value and Policy Reserve Valuation Task Force of the C-3 Life Subcommittee. This task force, chaired by Mr. Montgomery, consisted of insurance department actuaries. A General Advisory Committee, composed of five actuaries representing the Society, the Academy, the academic community, the ALIA, and NALC, was formed to aid the task force. Since the Society committee had been concerning itself primarily with the nonforfeiture area and recommendations were expected soon, the task force decided to concentrate on the valuation side.

At the October, 1974, Board meeting, considerable discussion ensued as to just how the Society might coordinate its activities with those of the NAIC. The Board decided (1) that a committee would be appointed to represent the Society in any study of valuation matters; (2) that the members of this committee would be recommended to the NAIC to serve as members of the appropriate NAIC advisory group; and (3) that this new committee would be responsible to report on its activities to the Board. The charge to the existing Society committee was revised to be consistent with the charge to the new committee. This meant that the existing committee would restrict its efforts to the nonforfeiture area. Unfortunately, the NAIC felt that they could not accept such an organizational structure, and thus the Committee on Valuation has never been formed.

The NAIC task force, now reconstituted as the (C3) Life Technical Subcommittee on Valuation and Nonforfeiture Value Legislation, requested the participation of the Academy in setting up technical task forces to assist the subcommittee. The five-man General Advisory Committee to the original task force has been disbanded.

At present, technical task forces, composed mainly of Society members, are proceeding with the valuation area tests and studies that were assigned to them by the NAIC subcommittee. Also, the subcommittee has submitted a set of questions to the Society "which require the professional technical consideration of the Society." After reviewing the Society's previously mentioned committee report, the NAIC expects to formulate further questions with regard to nonforfeiture value regulation.

One element that has surfaced in the nonforfeiture-valuation area is deserving of mention in a history of the Society. Some regulators seemingly do not recognize the Society as being completely independent of the companies that employ Society members. Unfortunately, there is a tendency to include representatives of the Society with representatives of trade organizations, such as the ALIA and the NALC, on so-called industry advisory committees.

Other Involvement with Governments

Actuaries interface with government authorities in many other areas. One of the most significant is that which concerns the numerous questions that have arisen with respect to antidiscrimination. Included in this category are the provision of equal benefits to women, unisex tables for pension plan purposes, and the requirement to prove that any additional life insurance rating has a sound statistical base. These are only examples. Very probably, some Historian of the future will comment on one or more of them in some detail. However, the problems presented and the profession's response to the problems are too recent to enable this year's Historian to place them in perspective.

Each reader may judge for himself the degree to which the public is aware of our profession. However, we must ask ourselves, as the Public Relations Committee has done, just how important public awareness is. Certain groups, such as legislators and regulators, are more important than others. Gaining of public recognition is slow, but there is evidence of advances in the past year—ERISA, actuarial certification of life company reserves, cost comparisons, and social insurance.

GENERAL-PURPOSE FINANCIAL REPORTING

Last year's Historian devoted considerably more space to the subject of life insurance company reports under generally accepted accounting principles than to any other. Since his report covered many years, including the period 1970-74, when this subject was one of the most significant facing the profession, such concentration was justified. Inas-

much as the subject already has been placed in historical perspective, all that is required this year is a brief update.

In the United States, perhaps the most significant event was the completion of the life insurance company model under the direction of the Joint Committee on the Theory of Risk. The development of this model was financed by the Society at a cost of \$40,000–\$50,000. The model will be employed by the committee to develop guidelines that will provide for adverse deviations in GAAP reserve assumptions, and it will be available to individual companies through a time-sharing network.

In Canada significant developments in general-purpose financial reporting have continued to occur this past year. Earlier developments included the publication of the Canadian Institute of Chartered Accountants' Research Study "Financial Reporting for Life Insurance Companies" in 1973 and reports by the CIA and the Canadian Life Insurance Association in 1974.

In May, 1975, the Canadian Department of Insurance published a memorandum concerning financial reporting for life insurance companies. This memorandum contains a number of proposals on actuarial reserves and acquisition expenses, actuary's opinion, auditor's opinion, valuation of assets, nonadmitted assets, and consolidation of statements. Since the memorandum is in the form of a study paper, upon which considerable research must be done, it would not be worthwhile to detail its proposals here. However, there is one very important proposal, going directly to the heart of the question of professionalism and independence, that is unlikely to be changed and should be noted.

Present Canadian law applicable to life company financial statements requires that actuarial reserves be certified by a Fellow of the Institute. The Department of Insurance has proposed that, in any future legislative changes, the main responsibility for the calculation and certification of the adequacy and the appropriateness of actuarial reserves should rest upon a qualified actuary, who need not be independent of the company. It then would be acceptable for regulatory purposes if the auditor's report indicated that the auditor had accepted the reserves as certified by the actuary. It has been further proposed that the company's board of directors designate the actuary responsible for the valuation and inform the superintendent of insurance if there is any change in such designation.

Unquestionably, the trend of events in Canada, as reported above, will result in greater responsibilities for the actuary and greater recognition of the actuary as a professional.

STRAWS IN THE WIND

In this last section brief mention is made of two issues that some actuaries believe to be of great potential importance to our profession. Since this is a history of the Society, it would be easy to dismiss the first issue, the malpractice insurance crisis, as applying to “those other guys” —our CAS brethren. However, as one observer points out, “The public does not recognize that ours is a bifurcated profession and, if they did, it would not be of great moment to them. Actuaries are known to have something to do with rates and reserves, and it is these two areas that are obviously askew in malpractice insurance.” Future Historians will be able to assess whether the current malpractice crisis has had any lasting effect on the Society and its members.

The second very significant issue of the past year has been the high degree of inflation that has been experienced. Indeed, the spring regional meetings of the Society focused on this problem. The effects of inflation have affected the work of actuaries in the areas of social security, pension plan principles, investment portfolios, and other areas too numerous to mention.

GARY CORBETT

**REPORT ON ACTUARIAL PRINCIPLES AND
PRACTICAL PROBLEMS WITH REGARD
TO NONFORFEITURE REQUIREMENTS**

To: Board of Governors of the Society of Actuaries

From: Special Committee on Valuation and Nonforfeiture Laws

The assignment to this committee grew out of Society meetings at which valuation and nonforfeiture legislation was discussed. By far most of the discussions centered on the problems of the Standard Nonforfeiture Law. For this reason the committee began with questions of nonforfeiture.

Subsequently the attention of the profession focused more on questions of valuation with emphasis on valuation of assets, cash flow, and solvency. We have recommended to the Board that these latter questions be undertaken by a different group in close liaison with the committees appointed by the NAIC to study the same subjects.

The committee's report on nonforfeiture is submitted herewith. The subject is a broad one, and we have dealt with what appeared to us to be the more important aspects. As long as it is, the report nevertheless omits much numerical detail. Similarly, it does not include much in the way of comment on unusual plans which the committee has analyzed. We would be pleased to discuss these additional studies and to make them available to whoever would be interested.

The committee members devoted considerable time to this project, with near perfect attendance at our bimonthly meetings. Furthermore, there were no substantial disagreements, and every member endorses the final report. It thus meets the criteria of Article X of the Constitution of the Society as an expression of opinion of our committee. In accordance with that Article, we state that the report does not purport to represent the views of the Board or the Society.

In addition to acknowledging the committee's efforts, I wish to make known to the Board the fine efforts and contributions by the following actuaries who were not members of our committee:

John E. Aschenbrenner
Bennie W. Baucom
John K. Booth
G. Scott Bucher
Stephen H. Frankel
Lowell H. Lamb
Richard V. Minck
Jerrold R. Scher

Respectfully submitted,
HENRY C. UNRUH, *Chairman*

Special Committee on Valuation and Nonforfeiture Laws

THOMAS F. EASON
CHARLES GREELEY, *Secretary*
DALE R. GUSTAFSON
ROBERT N. HOUSER
WILLIAM K. NICOL
ROBERT L. PAWELKO
ALAN RICHARDS
JOHN R. GARDNER, *Vice-Chairman*
ARDIAN C. GILL, *Vice-Chairman*

October, 1975

TABLE OF CONTENTS

Chapter	Page
I. <i>Summary of Conclusions</i>	555
II. <i>Equities</i> —Different points of view, a relative affair	558
III. <i>Comparison of Systems</i> —The British, Canadian, and United States systems of nonforfeiture and valuation are compared	559
IV. <i>Unexplored Territory</i> —General observations on regulatory approaches that were not explored by the committee	560
V. <i>The Committee's Perspective</i> —The committee's viewpoint, items identified as needing study	561
VI. <i>The Current System: The NAIC Study</i> (Guertin Report)—its underlying concepts, its conclusions	562
VII. <i>Comments on the Current System</i> —Relationship to net premiums, expense allowance conceptually, need for pragmatism, only minimum values regulated, cash values only one part of pricing structure, reaffirmation of Standard Nonforfeiture Law concepts, committee's approach to the study	564
VIII. <i>Examination of the Relationship between Current Minimum Values and Gross Premiums</i> —Components of the level gross premium, gross premiums and asset shares, marketplace influence, need for adjusted premium factors close to experience	566
IX. <i>Formula Simplification</i> —Nature of the adjusted premium, complexity demonstrated, simplification from using net premiums for percentage allowances, numerical effect	568
X. <i>Level of Expense Allowances</i> —Relationship between regulation and competition, variations by company, Canadian Formula 70, proposed "test" expense factors, need for overall test of values, the effect of inflation, costs affecting nonforfeiture allowances, their susceptibility to inflation, conclusion to ignore inflation	570
XI. <i>Standard Plans Other than Whole Life</i> —Nature of excess first-year expenses, commission dominant factor in plan variations, a proposed test formula, need for a limit on adjusted premiums examined	575
XII. <i>Products with Variations after Issue</i>	576
A. Fully defined products	
1. Varying death benefits, ten-year averaging proposed	
2. Varying gross premiums, leveling proposed, adjustment proposed if gross premiums vary by size	
B. Products with future changes undetermined at issue	
1. Multitrack policies, values varying by track, automatic track values proposed at issue, change in track examined, new modified expense allowances proposed	

Chapter	Page
2. Open policies, life-cycle or indexed examples, alternate routes examined, with new expense allowances proposed, most open policy discussed, approval mechanism suggested	
XIII. <i>Interest and Mortality</i> —4½ per cent considered, modern mortality considered, current versus new minimum, question of mortality margins, separate male/female tables considered, substandard business considered	585
XIV. <i>Trivial Values, Term Insurance, Supplemental Benefits, Severability</i> —Trivial-values test, extension of term exemption proposed, severability of supplemental benefits, deposit term and deposit whole life	592
XV. <i>Single Interest Minimum, Paid-up, Single Premium Life</i> —Single nonforfeiture interest rate proposed for minimum cash values of all plans except single premium; nonforfeiture options, interest, mortality, and expense considered; mathematical equivalence discussed; nonparticipating paid-up additions proposed; some exemptions needed for tables of extended term and paid-up; higher interest basis proposed on single premium life	597
XVI. <i>Annuities</i> —Benefit period analyzed—nonforfeiture values inappropriate, accumulation period values, percentage of gross deposit method proposed, flexible contracts examined	602
XVII. <i>Accident and Health Insurance</i> —Guidelines from life insurance applied, emergence of nontrivial values, problems if values required, recommendation against mandating values, exception noted for return of premium products	605
XVIII. <i>Miscellaneous Items</i>	608

LIST OF APPENDIXES

	Page
A. Recommendations of NAIC Committee to Study Nonforfeiture Benefits and Related Matters (1941)	609
B. Four General Approaches to Percentage of Premium Factors for Plans Other than Whole Life	611
C. Equivalent Level Amount—Ten-Year-Limit Effect	613
D. Comparison of Minimum Values—Current Expense Allowance and Test Expense Allowance	614
E. Comparison of Minimum Values— $3\frac{1}{2}$ versus $4\frac{1}{2}$ Per Cent	617
F. Comparison of Minimum Values—1958 CSO versus Modern CSO	620
G. Summary of Comparison of Minimum Values—Current versus Test (That Is, Modern Expense Allowance, $4\frac{1}{2}$ Per Cent, Modern CSO)	623
H. Comparison of Mortality Rates—1958 CSO versus Modern CSO	624
I. Comparison of Margins—1958 CSO versus Modern CSO	625
J. Comparison of Minimum Values—Modern CSO versus Modern Basic	626
K. Comparison of Mortality Rates—Male and Female versus Combined	629
L. Comparison of Minimum Values—Separate Male and Female Tables	630
M. Comparison of Minimum Values—Three-Year and Six-Year Setbacks	631
N. Test of Deposit Term	632

I. SUMMARY OF CONCLUSIONS

THE Board of Governors gave the committee the following assignment: (1) To study in depth the underlying actuarial principles involved in, and the practical problems which arise in the application of those principles to, current regulations and practices with regard to valuation and nonforfeiture requirements and (2) to develop a report on its findings. This is our report on the subject of nonforfeiture requirements.

In principle the subjects of nonforfeiture and valuation are severable. Valuation is a matter of company solvency, while nonforfeiture is a matter of equity among classes of policyholders. We recognize that a change in valuation methods could force a removal of or a drastic change in nonforfeiture guarantees. Nevertheless, we have assumed that nonforfeiture values would continue generally in their present form and have prepared our report within the context of the current valuation and nonforfeiture systems.

The report falls into three parts. The first deals with generalities, history, and fundamentals of nonforfeiture benefits. Beginning with Chapter IX, the report grows more technical, dealing with expense allowances, mortality and interest assumptions, and technical problems with the current laws. It concludes with appendixes containing numerical or very technical data.

At the risk of being unfair to the exposition and development of our reasoning, the following summarizes our considerations and conclusions:

1. The adjusted premium method in the current nonforfeiture law has worked reasonably well, and its basic structure should be retained (p. 566).
2. The formula for adjusted premiums could be simplified by basing expense allowances on net premiums (rather than adjusted premiums) (p. 568).
3. Any updating of the expense allowance would probably involve decreasing the per \$1,000 component and increasing the percentage of premium component. The need to update expense allowances does not appear to be urgent. Specific formulas for test purposes were chosen and the resulting calculations shown (pp. 572-73).
4. The effect of inflation on the expense allowances does not appear to be substantial (p. 574).
5. Equivalent level insurance amounts should not reflect amount changes after the tenth policy year (p. 576).

6. Expense allowances should be based on levelized net premiums rather than the first adjusted premium (p. 577).
7. If premiums grade by size, anomalies occur due to the uniform percentage of gross premium requirements; these can be largely removed (p. 578).
8. On multiple track policies, the automatic track should be used for nonforfeiture compliance, and changes after issue under specified policy options should be ignored unless and until they are exercised (p. 579).
9. Life-cycle and many open policies can be accommodated in a new law in a manner similar to multiple track policies. Completely undefined policies cannot be so accommodated; however, they should be freely permitted. Regulators should be given broad powers to approve experimental designs (pp. 582-83).
10. A single national review body would facilitate approval, particularly of complex policies, and would promote flexibility of product design while decreasing risk of abuse (pp. 584-85).
11. No recommendations on specific interest rates are made. Test calculations are made using a $4\frac{1}{2}$ per cent rate to show the magnitude of the decrease in cash values from $3\frac{1}{2}$ per cent values. See also item 21 below (p. 586).
12. No recommendations as to modernizing the 1958 CSO Mortality Table are made. However, a "Modern CSO" table is developed for test purposes, and the resulting calculations show in general a decrease in cash values of a magnitude somewhat lower than the effect of a 1 per cent increase in interest rate (p. 587).
13. There are some good reasons that the mortality table for nonforfeiture benefits should continue to contain margins (p. 589).
14. A six-year age setback for determining whole life cash values for females would reasonably approximate the results using a separate female table (p. 590).
15. Certain additional considerations are discussed in the mortality area, principally a more flexible treatment for substandard policies (p. 591).
16. Policies that never give rise to significant values should be exempted; a specific test for triviality is proposed (p. 592).
17. Term exemptions from cash-value requirements should be extended (p. 593).
18. Term riders as defined should be treated as separate policies under a "severability" principle (p. 594).
19. Renewable and convertible term policies should be viewed uniformly as a series of short-term policies for nonforfeiture purposes (p. 595).

20. Proposed treatment of deposit term and deposit whole life is discussed (p. 596).
21. A single interest rate for statutory minimum cash values is proposed. This eliminates present linkage with the valuation and the policy cash-value rates (p. 597).
22. Guaranteed paid-up insurance options should be those purchased by the cash value on any interest rate at least as high as that used for cash values (p. 598).
23. The cash-value mortality table should be used for determining guaranteed paid-up values, except that extended term should employ higher mortality (p. 599).
24. Specific expense loadings in paid-up insurance option guarantees are not recommended (p. 599).
25. Substitute (nonparticipating) purchase bases granting larger than guaranteed amounts should be permitted for insurance options and paid-up additions (p. 600).
26. Complete exposition of nonforfeiture values in a policy table should not be required for multitrack policies or "open" plans (p. 601).
27. Single premium life minimum cash values should be based on higher interest rates than annual premium policies (p. 602).
28. Deferred annuities should be subject to minimum-cash-value requirements during the buildup period; an accumulation of percentages of premiums (after exclusions) is proposed; flexible contracts pose special problems (pp. 602-5).
29. Nonforfeiture values should not be required for accident and health insurance, with the possible exception of contracts with a return of premium provision (p. 607).
30. Various miscellaneous technical problems are listed (p. 608).

II. EQUITIES

It is easily demonstrated that policies of life insurance can be issued at lower premium levels if there are no nonforfeiture values. It is not difficult to make a case for such a practice on the grounds that pure permanent protection at the lowest possible cost is socially desirable. It is impossible to believe that regulators would countenance whole life products that had no values prior to death, except possibly for purchase by corporations. The very phrase "nonforfeiture values" implies that regulators and legislators would find a zero-value permanent policy tantamount to a forfeit on surrender, and under our legal system the law abhors a forfeiture. This principle is overriding even though equity of a different sort can be achieved through premium reductions.

By definition, therefore, nonforfeiture values of any kind should return to terminating policyholders whatever equitable value may have been built up in a policy of life insurance. This brings us quickly to the definition of equity.

Equity, like beauty, is in the eye of the beholder: in the extreme, there are the following views of equity:

The policyholder: A terminating policyholder will view as equitable the return of all his gross premiums plus interest and less a reasonable charge for the cost of his protection. A continuing policyholder may view as inequitable anything that increases his cost of insurance merely to benefit a terminating policyholder.

The company: The insurer will view as equitable that which permits the company to recover its costs and which gives a reasonable gain for having assumed the risk in the first place.

The agent: If there is a selling agent, he will view as inequitable any value that does not permit him to retain his reward for having consummated a reasonable and legitimate sale.

The regulator: The regulator's views will be subject to conflicting pressures: He is motivated to want a maximum return to terminating policyholders, to protect the interest of continuing policyholders, and to ensure so far as possible the solvency of the company and its continuation as a healthy enterprise.

Equity, as Henry Jackson observed, is a hard taskmistress.

Values under the terminating policyholder's definition of equity were tested by the committee and were found to produce values similar to net level premium reserves. (If gross premiums equal net level valuation premiums, then such values are identical with net level premium reserves assuming tabular mortality and interest throughout.)

Values under the definitions favored by the continuing policyholder and the companies will be most closely related to asset shares. The continuing policyholder will object to paying for the losses caused by early terminations, and the company (shareholders in a nonparticipating company and policyholders in a mutual company) will have concerns about surplus drains caused by those losses and about the general viability of the business enterprise. The agent, who recognizes high early-year values as a plus from the sales point of view, would be reluctant to accept any charge-back of commissions in order to fund the losses arising from terminations at early durations on the allegation that these sales were improper sales. He would argue that much time and conscientious effort went into the sale and circumstances beyond his control caused the termination. He would, therefore, tend to hold views similar to the company's, that is, to regard values close to asset shares as being the most equitable.

Not only does equity depend upon who is asking; it depends also upon decisions the company makes as to how it will allocate functional expenses and upon cost accounting methods employed. What is equitable (under any definition) for one plan or company may be less so for another plan or company. Equity is not an absolute but a relative truth.

Clearly, there is no single definition of equity; any set of nonforfeiture values will be a compromise among the several views to achieve reasonable overall equity, and that, of course, is a matter of judgment.

The question of "whose judgment?" is discussed in the next chapter. On the question of "what compromise?" it is to be noted that in the long run the costs of early terminations will be paid by continuing policyholders. In the short run, if a company cannot fully pass on these costs, it will reflect them in reduced profits, policyholder dividends, or compensation to its agents, until a balance of conflicting interests is restored.

III. COMPARISON OF SYSTEMS

Under the traditional British system, judgment as to what is equitable is left to the company and in particular to the company's actuary. The nonforfeiture values are typically not guaranteed but depend on past experience and prevailing conditions, all tempered by judgment which, in turn, is influenced by considerations of fair play, competition, and disclosure. This treatment is consistent with valuation practices in the United Kingdom.

In the United States the actuary's judgment is relied upon to set values above a minimum prescribed in the Standard Nonforfeiture Law. It is the regulator's judgment, therefore, as expressed in the Standard

Nonforfeiture Law, that establishes *minimum* nonforfeiture benefits. Guaranteed cash values are required, and these must be fully disclosed and defined in the contract. They must be calculated according to prescribed mortality and interest assumptions. This treatment is also consistent with valuation requirements which are based on net premiums with prescribed assumptions as to mortality and interest. While technically valuation and nonforfeiture values are not linked in the Standard Nonforfeiture Law, it is difficult to use different mortality and interest assumptions, and reserves must equal or exceed cash values.

In Canada there is no legal requirement to provide guaranteed cash values, but industry practice is to provide them. In this sense, Canadian practice is similar to the United States practice, but, in relying on the actuary's judgment as to minimum equity, Canadian practice is similar to that in the United Kingdom. Again valuation and nonforfeiture practices are consistent.

By example, therefore, either a *laissez faire* system, a rigidly controlled system, or a mixed system is workable. Under any system, it is desirable to have general formulas, guidelines, and rules to provide some consistency of judging the reasonableness of nonforfeiture values, and it is essential that the valuation and nonforfeiture systems be consistent.

For the majority of our analyses, we have assumed the United States system would operate. If this is not the case, the proposals may be useful as guides to those called on to exercise judgment as to what constitute reasonably equitable nonforfeiture benefits.

IV. UNEXPLORED TERRITORY

In restricting its study principally to a system under which values are guaranteed, the committee excluded some more radical but perhaps preferable alternatives which we take note of here.

Should nonforfeiture values be guaranteed at all? The existence of guaranteed values has a significant impact on how a life insurance company is operated. Recent inflationary periods with falling asset values have caused some actuaries to become concerned with problems of cash flow and even solvency because of guaranteed values.

As an interim step, guarantees could be limited to less than the full term of the contract.

Even if nonforfeiture values are to be provided on a guaranteed basis, perhaps it would be desirable to guarantee the method by which the nonforfeiture values are determined, rather than the values themselves. As it is now, as of the date of issue nonforfeiture values for all future policy years must be guaranteed as to actual amount. This requirement

causes the insurer to make binding assumptions as to future experience for many years to come. If the guarantee adhered only to the method by which nonforfeiture values would be calculated in the future, it would be possible for the amount of nonforfeiture value available during a particular policy year to depend to some extent upon the experience during the years the policy had been in force.

These alternatives are all worth considering in any inquiry as to the fundamentals of nonforfeiture value regulation. Regulators or legislators may want to study some of the possibilities raised by these alternatives, particularly to assist product innovation. The committee's explorations did not encompass the above to any great extent.

V. THE COMMITTEE'S PERSPECTIVE

In reading this report, it should be borne in mind that it is the product of a committee of the Society of Actuaries. This will help to explain certain omissions, such as proposed new text for a revised nonforfeiture law.

Similarly, the present association of every member with a life company should be borne in mind (although two of our members had previous insurance department experience). Every member instinctively wants to see the life insurance industry thrive. None of us had the aim of revising the current distribution system. These perspectives may help explain the following list of primary concerns:

1. We feel that the method by which nonforfeiture values are currently regulated impedes new-product development at a time when changing social and economic patterns require innovative product designs to meet the changing needs of our clients. For example, present nonforfeiture value regulations have undoubtedly hampered the development of products such as indexed and life-cycle policies.
2. There are products in the current marketplace which conform to nonforfeiture regulations but which, on balance, do not appear to provide an economic benefit to the policyholder which is commensurate with their cost. These products often abide by the letter but not the spirit of the law.
3. An individual who terminates his permanent policy at an early duration may end up having paid a high price for temporary protection. In such cases, hindsight would make it readily apparent to the policyholder that a term policy would have been a better buy. On the other hand, it is important that any change in nonforfeiture regulations be realistic in its recognition of the actual costs incurred by life insurance companies in conducting their business in today's environment.
4. The expense factors in the present laws were established over thirty years ago and should be re-examined in today's environment. Similarly, mortality

has improved since development of the 1958 CSO table and the outlook for future interest rates is quite different.

5. Certain types of products are not subject to nonforfeiture requirements in most states, even though they bear resemblance to traditional life insurance products. Two examples are retirement annuity contracts and certain non-cancelable disability income policies. The committee felt that these omissions ought to be reviewed to determine whether or not omission is still warranted.
6. The adjusted premium method of defining minimum nonforfeiture values is relatively complex and difficult to explain to a layman. This fact plus the setting of a maximum interest rate can easily cause serious misunderstanding.
7. Our own experience and that of other Society members over three decades of the Standard Nonforfeiture Law has revealed certain minor technical flaws that could be corrected.

These concerns of our committee are listed at this point in our report so as to suggest some of the reasons why the committee went down certain roads and not others. The conclusions and recommendations of the committee also stem in part from our attempt to find answers to these concerns. Since these concerns are often conflicting, it is impossible to "answer" them all.

VI. THE CURRENT SYSTEM: THE NAIC STUDY

In 1941 the National Association of Insurance Commissioners Committee to Study Nonforfeiture Benefits and Related Matters submitted a report which covered in great detail matters of equity, reserves, and nonforfeiture benefits. It is impossible to do full justice to the report here, but a brief review provides useful background for the later sections of this report. (See Appendix A for their recommendations.)

The NAIC committee defined equity in the following way, which is fundamental to their conclusions: *a terminating policyholder should not leave the continuing policyholders in a worse position for his having been there.*

There appears to be no one fixed rule which should be followed in securing equity. Nonforfeiture benefits may be said to be equitable when they are established at such a level that the withdrawing policyholder will receive a benefit, be it cash or some form of continuing paid-up insurance, which will be as nearly as possible equivalent to his contribution to the funds of the company less the cost of the protection which he received and less the cost of introducing and maintaining him as a policyholder and which will not exceed the largest amount which can be paid to him without impairing the equities of the remaining policyholders of the company.

A consequence of this definition of equity is that it is meaningful only in the context of the individual company. The fact that cash values for a

policyholder of one company are higher than those provided in a comparable policy of another company does not imply that the latter affords less equitable treatment. Through the asset share mechanism, each company will make its own judgment as to what is equitable.

While the NAIC committee recognized that company *practices* would not necessarily conform to the principle of equity underlined above, it was quite firm in its conclusion that regulators should not mandate nonforfeiture values that would increase the cost to continuing policyholders.

No statutory nonforfeiture requirement should be imposed which requires the payment of larger premiums than would be necessary if the influence of voluntary withdrawals were ignored, that is to say, the statutes should permit nonforfeiture benefits to be incidental features to life insurance contracts.

After carefully considering the methodology and assumptions, the NAIC committee examined asset shares and model offices to test appropriate nonforfeiture levels in keeping with this principle. They recognized that experience would vary widely by company, but all had in common an unlevel incidence of expense; early-year expenses exceed those of later years and first-year expenses are highest of all. They concluded that a satisfactory approximation to typical asset shares would result from establishing standard first-year and level renewal expenses and permitting the difference to be amortized over the premium-paying period of the policy. The standard excess first-year expenses were set at a level to accommodate variations in experience among companies, primarily as to the *incidence* of expense.

While asset share calculations may not always be entirely reliable, they appear to be the best test of equity available to the Committee for the purpose of developing minimum values because (i) those expenses which are a fixed proportion of each premium may be disregarded, only the incidence of expense being involved, provided that the premium used covers the expense involved in the calculation.

Differences in the *level* of expenses by company were considered to be appropriately accommodated by the gross premiums or dividend scales.

That premiums be increased or that dividends be reduced to meet excessive minimum withdrawal benefits is not desirable. On the other hand, minimum values should not be dictated by the needs of a few companies whose cost of operation is excessive. Such excessive costs should be reflected in the premiums.

Similar reasoning led the NAIC committee to conclude that gross premiums need not be considered for nonforfeiture purposes. In short, differences in gross premiums tended to reflect differences in cost of operation or profit levels; when these differences are reflected in asset

share calculations, the same asset shares tend to result for all companies.¹ Since asset shares were the test for satisfactory values, gross premiums could be ignored.

The NAIC committee referred to the statutory recognition of excess first-year expenses in preliminary term valuation methods. By analogy with those modified reserve methods, that committee developed the "adjusted premium" method, under which, in a prospective reserve calculation, the net premium is replaced by a larger (adjusted) premium; the difference between the adjusted and net premiums represents the annual equivalent of the standard excess first-year expenses.

The NAIC committee recognized that statutory valuation tables of mortality and valuation interest rates would not necessarily be similar to asset share assumptions. (They were, however, proposing adoption of the 1941 CSO table, which significantly modernized mortality.) A pragmatic test was, therefore, performed, comparing cash values resulting from their proposal with their asset shares, discovering cash values to be safely within the asset share amounts.

VII. COMMENTS ON THE CURRENT SYSTEM

The Standard Nonforfeiture Law uses a prospective calculation to define the minimum value available to a surrendering policyholder. From the present value of the future benefits provided by a policy there is subtracted the present value of an "adjusted premium" which is the net premium plus a loading for "excess first-year expenses."

Since the adjusted premium exceeds the net premium, calculated nonforfeiture values at duration 0 are negative and may remain negative for a number of durations. Clearly, the minimum value at any point is a net level premium reserve less an expense allowance. The expense allowance at any duration is the unamortized portion of the initial expense allowance. The assumed mortality and interest rates used in net premiums and present values for calculating minimum nonforfeiture values are typically the same as those used to calculate policy reserves. Thus, statutory minimum nonforfeiture values are directly related to net valuation premiums and to net level premium reserves and are not directly related to gross premiums unless a company's gross premiums are related to its net valuation premiums. This relationship, or lack of it, is discussed in the next section.

The existence of a net premium relationship and the absence of a gross premium relationship can be explained in the following context: Gross

¹ The NAIC committee recommended cash values independent of the reserve basis for the policy, a recommendation rejected by the NAIC.

premiums are not regulated. Net premium accumulations, with proper adjustment for incidence of expense, offer a convenient standard vehicle for relating cash values to asset shares.

In short, the adjusted premium method is a purely pragmatic approach to minimum cash values, recognizing (1) that there is no such thing as absolute equity and (2) that rate regulation is generally repugnant in a free enterprise system. While at first blush the approach may seem unscientific and even arbitrary, it is in fact quite reasonable so long as these two constraints exist. The lack of a single definition of equity forces one, finally, to a pragmatic fixing of minimum cash values.

It is worth emphasizing that legislation deals only with *minimum* values. If there were an absolute principle of equity which mandated certain cash values, and if these values were established as a minimum, then the principle would be violated by every cash-value scale that departed from the minimum in either direction. Even at the time the Standard Nonforfeiture Law was enacted, many companies offered cash values substantially above the minimum, and the same is true today.

Also worthy of note is the emergence of the "high early-cash-value" plans under which values are equal or nearly equal to net level premium reserves (substantially the terminating policyholder's view of equity). It is not unusual to find such a plan in a company's ratebook alongside a plan providing minimum cash values.

These practices illustrate the point that cash values are only one part of the pricing structure, which also encompasses gross premiums, dividends, settlement options, conversion rights, loan interest guarantees, and a myriad of lesser factors. In his pricing, the actuary must consider all of these, and he can cope with any scale of cash values ranging from none to the practical maximum of the full net level premium reserve. As the early values become higher, however, they exert more influence on the gross premium, and thus on the relative equities of terminating and continuing policyholders, and force more attention to be given to lapse rates and to the level of early commission rates. The influence of cash values, therefore, can range from the NAIC committee's ideal of lapses having no influence on cost or compensation to their becoming dominant factors.

We think it undesirable that minimum nonforfeiture values be set at such a high level that they significantly alter compensation practices or adversely influence the cost to continuing policyholders to any great extent. (It is unrealistic to assume that a company will "absorb" the cost of higher early values—the cost will ultimately be passed on to policyholders through higher premiums or lower dividends.) Thus, unless

profit levels are to be regulated, the NAIC committee's ideal is still a desirable objective for minimum values.

While the adjusted premium method of the Standard Nonforfeiture Law has a number of defects, it has worked very well over the several decades it has been in use. In the absence of compelling reasons to change to another method, our committee's conclusion was to suggest keeping fundamentally the method of the Standard Nonforfeiture Law and to concentrate on improving it.

VIII. EXAMINATION OF THE RELATIONSHIP BETWEEN CURRENT MINIMUM VALUES AND GROSS PREMIUMS

The Standard Nonforfeiture Law is often criticized on the grounds that cash values are not related to gross premiums. Perhaps the easiest way to evaluate this criticism is to consider for a given level premium policy the elements which go into a nonparticipating premium. The NAIC committee report discussed the fact that similar logic applies for a participating policy, with premiums omitting any provisions for contingencies or dividends (*Reports and Statements on Nonforfeiture Benefits and Related Matters*, pp. 65 and 66).

Although level nonparticipating premiums cover nonlevel expenses and benefits, they may be viewed as consisting of the following elements:

1. A "level" amount for expenses which do not vary substantially by duration (i.e., largely maintenance costs).
2. Another "level" amount which is intended to recover expenses that are not level by duration, primarily first-year expenses for acquisition.
3. A profit element which need not be "level" but, for convenience, is assumed to be.
4. An "office" net premium which provides for all of the benefits, including nonforfeiture values, actually payable under the policy provisions.

All but the second element go directly to provide benefits, pay maintenance expenses, or produce profit. The second element goes to amortize the additional acquisition expense which is temporarily "borrowed" from capital, surplus, or other policyholders. Conceptually, until that amount is repaid, the terminating policyholder "owes" the unamortized amount, and this "debt" is reflected in the asset shares.

Two companies having identical acquisition costs, offering identical benefits, and assuming identical mortality and interest will have practically the same asset shares, assuming profit is withdrawn. This is true even if maintenance costs and profit objectives differ, since these essentially level elements will be reflected in differing gross premiums. (This latter point is key to this discussion and emphasizes the fact that

minimum values are not directly related to gross premiums.) In other words, the asset shares are practically independent of items 1 and 3. Similarly, the asset share at duration 0 (usually a deficit) will vary for the two companies due to item 2 only to the extent that these expense items for the two companies differ. Such an expense differential would normally be reflected as an annual increment to the gross premium. However, because it is amortized, this annual charge would normally be a small fraction of the difference in acquisition expenses.

The Standard Nonforfeiture Law recognized the relative independence of asset shares from the margins contained in the gross premium for renewal expense and profit and for convenience introduced a "standardized" adjusted premium which would basically recognize only items 2 and 4 and would result, both prospectively and retrospectively, in minimum nonforfeiture values. In defining the adjusted premium the law set a limit on acquisition expenses which accommodated the great majority of companies. Also, in item 4 the law specified a reasonably modern mortality table and a maximum interest rate which could be reasonably expected to be earned at the time. It went further to ignore voluntary termination rates of policyholders, on the theory that if the nonforfeiture values were exactly equal to the asset shares (including negative ones), the nonforfeiture values would be independent of termination rates and therefore continuing policyholders' values would not be affected.

In practice some violence is done to this ideal view of equity, since there are negative asset shares and there are no negative nonforfeiture values. In practice there are voluntary terminations, and continuing policyholders do in fact contribute to the recovery of deficits left by the early terminations. However, the smaller the early-year deficits (i.e., the smaller the excess first-year expense relative to the gross premium), the closer we come to the "ideal" equitable relationship among policyholders' termination values.

In the committee's opinion, the present law, by introducing the concept of adjusted premium, recognized that there are valid reasons for different companies to charge different prices for identical products. Life insurance companies operate under different circumstances just as other businesses do. The restraint on acquisition costs due to the expense limit and the overall competition of the marketplace puts the burden on the individual company to operate as efficiently as possible.

It is desirable that all factors entering the adjusted premium calculation be brought close to experience, for only in this way will the result be reasonably related to asset shares. While we are using the term loosely,

asset shares are a logical measure of whether a departing policyholder will affect the cost of continuing policyholders and to what degree. So long as this objective is valid, factors close to experience will help achieve this objective.

It should be recognized that a substantial portion of acquisition expenses are a function of the *gross* premium, while the percentage allowance in the law is a percentage of the *adjusted* premium. Any change in the adjusted premium resulting from new mortality or interest rate assumptions must be reflected in changes in the percentage factor of the formula, if the same dollar allowances are to be maintained. Thus, expense allowances and mortality and interest assumptions must be considered together for the overall effect of changes in each.

In later chapters a range of expense allowances is suggested, and mortality and interest "modernization" are considered.

IX. FORMULA SIMPLIFICATION

A major simplification is suggested in this chapter; other chapters deal with other complexities as they relate to problems dealt with in those chapters. In this chapter we propose that the percentage allowances in the adjusted premium formulas be related to *net* premiums rather than to *adjusted* premiums, after satisfying ourselves that the minor differences in expense allowances that this entails can easily be accommodated in the process of updating those allowances.

As stated in general terms earlier, the following is the definition of cash values at duration t under the Standard Nonforfeiture Law:

$$CV_t = A_t - P^a \ddot{a}_t,$$

where A_t is the present value of future benefits, P^a is the adjusted premium for the policy, and \ddot{a}_t is an annuity for the remainder of the premium-paying period.

Viewed retrospectively the formula is

$$CV_t = P^a \ddot{s}_t - S'_t - E'_0 k_t,$$

where \ddot{s}_t is a forborne life annuity for t years, S'_t is the value at t for the benefits since issue, E'_0 is the excess initial expense allowance, and k_t is the value of 1 at issue accumulated with the benefit of interest and survivorship to time t . It is interesting to note that either formula may also be written as a net level premium reserve less the unamortized surrender charge.

Prospectively	Retrospectively
$V_t - (P^a - P) \ddot{a}_t,$	$V_t - [E'_0 k_t - (P^a - P) \ddot{s}_t],$

where V_t and P are the t th net level premium reserve and the net level premium, respectively, under the nonforfeiture mortality and interest assumptions.

While obvious to the actuary, these relationships are stated here as background to the discussion in Chapter XII on accumulation methods for open policies. The adjusted premium is defined as follows in the law:

[T]he adjusted premiums for any policy shall be calculated on an annual basis and shall be such uniform percentage of the respective premiums specified in the policy for each policy year, excluding amounts stated in the policy as extra premiums to cover impairments or special hazards, that the present value, at the date of issue of the policy, of all such adjusted premiums shall be equal to the sum of (i) the then present value of the future guaranteed benefits provided for by the policy; (ii) two percent of the amount of insurance, if the insurance be uniform in amount, or of the equivalent uniform amount, as hereinafter defined, if the amount of insurance varies with duration of the policy; (iii) forty percent of the adjusted premium for the first policy year; (iv) twenty-five percent of either the adjusted premium for the first policy year or the adjusted premium for a whole life policy of the same uniform or equivalent uniform amount with uniform premiums for the whole of life issued at the same age for the same amount of insurance, whichever is less. Provided, however, that in applying the percentages specified in (iii) and (iv) above, no adjusted premium shall be deemed to exceed four percent of the amount of insurance or uniform amount equivalent thereto.

Thus P^a is derived from the following equation:

$$P^a \ddot{a}_0 = A_0 + 0.4 \left[\frac{P_1^a}{0.04} \right] + 0.25 \left[\frac{P_1^a}{OL^a} \right] + 0.02 .$$

In this equation and throughout the remainder of this report, whenever a bracket contains more than one value, the smallest of the quantities in each bracket is to be used. OL^a is an adjusted premium for a whole life policy, and \ddot{a}_0 is understood to allow for variations in gross premium by duration. For example, for a three-year modified whole life policy,

$$P^a \ddot{a}_0 = P_1^a \left[\ddot{a}_{x:\overline{3}|} \right] + \frac{G_4}{G_1} (\ddot{a}_x - \ddot{a}_{x:\overline{3}|}) ,$$

where G_4/G_1 is the ratio of the ultimate to initial gross premiums.

From this simple example, it is seen that the calculation of adjusted premiums can become quite complicated for plans other than level premium whole life. Even on that plan, the equation becomes

$$OL_x^a \ddot{a}_x = A_x + 0.65 \left[\frac{OL_x^a}{0.04} \right] + 0.02 .$$

and when $OL_x^a \leq 0.04$ this becomes

$$OL_x^a = \frac{A_x + 0.02}{\ddot{a}_x - 0.65}$$

and the expense allowance at issue (E'_0) is

$$\begin{aligned} (OL_x^a - P_x)\ddot{a}_x &= \left(\frac{A_x + 0.02}{\ddot{a}_x - 0.65} - P_x \right) \ddot{a}_x \\ &= \left(\frac{0.02 + 0.65P_x}{\ddot{a}_x - 0.65} \right) \ddot{a}_x, \end{aligned}$$

where P_x is a nonforfeiture net premium which may not be on the same basis as the valuation net premium.

A significant simplification can be achieved by removing the circularity of the adjusted premium formula and basing percentage expense allowances on net premiums instead of on adjusted premiums.

Thus, for the whole life plan, E'_0 would become $bP_x + M$, where bP_x is an expense allowance equivalent to 65 per cent of the adjusted premium and M is a new per \$1,000 allowance. Such a simplification becomes increasingly of value as the plans become more complex.

The major disadvantages of this proposal are the following:

1. The closer link to net premiums may restore to popular currency the belief that valuation reserves represent policyholder equity.
2. A higher percentage allowance is needed for equivalency of numerical values than if adjusted premiums were used. This makes it appear that more of the policyholder's premium is being "confiscated."

These are significant points, but item 1 can and should be overcome by removing the link between the nonforfeiture and the valuation basis, and in item 2 the percentage change required is modest. For example, substituting net for adjusted premiums in the current formula for whole life would reduce initial expense allowances by only 2-4 per cent over most age ranges (assuming $3\frac{1}{2}$ per cent interest).

The ratios will differ for other plans and will be affected by the maximum adjusted premium permitted in determining the expense allowance. Expense allowance factors are empirically determined to "fit" a selected set of data; they can as easily be determined for net premiums instead of adjusted premiums in the process of updating the allowances.

X. LEVEL OF EXPENSE ALLOWANCES

It is desirable to set expense allowances at a level related to industry experience, recognizing that pragmatic tests must ultimately be applied; that is, each company must test the new minimum values that would

emerge and assess the impact on its pricing structure. By stipulating a single set of excess first-year expense allowances, the regulation process forces a company to operate within those levels of expense or to change the price it charges for its products, thus bringing competition into play.

This interplay of competitive and regulatory forces will be influenced by the general level of expense allowances stipulated. The NAIC committee recommended “[p]rovision . . . for the amortization of the largest reasonable excess of initial over renewal expense that can be justified,” presumably to allow the fullest effect of competitive forces and to leave room for the small, struggling company not able to operate with the same efficiency as well-established companies.

At the opposite extreme, the expenses of the most efficient company could be specified as the maximum expense allowance, forcing competitors to improve or to suffer in the marketplace.

We take no philosophical position on whether the highest or the lowest expense levels are more appropriate, and we recommend no specific set of expense allowances, only noting, as we did earlier, that the actuary in his pricing can cope with any reasonable set of cash values.

We did, however, attempt to examine the range of reasonable allowances under current conditions. A review of the data of companies employing members of our committee served to confirm the significant effect of methods and judgment applied by each company in allocating expenses between first-year and renewal and between per policy, per thousand, and per dollar of premium expense.

With these important qualifications in mind, the range of results on whole life allowances, in the same form as the allowances in the current law, would be \$7–\$10 per \$1,000 plus 80–127 per cent of *adjusted* premium.

In search of guidance from industry figures, we examined the reports of the Expense Committee of the Canadian Institute of Actuaries, which has published intercompany data on expenses for many years. In 1970 the committee recommended an “expected” expense formula which, for all lines of business, reproduced the expenses of ten large Canadian companies in 1969. Ratios for each line were similarly near 100 per cent. The ordinary life portion of the formula is as follows:

	First Year	Formula 70 Renewal	Excess
Per policy.....	\$100.00	\$7.10	\$92.90
Per \$1,000.....	\$ 4.00	\$0.50	\$ 3.50
% of gross premium.....	100%	5.50%	94.50%

Using the average size of new issues for those companies to convert per policy to per \$1,000 expenses, Formula 70 would produce the following excess expense allowance:

\$9.57 per \$1,000 plus 94.5 per cent of *gross* premium.

To convert the percentage of premium factors to apply either to adjusted premium or to net premium, it will be necessary to decide on the level of the underlying net premiums and to examine the level of gross premiums. The above result suggests, however, that the current expense allowance formula (\$20 per \$1,000 plus not more than 65 per cent of the adjusted premium) provides some margin in the per \$1,000 component and less than needed in the percentage of premium component for the average large company.

In 1971 the Expense Committee began publishing data by line of insurance and company in two groups for large and small companies. In the Expense Committee's words, "Each company, of course, has its own methods for allocating expense to the various lines of business and these methods are not necessarily consistent as between companies." This fact, plus actual differences in expense levels, produced the following individual insurance ratios for 1974:

	1974 FORMULA 70 RATIOS	
	Large Companies	Small Companies
High.....	138%	170%
Low.....	98	115
Total.....	114	137

For comparison, the results of twelve large United States mutual companies in 1974 ranged from 78 to 114 per cent for individual life insurance.

Assuming the changes in ratios since 1969 are due to inflation, it is probable that first-year and renewal expenses have not been equally affected. Thus we hesitate to use these ratios to bring 1969 allowances forward in time (see later remarks on inflation). Nonetheless the following are the results emerging from so applying the 1974 ratios to Formula 70 allowances and using aggregate average sizes for the two company groups to convert per policy allowance to a per \$1,000 basis:

Large companies: \$8.60 per \$1,000 plus 107.7 per cent of gross premiums;

Small companies: \$11 per \$1,000 plus 129.5 per cent of gross premiums.

For further guidance, the committee also examined data published by the Life Office Management Association for six large companies comprising both stock and mutual and operating on both general agency and branch office systems. This produced a range of results quite as wide as and considerably different from the Formula 70 analysis. In particular, stock companies show higher results than mutuals (probably a significant factor in the different results in Canada between small and large companies).

It is obvious that expense allocation techniques vary widely. Results are also influenced by type of distribution system and differ between stock and mutuals, combination and ordinary companies. Even an extensive study may not lead to conclusive results on an industry-wide basis. With the thought that the data of a well-run company would likely be the most reliable guide, we approached the low company in the LOMA study mentioned above. The data they kindly furnished have led to the conclusion that the following formula would be reasonably representative for their main whole life-type plan at the \$10,000 level for most issue ages:

\$10 per \$1,000 plus 90 per cent of 1958 CSO $3\frac{1}{2}$ per cent net premiums.

This, then, is probably a satisfactory lower end to the range of experience factors. (This company is consistently low in expense comparisons, and \$10,000 for an average size is well below the industry figure of \$14,300 for United States issues in 1974.) If the same expense allocation techniques could be applied to a group of high-cost companies, then the upper end of the range would be determined on a consistent basis. For obvious reasons, the committee could not undertake such a study, but, judging from the Formula 70 range of results and prevailing gross premium levels, we conclude that appropriate whole life expense allowance factors for most companies in North America would be bracketed by the following two formulas:

Low \$10 per \$1,000 plus 90 per cent of 1958 CSO $3\frac{1}{2}$ per cent net premiums;

High \$20 per \$1,000 plus 150 per cent of 1958 CSO $3\frac{1}{2}$ per cent net premiums.

We wish to emphasize that the percentage of premium factor is most closely related to gross premiums; to translate appropriate gross premium allowances to factors applicable to net premiums, those net premiums must first be selected and their relationship to gross premiums appraised. This is considered in Chapter XIII using net premiums based on a modern mortality table and interest at $4\frac{1}{2}$ per cent.

Purely for test purposes, and in the interest of simplicity, we have used the following expense allowance formula (see Appendix D):

Test formula: \$10 per \$1,000 plus 100 per cent of 1958 CSO $3\frac{1}{2}$ per cent net premiums.

While we use these specimen factors, we emphasize that we do so merely to test the relative effects of various proposals we wished to consider. After settling the philosophical questions, various expense allowances should be tested in conjunction with other changes that might be under consideration, such as a new mortality table. Just as a dividend scale determined by the contribution method must be tested in total, so a cash-value scale must be tested for its overall effect.

In considering the effect of inflation on the level of expense allowances permitted in the determination of minimum values, it is important to emphasize the point that, for purposes of this report, we are concerned only with the excess of first-year costs over renewal costs. While it is probable that renewal maintenance expenses on a given block of policies will increase significantly over the life of those contracts, increases in first-year costs are offset to some degree by other factors.

For example, it is reasonable to assume that average policy size will be subject to the same degree of inflation as per policy expenses, making this cost element relatively inflation-proof. Similarly, the percentage of premium excess first-year expenses are not likely to be affected by inflation. First-year commissions as a percentage of premium have remained at a fairly stable level for many years. In addition, even though pressures for increased compensation and changes in state regulations limiting first-year expenses may give rise to some increases, commission rates are established before contracts are sold. Changes can be reflected in the pricing of new products.

The remaining element, acquisition costs expressible as a percentage of face amount, may be subject to inflation. However, unless we anticipate continuous "double-digit inflation," this will not have a significant impact on the overall expense allowance for calculating minimum values. Further, it is undesirable to anticipate the continuation of "double-digit inflation" to the extent that this anticipation would require an overstatement of the expense allowance at the time new standards are adopted. Instead, it would be desirable to review allowances periodically.

For these reasons it is the conclusion of this committee that it is not necessary or desirable to reflect the effect of inflation in the determination of the expense allowance for the purpose of calculating minimum non-forfeiture values.

XI. STANDARD PLANS OTHER THAN WHOLE LIFE

Expense allowances appropriate to whole life may not be appropriate for other standard plans. It is the purpose of this section to consider allowances for other plans consistent with those for the bellwether whole life plan.

Excess first-year expenses arise principally from sales compensation, expressible as a percentage of premiums, and from policy establishment expenses, expressible as an amount per \$1,000 of face amount. Establishment expenses arise principally from underwriting and issue. For a given size of insurance policy there is little difference in underwriting cost by plan. Similarly, the cost of issue does not vary significantly by plan, whether the contract is an annuity or a term insurance policy.

By contrast, sales compensation expense varies significantly by plan. Company practices differ, but it is typical to pay the largest percentage first-year commission on whole life. The current standard nonforfeiture formula reflects this practice by providing an expense allowance of 40 per cent of the plan first-year adjusted premium and 25 per cent of the lesser of the plan first-year adjusted premium or the whole life adjusted premium with a \$40 per thousand limit on any adjusted premium.

After considering a number of alternative approaches, as outlined in Appendix B, the committee considers the approach in the current law (relating expense allowances to the whole life and plan premiums) to be the most consistent with current practices and recommends its continuance with the substitution of net for adjusted premiums in the formula and with changes in the numerical values of the percentage allowance factors.

Numerical Values

Since the major portion of premium-related first-year expense arises from sales activity, the committee considers it satisfactory to vary percentage expense allowances from plan to plan in direct proportion to first-year commissions. From average published commission rates² and gross premiums,³ the committee derived percentage of net premium factors that best reproduced those commissions over a representative age range. It was concluded that a satisfactory fit would be obtained by weighting equally the whole life and plan net premiums, provided a maximum net premium of \$55 was employed. This gives rise to the following high and low formulas corresponding to those for whole life in Chapter X.

² *LIMRA Compensation Handbook*, 1973.

³ *Best's Flitcraft Compend*, 1975.

$$\text{Low: } E'_0 = 0.45 \left[\begin{array}{c} P \\ 0.055 \end{array} \right] + 0.45 \left[\begin{array}{c} P \\ OL \\ 0.055 \end{array} \right] + 0.01 ;$$

$$\text{High: } E'_0 = 0.75 \left[\begin{array}{c} P \\ 0.055 \end{array} \right] + 0.75 \left[\begin{array}{c} P \\ OL \\ 0.055 \end{array} \right] + 0.02 .$$

OL and P are the whole life and plan net premiums, respectively, on the nonforfeiture basis.

There was some sentiment in the committee for eliminating the limit on net premiums in order further to simplify the formula. This would affect only the highest ages. A similar effect can be achieved by limiting the expense allowance to some (equally) arbitrary amount.

Given the empirical nature of the factors in the current law, the committee feels that it is neither necessary nor desirable to labor at refinements in updating those factors.

For our test formula we did not use the above factors but instead used the following *purely for convenience and simplicity*:

$$\text{Test: } 0.5 \left[\begin{array}{c} P \\ 0.05 \end{array} \right] + 0.5 \left[\begin{array}{c} P \\ OL \\ 0.05 \end{array} \right] + 0.01 .$$

XII. PRODUCTS WITH VARIATIONS AFTER ISSUE

Products may have a variety of combinations of benefits, premiums, and premium periods, and these may change after issue. These products are examined in this section. We found it convenient to consider products in two broad categories: (1) those where future changes are fully defined at issue and (2) those where one or more future changes depend on future events.

A. Fully defined products.

1. Varying death benefits.

The per \$1,000 expense allowance discussed in previous sections reflects the cost of underwriting and issuing a policy. Underwriting costs vary more or less directly with policy size, while issue costs are a per policy expense translated to a per \$1,000 factor through use of an average size assumption. If insurance amounts are not level by duration, a question arises as to the amounts of insurance to be used for the expense allowance calculation. The current law defines an "equivalent uniform amount" under which the present value of future varying insurance amounts is equated to a level insurance for the same period. This uniform amount is the basis for the per \$1,000 expense allowance. This eminently reasonable

solution may give rise to excessive expense allowances traceable to changes in insurance amounts at advanced durations, and there are instances where unusual benefit patterns have been designed merely to achieve large expense allowances.

While there exists a variety of practical solutions to this type of abuse, the solution that appeals to the committee as the most logical in principle springs from the fact that underwriting requirements and costs are most closely related to the initial amount of insurance and almost totally unrelated to amounts beyond the tenth year (while selection tends to persist throughout life, the underwriter cannot, as a practical matter, concern himself with changes in amount at the later durations). Therefore, the underwriting expense allowance should be a function of the average amount of insurance in the early policy years rather than over the full policy period.

It would be convenient to base this allowance on the first-year amount only, but this would leave open the possibility for manipulation of face amount schedules to achieve excess expense allowances. Using the first ten years would not do a great injustice to the principle but would substantially obviate any possibility of manipulation. Hence, the committee recommends continuance of the equivalent uniform amount method modified to equate insurance amounts in the first ten years to a level insurance for the same period. The effect of this proposal is shown in Appendix C.

2. Varying gross premiums.

a) Premiums varying by duration (but not by policy size).

The current law applies the percentage expense allowance to the *first* adjusted premium on the logical supposition that excess first-year compensation costs are related to the first premium. As with varying insurance amounts, odd premium patterns can be devised to produce high expense allowances, which do not necessarily reflect compensation patterns. (Deposit term and deposit whole life are examples.) On the other hand, policies with increasing premiums will have a low initial expense allowance, even though compensation may be paid at the first-year level on premium increases.

The committee believes that, in principle, two plans with identical benefits and identical premium-paying periods should have identical expense allowances. Thus the solution proposed is to base the percentage expense allowance on the net premium for an otherwise identical policy with level premiums.

b) Premiums varying by duration and policy size.

The Standard Nonforfeiture Law requires that adjusted premiums be a uniform percentage of the gross premiums. This matches expenses with revenue and is consistent with generally accepted accounting principles and practice.

The requirement causes a problem, however, in that different minimum cash values are required for different policy sizes if both of the following conditions exist:

(1) Premiums are not level by duration.

(2) Premiums per \$1,000 of insurance vary by size of policy.

Obviously this result is unintentional and unrelated to asset shares.

If premiums increase with duration, it is easily shown that minimum values are highest for the smallest policies, provided discounts for size follow the usual pattern of discounting a given amount per \$1,000 by size bands or through a policy fee.

Conversely, if premiums decrease with duration, the smallest minima will apply for the smallest policies.

If expense allowances are based on levelized net premiums, as proposed above, then the *initial* expense allowances for these plans will be independent of size. It is the degree of amortization of this initial allowance by duration that is affected by the addition or subtraction of constant amounts per \$1,000 from a gross premium that varies by duration.

The obvious solution is to remove the size variant. There are several ways to achieve this:

i) Amortize the initial expense allowance as a uniform percentage of *net* premiums.

There are practical objections to this, since companies may have unlevel net premiums and level gross premiums, causing problems on level premium plans.

ii) Base minimum cash values on the minimum size issued.

This has a certain surface appeal in that it would mandate the highest minimum values, but it would influence companies to set high minimum issue sizes.

iii) Remove the pricing element that produces a variation by size.

This solution is both direct and simple for a company on the fee system. It is merely necessary to test values using gross premiums independent of fee; for a company on the band system, tests would employ gross premiums for the

largest-size issue. That this is tantamount to removing the size variant can be readily understood by recognizing that a policy fee, expressed as an amount per \$1,000, approaches zero as the policy size approaches infinity. Alternatively, companies should be permitted to remove the equivalent of a policy fee inherent in their pricing. This alternative would be preferable where the maximum issue size is relatively small, for example, \$10,000. Substantially eliminating the variation by size would largely restore the status prevailing before grading premiums by size came into use.

B. Policies with future changes undetermined at issue.

In this section it is convenient to distinguish between policies where there are optional future changes which are defined in advance (multi-track policies) and policies such as life-cycle policies where future changes depend on future circumstances (open policies).

1. Multitrack policies.

These policies typically have a "main track" down which policy benefits and premiums will proceed if the policyholder takes no action, and alternate tracks optional with the policyholder. A simple example would be a whole life policy with the following options at the fifth duration.

- a) Increase the premium so that the policy becomes paid up at age 65 for the same amount of insurance.
- b) Continue the same premium but reduce the face amount so that the policy becomes paid up at age 65.
- c) Continue the same premium but increase the face amount to that provided on the term to age 65 plan.

Viewed from issue, each of these gives different expense allowances from those applicable to whole life. The committee understands that insurance departments take different views on such plans. Some take the position that each track must be analyzed with expense allowances set at the lowest level emerging from this analysis. Others apparently accept "main track" values at issue.

We believe the differences can be resolved by adopting the principle that so long as a policy is on a particular track, its future values should be based on that track. When it changes tracks, future values should change to the new track. Accordingly, the expense allowances calculated at issue would be based on the automatic track. Future changes which resulted in a lower premium would not reduce the expense allowances calculated at issue. (Note that the excess original first-year expenses have already been in-

curred and are unaffected by future changes.) On the other hand, for future changes resulting in an increase in premium over the automatic track, it would be appropriate to allow an increment in the expense allowance at that duration. Presumably, the company will pay additional compensation and, if the face amount increases, may incur additional underwriting expense. We suggest that any increment in expense allowance be limited to the increment in net premiums at the point of change.

We acknowledge that this somewhat one-sided arrangement could be taken advantage of through the development of an automatic track which provided a relatively large initial expense allowance, with the company then encouraging the selection of a set of options which would have provided a much lower initial expense allowance had they represented the automatic track. We do not believe such a potential abuse is controllable through the Standard Nonforfeiture Law. If the peculiar track and its accompanying values could be issued as a separate policy, it must be allowed in a policy with options. Clearly, it would be unfair to press all companies into a lowest-allowance posture to control the limited number of possible abuses.

2. Open policies.

- i) Open policies are defined as policies that provide contractually for the possibility of changes in benefits, premiums, or premium-paying period but which do not spell out numerically when the changes are going to occur or what they are going to be. Chief examples are (a) policies whose benefits and/or premiums would be linked with cost-of-living indexes and (b) life-cycle policies. The development of such policies is hampered under existing nonforfeiture laws.

The committee concluded that, because benefits and premiums could not be predetermined, it was not technically possible to develop a new law that spells out in complete mathematical detail how such policies should be covered. Alternative routes for such policies were therefore considered.

One possible alternate route would be a simple statement that cash values calculated on a basis consistent with the principles underlying the nonforfeiture law and considered satisfactory by the regulator would be deemed legal. This was considered to be too vague and general to be of any practical help to the regulator in enforcing the law.

The committee therefore sought some middle ground between a general statement such as the above and the almost impossible task of a law specific in all details.

One possible method would be along the lines of the accumulation approach proposed by the committee for annuities in Chapter XVI. This would provide that certain stated percentages of gross premiums would need to be accumulated as cash values. This method, however, presents serious difficulties. The percentages to be accumulated should probably differ between participating and nonparticipating policies and also by plan and age. Inevitably, no matter what they are, the percentages specified in such a law would result in constraints on the type of dividend margins or gross premium levels a company might otherwise choose for the policy. Thus, the method would in effect provide a form of price control or rate regulation. This would involve the potential risk that certain policies would not be self-supporting, which, in turn, would likely be a violation of other insurance laws.

The committee felt that a gross premium accumulation method would not eliminate problems in the development of practical life-cycle or cost-of-living policies. It is unlikely that a single set of percentages could be found which would be satisfactory for the broad spectrum of policy changes occurring at varying durations. Finally, a basic defect of the gross premium accumulation method is that it would not give results that are entirely consistent with the adjusted premium method. It would appear that if an open policy ends up being a straight life policy, its minimum values ought to be the same as the straight life policy. It would be highly undesirable to have two minimum-cash-value methods which differ when they meet.

The committee believes that the traditional prospective adjusted premium approach can accommodate most open policy-type plans by assuming that changes not stated numerically in the policy would not occur. The adjusted premium would then be determined at issue in the usual manner so that the present value of adjusted premiums is equal to the present value of future benefits plus the expense allowance. When a change in benefits or premiums does occur, new adjusted premiums would be calculated such that their present value equals

- a) The present value of future benefits less the current minimum cash value and
- b) Any new expense allowance resulting from the change, again assuming no further changes beyond the point of recalculation.

With respect to the expense allowance, there seems little question but that the amount of expense allowance at original issue should be the same as for a standard plan beginning with the same initial policy features. Furthermore, it should be amortized in the same manner. To reach a conclusion as to whether future changes in expense allowances should occur as policy changes occur, it is useful to consider the type and origin of excess first-year expenses, that is, compensation, underwriting, and issue. While there may be exceptions, some of these same types of expenses will likely be incurred when either the premium or face amount increases. First-year commissions will likely be paid on any increase in gross premiums. Increases in face amount, unless they are nominal, will likely result in some underwriting expense. On the other hand, since expenses of policy establishment at the time of change should be much less than at the time of issue, there are grounds for providing a smaller initial expense allowance on such increases than on a newly issued policy. How much smaller is a far more difficult question to answer. The committee concluded that, in the interests of simplicity and encouragement of experimentation, full formula expenses should be permitted to apply to increases in premium or amount at the time these occur.

This conclusion creates an inconsistency: Full initial expense allowances on policy increments could easily result in negative cash-value increments. This result is different from a new issue where negative values are uncollectable. It would be difficult to explain to a policyholder who has increased his premiums that his cash value has decreased. In fact, however, a negative increment in cash values is not unreasonable when it reflects the actual incidence of expenses incurred in connection with the change. The cost of underwriting which is incurred when the face amount increases without a corresponding increase in premium would be one example. Such costs could be reflected in the cash values only if negative increments were allowed. An inability to collect such costs from those terminating shortly after a change would mean increased costs for continuing

policyholders. Being able to collect the full costs of change would put companies in a position to make the change on the most favorable terms. Recalling that the Society meeting discussions preceding formation of our committee are rife with criticisms of the current law's inflexibility in the "open policy" area, the committee's conclusion was to resolve the inconsistency in favor of flexibility and to recommend full allowances at time of change.

For completeness, the committee also considered the possibility that premiums or amounts would decrease. We do not believe these changes should reduce or reverse initial expense allowances, since the initial costs for underwriting, compensation, and issue will already have been incurred and cannot be reversed. There is even some ground to argue for more allowance at the time of such change to cover the cost of the change. However, the committee felt that it would be more appropriate to reflect any such costs in increased gross premiums rather than in reduced cash values. This is consistent with the proposal for multitrack policies.

- ii) The above discussion is geared primarily toward life-cycle and indexed policies. One can envision, however, a completely "open" policy which requires only that premiums be deposited from time to time and that death benefits be provided in an amount elected from time to time. At issue, only the first premium and the initial death benefit are known.

The "reserve" for such a contract in the first year would be the amount left over after the company has subtracted its loadings and the cost of insurance for the current year to date, accumulated with benefit of interest and survivorship. This reserve would be credited with net deposits, as they are made, and with periodic increments for interest and survivorship, and debited with the cost of benefits as provided.

Since there is no plan or scheduled premium, such a contract cannot be viewed prospectively for reserve or nonforfeiture purposes. It is not possible to force such an arrangement into the mold of the Standard Nonforfeiture Law, yet who can argue that the public should be denied a product with such great flexibility?

As indicated earlier, the committee considered a gross premium accumulation approach with specified loadings and rejected it. There is no need to regulate loadings on an open

policy, just as there is no need to regulate the loading on a traditional policy. There is, in fact, an inherent limit on the first year's loading, in that it cannot exceed the premium remaining after providing for the cost of insurance. Any expenses in excess of this must be recovered from renewal loadings. This is the same practical limit on first-year loadings inherent in the Standard Nonforfeiture Law, which often permits zero (but not negative) first-year values.

In summary, the same marketplace forces and first-year loading constraints exist to a similar degree in an open policy and a traditional policy. In the early experimental period for such policies, the regulator can best discharge his responsibilities by requiring disclosure of these loads so that market forces can have full sway. As experience develops, guidelines may appear desirable. In the meantime, we believe it is in the public interest to permit such policies to be offered and recommend that the regulator be given broad powers to approve them.

- iii) Recognizing that some insurance departments may be reluctant to undertake review of highly technical or complex products, the committee also considered the suggestion of an outside entity which could serve as a vehicle to review all open policies on behalf of the individual state insurance departments. For example, an entity such as the current NAIC Central Office could be expanded to include a staff of accountants, lawyers, and actuaries which would serve the individual insurance departments. Although this concept has certain overall cost savings features to the various state insurance departments through consolidation of all technical expertise, it has a more practical and fundamental benefit for the insurance industry. If such an office were properly staffed, the insurance industry would have a single entity through which all technical problems could be resolved. For example, this office could review all unique or unusual policies to determine actuarial soundness, to consider questions of equity, to consider reserving implications, and to consider any other technical questions. After all technical questions have been resolved, a letter of clearance could then be sent to the individual states in which a company operates. In effect, the individual states would have their own professional accounting/legal/actuarial consulting firms to assist them in their deliberations.

Under an approach of this type, companies could submit

unique policies for review and comment before filing with the state insurance departments. After all technical areas had been fully resolved, the office would then inform all states in which the policy was being submitted for approval that the policy satisfied technical considerations of equity as well as reserve requirements. Through this approach sufficient flexibility would exist that new and unique policy forms—that is, policies as yet undeveloped—could be considered. Standard policies could be reviewed by the individual states in the manner in which they are now acted upon. However, any and all unique products which do not readily lend themselves to the current law would have a forum through which they could be reviewed and ultimately passed upon.

The Society of Actuaries could directly participate by establishing a committee to assist the NAIC and this office in reviewing new products. Thus, problems considered too difficult for immediate resolution could then be reviewed by a Society of Actuaries committee. It was our committee's feeling, however, that although this concept merits serious attention, it is not within the province of this committee or the Society of Actuaries to initiate action along this line. It is our feeling that this is an issue which more properly should be considered and developed by the regulator.

XIII. INTEREST AND MORTALITY

The committee has not undertaken the task of recommending a new mortality table or a specific level of interest rates for nonforfeiture purposes. We do, however, test the effect of "modern" mortality and interest, when combined with our test set of expense allowances (see Chaps. X and XI).

We first show the effect of changing only the expense allowances from those in the current law. The "test" allowances are the following:

Whole life: \$10 per \$1,000 plus 100 per cent of the net premium;

Other life and endowment plans: \$10 per \$1,000 plus 50 per cent of the net premium for the plan and 50 per cent of the whole life net.

There would be a \$50 limit on the net premium to which the percentages apply. 1958 CSO mortality and $3\frac{1}{2}$ per cent interest are employed.

The results of this test are shown in Appendix D. While the test allowances do not constitute a recommendation, we note in passing that on all three plans tested (whole life, twenty-payment life, and twenty-

year endowment), their use tends to produce higher minima for ages 20 and 35 (e.g., averaging a \$6 increase in the third year), about the same minima at age 50, and lower minima at age 65.

The minimum values and adjusted premiums based on test expense allowances serve as a standard from which to measure the effect of changes in mortality and interest.

A. Interest.

Since we propose in Chapter XV minimum cash values independent of reserve interest assumptions and of the interest rate actually used in the policy, it is necessary to choose an interest rate for test purposes, even though the determination of the rate was not a task for this committee. (The Executive Committee of the Society of Actuaries at its meeting in February, 1974, decided to assign this to the Committee on Economics and Finance.)

In testing the effect of a change in interest rates, it is convenient to test a 1 per cent differential. A rate of $3\frac{1}{2}$ per cent having been used for test purposes elsewhere in this report, a $4\frac{1}{2}$ per cent rate was selected for this section.

Appendix E compares minimum cash values and adjusted premiums at $3\frac{1}{2}$ per cent interest with those employing $4\frac{1}{2}$ per cent. The 1958 CSO table is the basis for mortality. Test expense allowances are used. The effects of an increase of 1 per cent (from $3\frac{1}{2}$ to $4\frac{1}{2}$ per cent) in the maximum interest rate will have the following impact:

Adjusted premiums: Decreases range from under \$2 (whole life at the young ages) to just over \$4 (twenty-payment life plan, most ages).

Minimum cash values: A 1 per cent increase in the interest rate has a greater effect on minimum values than does a modernization of mortality, as will be seen shortly. Decreases are quite substantial—whether measured as a percentage decrease or on an absolute basis. Twenty-payment life, issue age 20, exemplifies such decreases: 85 per cent decrease (from \$6) at duration 2 and an \$80 decrease (from \$355) at duration 20. The decreases (on an absolute basis) are greatest for twenty-payment life, lower for twenty-year endowment, and lower still for whole life.

B. Mortality.

To limit our tests to the effect of modernizing mortality, we have followed entirely the methods of developing the 1958 CSO table, employing medically underwritten standard ordinary mortality with the same formula for margins (discussed later in this chapter).

The effect of employing this "Modern CSO" table can be seen in Appendix F, where adjusted premiums and minimum values are

compared with 1958 CSO values using, in both cases, $4\frac{1}{2}$ per cent interest and test expense allowances.

In summary, a modern mortality table has the following effect:

Adjusted premiums: The amount of reduction in adjusted premiums ranges from zero (twenty-year endowment at the young ages) to nearly \$4 (whole life at the higher ages), or from 0 per cent to about 8 per cent.

Minimum cash values: Twenty-year endowment exhibits very little change except at the higher ages, where there are small increases. For the two life plans, there are generally small decreases at the high ages. At the younger and middle issue ages for these two plans, there is a moderate decrease in minimum values—less than a \$5 decrease for durations 5 and under, peaking to about a \$15–\$20 decrease at the middle durations.

C. Comparison with Current Minima.

It seems appropriate to show the total impact on current cash-value minima if mortality, interest, and expense allowances are all changed. This is accomplished in Appendix G, where current $3\frac{1}{2}$ per cent values for whole life are shown next to those from Appendix F (modern mortality, $4\frac{1}{2}$ per cent interest and test allowances).

To make this comparison meaningful, a further adjustment is needed: In developing the figures for Appendix F, test allowance percentages were applied to Modern CSO, $4\frac{1}{2}$ per cent net premiums. However, these percentages were developed from 1958 CSO $3\frac{1}{2}$ per cent net premiums. Additional columns were therefore added employing expense allowances derived by applying the percentage of premium allowance to 1958 CSO $3\frac{1}{2}$ per cent net premiums (called “frozen allowance”).

Symbolically, the adjusted premium underlying the values in column 3 of Appendix G is (for whole life only):

$$P_x^a = P_x^{4\frac{1}{2}\%/Modern\ CSO} + \frac{E'_0}{\ddot{i}^{4\frac{1}{2}\%/Modern\ CSO}},$$

where

$$E'_0 = \left[\begin{array}{c} P_x^{3\frac{1}{2}\%/1958\ CSO} \\ 0.05 \end{array} \right] + 0.01.$$

It is readily apparent that minimum cash values will be significantly reduced if mortality, interest, and expense are modernized to the degree of our test factors. This result is not surprising, since an increase in interest rate assumptions from $3\frac{1}{2}$ to $4\frac{1}{2}$ per cent (and to a lesser extent the lower mortality assumptions) has a very significant downward effect on the net premiums and cash values involved. Recogniz-

ing that our test expense allowances are too low to be representative of the cost levels of many companies, modernizing expense allowances to accommodate such companies would result in further cash-value reductions.

On the other hand, reduced paid-up values will be larger and extended term periods longer per dollar of cash value.

D. Additional mortality considerations.

In addition to a modern replication of the 1958 CSO table, the committee considered certain questions related to mortality assumptions, as described below.

1. Mortality margins.

Appendix H compares the mortality rates of our modern mortality table ("Modern CSO") with those of the 1958 CSO. The Modern CSO rates are lower except at ages 22–29, where there has been increased accident mortality.

The margins in the Modern CSO per thousand are 0.75 plus 0.01*x* for ages 32 and younger, grading into 15 per cent of the basic mortality rates at ages 62–92. Numerically the margins at the young ages are the same as under the 1958 CSO table, but, as a percentage, they are generally greater for the new table. The margins at the older ages are based on the same percentage and are therefore somewhat reduced in absolute terms. Appendix I compares the margins in the 1958 CSO with the margins in the Modern CSO.

The reasons given in the late 1950's for including margins in a mortality table designated as a minimum standard for valuation purposes were as follows:⁴

The exposure period (1950–54) was extremely favorable from a mortality standpoint, and there was no assurance that future experience would be as favorable.

The table reflected, in large measure, the conservative underwriting practices of the late 1930's and the 1940's. More recent liberalizations in underwriting, designed in part to offset increases in the cost of underwriting, could be expected to produce higher mortality in the future.

It was thought that the tendency toward lower-premium forms of insurance, with correspondingly longer premium payment periods, might produce higher mortality in the future, as studies had shown that mortality at the older ages is higher on premium-paying than on paid-up policies.

As some companies expected to issue insurance to females on the basis of an age setback, it was likely that the table, although constructed

⁴ SOURCE: Society of Actuaries, Part 5 Study Notes, 54.18.71.

using the experience of both sexes, would be used principally as a male table.

Individual companies with variations in the classes of business written could be expected to produce results at variance from the average. This was true among the companies which contributed to the experience, and even greater variation could be expected in the experience of smaller companies operating on a regional basis.

Reasons similar to at least some of the above would apply in today's environment.

If we consider the question of nonforfeiture values apart from any valuation considerations, there is at least one good reason for including margins in the table—that is to provide for expenses of maintaining paid-up insurance benefits (paid-up benefits are discussed further in Chap. XV).

2. Effect of margins on values.

Assuming that a valuation table were adopted with margins deemed appropriate, it would be most practical and convenient to use the same table for nonforfeiture values. This avoids seriatim testing to ensure that reserves exceed cash values, an apparent requirement stemming from a "general interrogatory" in the Annual Statement Blank.

If, however, valuation standards were changed so that some other means were employed to provide for adverse fluctuations, and a table without margins were to be adopted for valuation purposes, then convenience would call for the use of the same table for nonforfeiture benefits. Obviously, under those circumstances, a different means would be needed to provide for expenses on paid-up benefits.

The effect on nonforfeiture values of a table without margins (Basic Table) was explored with the results given in Appendix J.

The effect that the inclusion of margins has on minimum values would appear to be related to the magnitude and slope of the margin chosen and the plan and policy duration in question. Accordingly, any conclusions to be drawn with respect to the impact of margins on minimum values should be so qualified. In summary, going from the Modern CSO table with the margins described to a table without margins means the following:

Adjusted premiums: For twenty-year endowment there is a small effect (2-7 per cent decrease). For the other two plans the decrease ranges from roughly \$1 for whole life, age 20 (16 per cent), to \$5 for whole life, age 65 (9 per cent).

Minimum cash values: For twenty-year endowment there are very small increases (generally \$3 or less), except that age 65 shows small decreases. For whole life there is little effect in the early policy years, with decreases in the 3-4 per cent range at the later durations. Twenty-payment life values tend to be slightly lower in the early years and significantly lower (4-10 per cent) when the policy becomes paid up.

3. Female mortality assumptions.

To reflect the lower mortality of female lives, companies have universally reduced premiums, some have liberalized underwriting, and others also adjust nonforfeiture values. The Standard Nonforfeiture Law permits the use of a three-year age setback for determining cash and paid-up insurance values.

The fact that some companies do not find it necessary to have different cash values for males and females underlines the comments in Chapter VII to the effect that cash values are but one aspect of the benefit-pricing structure. One argument for lower cash values for females is that further premium reductions are thereby made possible and greater consistency is achieved in the portfolio.

Perhaps the most important reason for different mortality assumptions stems from the fact that lower gross premiums for females may result in deficiency reserves unless lower valuation net premiums are also permitted. While nonforfeiture values are involved only indirectly, it seemed appropriate to consider this additional aspect of modernizing mortality.

Separate male and female mortality tables were therefore constructed, using very approximate methods, and the results are shown in Appendix K.

In Appendix L minimum values for males and females are compared with those in a combined table, assuming test expenses and $4\frac{1}{2}$ per cent interest. These test minimum cash values are generally higher for males than combined table values and lower for females.

Appendix M compares values on two age setbacks, three and six years, with combined table values. When these results are compared with those in Appendix L, it is apparent that the three-year age setback is not a satisfactory approximation to a separate female table. By contrast, a six-year setback is a good approximation on the whole life plan. In practical terms, a six-year setback is preferred over separate tables, but there may be contrary philosophical or political reasons that the committee has not considered.

The six-year setback may or may not be appropriate for other plans.

4. Select and ultimate tables.

A series of select and ultimate tables produces minor effects on cash values, according to tests performed by the committee. In our view, the refinement of select and ultimate tables is inappropriate in an area that is characterized by approximations.

Substandard Business

For insurance issued on a substandard basis, the current Standard Nonforfeiture Law provides that adjusted premiums and present values "may be based on such other table of mortality as may be specified by the company and approved by the commissioner." This provision does not clearly permit other actuarial treatments which accommodate innovative plan design for risks not insurable at standard rates.

As an example, the following common practice should be permitted: For a plan with graded benefits (DB_t) applicable to the substandard risks, with premium and cash values equivalent to the standard plan's values,

$$DB = CV_t + \frac{1}{n} (1,000 - CV_t) ,$$

where n is the ratio of the assumed substandard mortality to standard mortality and CV_t is the *payable* cash value.

The rationale for this grading is probably apparent. The net amount at risk ($1,000 - CV_t$) has been reduced in direct proportion to the assumed increased mortality. Thus the out-of-pocket claim expense in policy year t is the same for the standard and the substandard classification.

Out-of-pocket claim expense

$$= q(1,000 - CV_t) = nq \frac{1}{n} (1,000 - CV_t) .$$

It should be noted that this method ignores the effect of the graded benefit on the excess initial expense allowance; however, this "oversight" causes only a slight understatement of minimum values. Besides, the additional underwriting effort and generally lower average size associated with substandard business tend to offset this distortion.

Other methods are possible, and it would be desirable to spell out a sufficient number of these methods in the law so as to simplify the process of supervision without sacrificing legitimate plan design.

XIV. TRIVIAL VALUES, TERM INSURANCE, SUPPLEMENTAL BENEFITS, SEVERABILITY

Three apparently disparate subjects discussed by the committee are brought together in this section:

1. Minimum nonforfeiture values for term insurance.
2. Minimum nonforfeiture requirements for supplemental benefits.
3. Avoidance of insignificant or trivial nonforfeiture values created by nonforfeiture regulation.

Close study revealed that all three topics are tied together, with the first two nothing more than specific instances of the third. Term insurance policies tend to generate relatively small minimum nonforfeiture values under the standard formula. If supplemental benefits, often providing coverages quite different from those included in the basic policy for relatively small additional premiums, were made subject to minimum requirements according to the nonforfeiture formula, their presence and impact upon the basic policy would restrict very desirable flexibility while generating little in the way of additional nonforfeiture value.

Test of Triviality

It is not desirable that a policy be made to provide trivial nonforfeiture values. Apart from adding an unwieldy dimension to what would otherwise be a simple product concept and policy form, the cost of maintaining and paying the nonforfeiture benefit would be high in comparison to the economic benefit conferred upon the policyholder. The law as it now stands recognizes this principle by excluding from its scope certain supplemental benefits such as total disability and accidental death and dismemberment. In addition, the law exempts many term plans and term riders.

Another principle to be recognized is the desirability of having *simple* tests for determining whether or not an exemption applies to a particular policy or supplemental benefit. The criteria granting an exemption for many forms of term plans and benefits are relatively simple to use; the outright exemption of certain other classes of benefits is straightforward. In devising these tests, the law must sacrifice some degree of theoretical perfection in favor of the practicalities of business. We therefore propose a test of *triviality*: if statutory minimum cash values do not exceed some small amount, such as 3 per cent (or 4 per cent) of the death benefit at any duration, then values are not required.

While at first glance this exemption test would appear to be highly efficient, it is not simple to apply. Before one can be certain whether or not a policy is exempt, nonforfeiture values according to the minimum

standard must be calculated for a number of durations. Second, this test permits discontinuities between adjacent issue ages, where at one issue age all values according to the minimum standard would be less than 3 per cent of the death benefit, leading to an exemption, and at the next all values would have to be included because one was greater than 3 per cent. We do not regard these as serious objections. The question can also be asked as to whether triviality should be determined on a per policy basis. The logic behind the per policy criterion would be that a nonforfeiture value of any given amount should have the same economic value to a policyholder no matter how big his policy was. On the other hand, triviality can be viewed relative to the size of the policy initially issued: the bigger the policy, the bigger must be any nonforfeiture value to be considered nontrivial. In viewing these two possible approaches, the committee opted for the latter.

Exemption for Term Insurance

In addition to the principle of triviality, nonforfeiture requirements should reflect the basic *nature of the coverage* to the largest practical extent. This is particularly applicable to term insurance, where the coverage is fundamentally for protection and the degree of prefunding inherent in the level premium tends to be minimal. Further, asset shares (after profit) rise and then diminish as the coverage approaches expiry.

The law in its present form includes two arbitrary but efficient criteria for the exemption of term insurance policies. Nonforfeiture values are not required for level term policies of fifteen years or less expiring before age 66, nor for decreasing term policies where the adjusted premium is less than the adjusted premium for a fifteen-year level term policy issued at the same age for the same initial amount of insurance. These tests are arbitrary in that the parameters contained in them could have had other values; they are efficient in that they are easy to apply and the matter of an exemption is easy to determine.

With respect to the parameters, in view of the fact that it has become increasingly common to offer term coverage to attained age 70, it is suggested that the age 66 parameter in the level term test be raised to 71. Also to be considered would be the extending of the fifteen-year term parameter to twenty years. Exemption of term plans satisfying the current criteria has the effect of creating inconsistencies in nonforfeiture value requirements for other relatively similar policies. It is possible, for example, to have minimum nonforfeiture values required in a twenty-year term policy issued at age 40 that are smaller than the values that would have been required in a fifteen-year term policy issued at age 50

had the exemption not been granted. By raising the parameters in the exemption, the incidence of such inconsistencies would be reduced.

Reduced Paid-up Insurance for Small Amounts

A reduced paid-up insurance benefit at a duration when the cash value is small results in a small amount of long-term coverage that is highly uneconomical to provide. The same is not true of extended term, which is for the full face amount less any loan. It is recommended that the insurer be allowed to substitute extended term for the reduced paid-up benefit at the time of lapse, provided that the paid-up benefit is not greater than some predetermined amount such as \$1,000.

Supplemental Benefits and the Principle of Severability

Supplemental benefits fall into two categories:

1. They are not life insurance or endowment benefits, or
2. They are life or endowment benefits which are provided for separately, included at the option of the insured, and carry an identifiable premium.

The importance of supplemental benefits in the marketplace has grown over the years to the point where a significant portion of policies sold carry significant amounts of various forms of additional coverages. The treatment of supplemental benefits under the law recognizes the doctrine of triviality in that the economic value of these benefits is often small when compared to that of the basic policy.

We recommend that supplemental benefits continue to be exempted from nonforfeiture requirements if

1. They fall in the first category above, or
2. They fall in the second category above and they are such that they would not require nonforfeiture values if issued as a separate policy.

The list of exempted benefits in the current law includes accidental death, disability, reversionary annuities, term insurance exempt if issued separately, children's term, and "other policy benefits additional to life insurance." This has been satisfactory language (although consideration should be given to expanding the list; for example, guaranteed purchase options could be specifically mentioned).

Turning now to benefits which fall in the second category and are such that they would require nonforfeiture values if issued as a separate policy, we propose that the principle of severability, as exemplified in the exemption of term riders, be expanded as follows: Supplemental benefits should not be required to give rise to greater values than if issued as a separate policy. As corollaries, (1) negative minimum values for a supplemental

benefit should not be allowed to offset positive values arising from other policy benefits, and (2) the minimum cash value for a policy with supplemental benefits is the sum of the minimum for the policy and that for the supplemental benefit (this would permit flexibility, e.g., values on the policy in excess of the minimum could be applied toward meeting the minimum on the rider).

This principle would have its greatest impact on supplemental term insurance. Under current law, the initial expense allowance granted the supplemental term benefit when tested as a policy is a function of the equivalent level amount of insurance contained in the term benefit. That equivalent level amount is obtained by spreading the coverage not over the period of the term rider but over the period of the base policy. The net result is that, for term riders attached to policies that continue past the end of the term period, the expense allowance is considerably larger for the corresponding term policy. When the supplemental benefit is required to provide nonforfeiture values, the minimum is higher than would be applicable if the benefit were issued directly as a policy. Second, the minimum value applicable to the supplemental term benefit will depend upon the nature of the underlying base policy. Since a concept underlying many supplemental term benefits is that they should be available to the purchasers of a variety of base policies, the law in its current version impedes their utilization. While there is some justification for lower policy establishment expenses on a rider, the difference bears no relationship to that derived from spreading out the coverage. It is recommended that severability apply to supplemental term benefits, bearing in mind our suggestion in Chapter XII that equivalent level amounts be determined over the first ten policy years.

Definition of Term Insurance

A renewable term policy can be viewed either as a series of short terms or as a long-term policy with increasing premiums. In the latter case, the exemptions for term insurance may not apply and cash values may develop. We view this as contrary to the basic nature of the coverage and recommend that renewable term policies (or riders) be treated as a series of separate term policies for nonforfeiture purposes.

Convertible term policies are obviously term policies prior to conversion and the converted-to policy thereafter. These would seem to present no problem for nonforfeiture purposes, but there is an ambiguity that develops when a term policy is automatically convertible. Is it a term policy followed by a permanent plan or, in fact, a modified premium permanent policy?

The committee suggests that this be resolved based on the nature of the coverage and treated as term followed by permanent. We recognize, however, that it is not always possible to distinguish a modified premium policy, nor is it beyond belief that companies will produce policies with a slight modification of premium at a late duration, say year 10, and declare the contract to be term followed by permanent insurance.

We do not believe any special legislation is necessary to resolve the ambiguity: each contract must contain a brief description of its nature; it should be treated for nonforfeiture purposes as the coverage it declares itself to be. To curb the abuse described above, it is only necessary for the regulator to examine the premium for the policy after "conversion." If it is substantially lower than a new issue on the permanent plan at attained age, then it is a modified premium policy; otherwise, it is term followed by permanent.

Deposit Term and Other Special Cases

Deposit term and deposit whole life will illustrate the committee's proposals. In deposit term cases, the policyholder pays an initial "deposit" as earnest of his intentions to keep the policy in force for a selected period of years, on the order of eight or ten. If he fulfills this undertaking, his "deposit" is returned to him increased by what is often alleged to be interest but is, in reality, both interest and the reversions of the terminations from the tontine-type agreement.

The initial deposit is an integral part of the policy rather than a supplemental benefit (if it were supplemental, it would qualify for exemption as a pure endowment). Since it is not a simple term policy, it would not qualify for exemption under the exemption rules of term. Therefore, the normal adjusted premium method would apply. (For an illustration of the minimum values as affected by changed expense allowances see Appendix N.)

Deposit whole life is similar, but the term is converted automatically to a whole life plan at attained age in lieu of payment of the augmented deposit in cash. In this case, the plan is whole life after conversion and deposit term before. Therefore, after conversion the values of the whole life policy should be at least the minimum for an attained-age whole life plan augmented by the value of the deposit. (This implies that cash values at some point would exceed whole life reserves.)

A comment should be made regarding split life: with regard to the term portion, the committee sees no nonforfeiture problem (although the valuation question needs to be explored elsewhere); with regard to the

annuity portion, the nonforfeiture problems should be resolved if the committee's recommendations in the annuity section are adopted.

XV. SINGLE INTEREST MINIMUM, PAID-UP, SINGLE PREMIUM LIFE

A. Cash-value interest rates.

The current Standard Nonforfeiture Law contains a passage as follows: "all adjusted premiums and present values . . . shall be calculated on the basis of . . . the rate of interest . . . specified in the policy for calculating cash surrender values." In other words, the set of minimum cash surrender values applied to a particular contract is fixed by the rate of interest specified therein. Further, that rate of interest is, typically, the same as the valuation rate of interest, with special requirements for participating insurance if the two rates differ by more than $\frac{1}{2}$ per cent.

Thus there are at least three interest rates to be considered: (1) the interest rate for statutory minimum cash values; (2) the interest rate used for the actual policy cash values (that "specified in the policy"); and (3) the valuation interest rate. We recommend that there be a single interest rate for the first that would apply to all plans of all companies. Assuming the same mortality, this implies that the rate for the second would be no higher than that for the first. We further recommend that the rate for the third (valuation) be no higher than either of the other two. Symbolically, $(1) \geq (2) \geq (3)$.

Our reasons stem from a desire for simplicity, uniformity, and convenience. Minimum cash values based on a single interest rate would eliminate the current multiplicity of minimum-value tables, would assure every purchaser of a minimum set of cash values no matter what company he bought his policy from, and would force reserve calculations to employ an interest rate that will produce net level premium reserves at least equal to cash values which will avoid special tests to ensure that the condition is met.

Further, a single set of minimum cash values tied only to the benefit structure should be more easily administered by regulators and would cure an anomaly in the present law under which the expense allowance at issue is higher if the specified interest rate is lower.

B. Paid-up insurance option.

"The determination of the level of nonforfeiture benefits is only part of the problem. Suitable bases must be determined for conversion of the equitable amounts available into the appropriate amounts and forms of nonforfeiture benefits available as insurance."—NAIC report, page 149.

1. Interest assumptions.

We have proposed a single interest rate for minimum cash values. For the purpose of the following discussion, assume a relatively high interest rate for cash values on a given plan. If a policy's actual values are on a lower interest basis, what is the appropriate interest rate for statutory minimum insurance options? There are at least the following possibilities:

- a) Specify no interest basis but require only that the reduced paid-up amounts, or the extended term period, be at least as favorable as the statutory minimum (i.e., those insurance amounts or terms derived by applying the statutory minimum cash value on a basis assuming the statutory maximum interest rates). This entirely removes the requirement of any relationship between cash values and the present value of paid-up insurance. Cash values immediately after lapse could be considerably different from those at time of lapse. The cash value is a benefit of the policy paid for by the insured; it would be unfair to reduce that value arbitrarily because his policy was changed (perhaps automatically) to paid-up insurance.
- b) Require the actual cash value to be applied at the statutory maximum interest rate for determining minimum paid-up insurance values.

This would give the greatest insurance protection to the insured. On the other hand, it would provide the least margins for maintaining that insurance in force and would force an actuary who believes a lower interest rate is necessary for soundness to compensate through pricing and establishment of special reserves. The anomaly of higher death benefits after lapse (on a policy nearing paid-up status) than before must also be considered.

- c) Require the same interest rate for insurance options as used for cash values. The virtues of this method are that it is the same as in the current law and maintains a cash-value curve consistent with that before lapse (if a different interest rate is used, cash values after lapse will be different, even though they start and end at the same point).
- d) Use an interest rate no lower than that used for cash values. Other things being equal, this maintains cash-value parity just before and after lapse, permits the actuary to provide insurance on the same basis as in the policy, and yet allows

for more liberal amounts or terms of insurance if the company wishes to offer them.

We recommend the fourth method above for the insurance options *guaranteed* in the policy. If the interest rate is at least as great as that actually used in the policy, cash values after lapse would be the present value of the insurance on that interest basis.

The practical result of such a practice is evidenced by the following table in which paid-up insurance amounts for \$100 of cash value are compared using a 1 per cent interest differential.

ATTAINED AGE	ILLUSTRATIVE PAID-UP INSURANCE VALUES*				% INCREASE
	Interest at 3½%		Interest at 4½%		
	Net Single Premium	\$100 ÷ NSP (Reduced Paid-up)	Net Single Premium	\$100 ÷ NSP (Reduced Paid-up)	
25	0.222	\$450	0.154	\$649	44%
30	0.255	392	0.182	549	40
35	0.294	340	0.217	461	36
40	0.340	294	0.260	385	31
45	0.391	256	0.310	323	26
50	0.448	223	0.367	272	22
55	0.509	196	0.430	233	19
60	0.573	175	0.498	201	15

* Basis: Modern CSO, Curtate, Age Nearest Birthday.

Likewise, any array of extended term values would show longer periods of coverage for higher assumed interest rates.

2. Mortality.

Again dealing only with minimum values guaranteed in the contract, the committee sees no reason to change mortality tables after lapse for reduced paid-up insurance. Extended term mortality experience is poorer than paid-up. Therefore, it seems reasonable to use higher mortality assumptions for the extended term guarantees along the lines of the CET table.

3. Expense.

Expenses on insurance options on lapse must be provided through interest or mortality margins. While this is an imprecise method, it would be no more precise to substitute a specific expense loading on an option that may not come into being for many years. The committee suggests continuance of current methods for expenses on guaranteed insurance options on lapse.

4. Mathematical equivalence.

The current law requires that insurance options have a present value equal to the cash value. For guaranteed benefits, this equivalence is recommended to be continued, with the above-described latitude in interest rates and extended term mortality.

If, however, a company wishes to make available larger amounts of reduced paid-up or longer periods of extended term, it should be freed from the mathematical equivalence requirement. The company might, for example, be willing to provide paid-up insurance on the basis of its then current single premium life insurance rates, with perhaps some discount. Alternatively, a nonparticipating option may be substituted for the participating option guaranteed in the policy, on favorable terms.

There is precedent for such practice in settlement options under which many companies will substitute a current option for that guaranteed in the policy: Often the substitute option is nonparticipating and is based on some discount from the company's then effective annuity rates. Carrying such a practice directly to paid-up insurance is not currently feasible because of the mathematical equivalence requirement. If a company were to provide a larger amount of paid-up, it probably must, on subsequent surrender, provide the present value based on the mortality and interest guaranteed in the policy. Such present values should be based on the assumptions underlying the more liberal insurance option.

It should be noted that it is likely that anomalies can occur. A twenty-payment life contract could become fully paid up in less than twenty years. Thus the "reduced" paid-up amount could exceed the face amount (which, in the absence of loans, is also the amount of extended term), and death benefits after default could exceed those during premium-paying status. These are not insuperable obstacles (e.g., participating insurance may now become paid up before the end of the premium-paying period), but legislative proposals would need to be drafted with these situations in view.

It is also to be noted that, if paid-up insurance on lapse is purchased on a current basis, it may involve a loading which would cause cash values immediately after lapse to be less than at time of lapse. This is an undesirable feature but will not be important if the declines are modest and the insured is favored with commensurate improvements in his protection.

C. Paid-up dividend additions.

Under the Standard Nonforfeiture Law these are treated identically with reduced paid-up insurance options. Amounts are small, but because of interest and mortality margins the additions themselves are participating. For the same reason that more liberal paid-up should be permitted, companies should be permitted to offer more liberal paid-up additions than guaranteed in the policy and should be permitted to guarantee more generous paid-up additions than if the cash-value interest rate were required to be used.

D. Disclosure.

The law requires a paid-up insurance option on termination, and it further requires an extensive array of values in the contract. If such values can conveniently be shown in the contract for some period such as twenty years, they should be. Numerical values are useful to the policyholder, his attorney, and regulators. If, however, the array would be unduly complex or if policy options make it difficult to say precisely what those benefits are, they should not be required to be shown. A table that will be obsolete in a year or two because of some policy change is of little use to anyone.

As an example, consider a policy that is linked to the consumer price index, an unknown parameter. If the contract shows values assuming a particular (or no) change in the CPI, it will have no meaning after the first year. To encourage experimentation in the public interest, only the interest and mortality guaranteed and the basis of such options should be described in the contract. For example, the policy should spell out whether the extended term amount is fixed at lapse or varies as to amount and period thereafter. A detailed statement of method should be filed with the insurance departments, and the company should undertake to notify the policyholder at lapse of his options and periodically during active status.

E. Single premium life.

Single premium policies have never been sold in volume. One may view a single premium whole life or endowment policy, priced using today's new-money interest rates, as an attractive combination of life insurance and with a reasonable investment element. However, the Standard Nonforfeiture Law currently requires cash values higher than the experience gross premium.

The question raised is whether the public would benefit by a liberalization of cash-value requirements, following the recent precedents established in the liberalization of interest requirements for single premium annuity reserves. The circumstances are not parallel,

in that single premiums for annuities may be immunized by appropriately controlling investments in relation to the maturity of the company's obligation under the annuity. Single premium life on younger insured lives clearly involves reinvestment problems. For conservatism, the appropriate maximum interest rates for single premium life insurance *reserves* may be lower than that for annuities. As indicated elsewhere, the committee does not endorse the identity of reserve and nonforfeiture interest rates. We propose that a maximum nonforfeiture interest rate for single premium life be set from time to time for new issues for the sole purpose of guaranteeing nonforfeiture values. Under current conditions, such a rate would be on the order of 6 per cent or conceivably higher. The cash value would merely be the present value of future benefits on the specified mortality table at the designated nonforfeiture interest rate.

XVI. ANNUITIES

Each annuity contract has a benefit period and, except under an immediate annuity, an accumulation period. Nonforfeiture procedures for these two stages will be discussed separately.

Benefit Period

Under present law, nonforfeiture values are not required during the benefit period and, in the committee's opinion, should not be, for both theoretical and practical reasons.

From a theoretical viewpoint it can be argued that there is really nothing for the annuitant to forfeit during the benefit period. During such period he is receiving the actual benefits for which he contracted. There is no way these benefits can be lost to him, provided only that the company is financially able to meet its contractual obligations.

A practical reason for not requiring nonforfeiture values during the benefit period is the difficulty in preventing antiselection of a severe nature. If, as is typically the case, the payout option involves mortality, the annuitant on his deathbed would be best served by withdrawing his cash value. In order to prevent this, there would have to be a requirement that the annuitant furnish satisfactory evidence of insurability (or at least evidence of nondeterioration of insurability) before a cash withdrawal could be made. Such a requirement would seem quite incompatible with a statutory provision for minimum cash surrender values.

Accumulation Period

During the accumulation period of deferred annuity contracts (commonly referred to as retirement annuities), nonforfeiture values would

seem to be appropriate for the same reason that they are for life insurance policies. In addition to the question of proper magnitude for such values, there is the question of whether the values should be in the form of both cash and paid-up annuity values (analogous to life insurance) or only in the form of paid-up annuity values (as under present New York law). It can be argued that possible severe investment antiselection makes a guaranteed cash-value option inappropriate for deferred annuity contracts. However, the committee does not feel that such considerations are serious enough to warrant eliminating cash values as a required nonforfeiture benefit in normal circumstances.

Little precedent can be found in existing law for fixing the magnitude of minimum values on deferred annuities during the accumulation period. Aside from the New York and New Jersey laws, which are analogous to the law for life insurance and define minimum nonforfeiture values by a prospective adjusted premium formula, only a few other states have laws on this subject at this writing. Of these, the laws of Washington and Maryland have certain accumulation features, but they are not examples of the retrospective approach. In spite of the lack of precedent, the committee feels that the accumulation method has the greater merit for deferred annuities, in that it is more readily understood by the public and easier to apply from a regulatory standpoint. The remainder of this section, therefore, discusses only the accumulation method.

Statutory minimum cash values for deferred annuity contracts can be rather simply expressed as the accumulation with interest of a percentage of the gross premiums actually paid, after first deducting the policy fee, if any. The committee did not undertake to recommend specific factors for use in this minimum-cash-value formula. However, it does feel that such factors should reasonably reflect current industry practice. Reasonable guidelines for determining these factors might be as follows:

1. *Interest:* The committee feels that a single interest rate should be used to determine minimum cash values for deferred annuity contracts. This would be consistent with the committee's recommendation of a single set of minimum values for life insurance policies. It would also head off a possible trend toward issuance of annuity contracts with less liberal interest rate guarantees so as to permit lower minimum cash values. We feel that some reasonably conservative long-term interest rate such as 3 per cent would be appropriate for minimum-value purposes using a retrospective accumulation formula.
2. *Policy fee:* The amount of any policy fee to be subtracted from the gross premium before application of the accumulation percentages should probably be subject to some reasonable maxima. Otherwise, companies might attempt to evade the law by quoting exorbitantly high policy fees. Regulators should

have the authority to change these maximum policy fees from time to time for new issues to take account of any inflation in expenses.

3. *Gross premium percentages for accumulation purposes:* The committee recommends that a single set of gross premium percentages be used for determining minimum cash values. These would not vary between participating and nonparticipating policies as is currently true in the state of Washington. They would, however, vary between single premium and annual premium contracts and between first year and renewal years for annual premium contracts. The percentages to be used should be reasonably consistent with the loading patterns under currently issued deferred annuity contracts. They should provide ample margin for covering reasonable acquisition and administrative costs and also reasonable provision for profit and dividend margins and the cost of annuity guarantees. Although the committee does not recommend what these percentages should be, they would appear to fall somewhere in the following ranges:
 - a) Annual premium contracts: From 60 to 75 per cent the first year, and from 85 to 90 per cent for renewal years.
 - b) Single premium contracts: From 85 to 90 per cent.

Flexible Premium Annuity Contracts

Flexible premium deferred annuity contracts, which have become quite popular in recent years, present a unique regulatory problem in terms of minimum-cash-value requirements. Use of a loading pattern for cash-value purposes which varies between first and renewal years can create the potential for serious inequities. The basic problem is that an equivalent amount of premium dollars paid into two contracts over the same number of years can produce quite dissimilar cash values depending on whether the payments are made in lower or higher loading years. Some of the alternative approaches considered by the committee to solve this problem were as follows:

1. *Level loading pattern:* This approach is now used by a number of companies and would appear to adequately solve the above conflict-of-interest problem. However, it should be recognized that, to the extent that this approach does not provide an adequate margin for first-year expenses, it may create a potentially severe financial strain on the company. One possibility would be to use a level loading pattern but combine this with a permissible scale of surrender charges decreasing with duration.
2. *Percentages set in terms of total premiums paid to date:* There would be some logic in setting the gross premium percentages for cash-value accumulation purposes in terms of total premiums paid to date. For example, the same loading percentage might apply to the first \$2,000 of premiums paid, whether this is \$1,000 the first year and \$1,000 the second year or \$500 the first year and \$1,500 the second year. A problem with this approach is that there is no

natural breaking point for loading percentages which would fit all sizes of policies.

3. *Open policy concept*: A concept which might have merit but which was not fully explored by the committee would begin by applying the loading percentages developed for level premium deferred annuity contracts to flexible premium annuity contracts. However, there would be an additional loading percentage permitted during any policy year in which a premium increase occurs. This would be analogous to the recommendation in other portions of this report for the open policy type of life insurance contract. A problem with this approach would be in defining what constitutes a premium increase for purposes of increased expense allowance. A somewhat different approach would be to treat each increase in premium payment above some specified level as the purchase of a new single premium deferred annuity contract for minimum-cash-value purposes.

The committee feels that further study is needed in the area of minimum nonforfeiture value requirements for flexible premium deferred annuity contracts, including consistency with similar requirements for level premium deferred annuity contracts. The flexible premium deferred annuity contract would appear to be more desirable from the buyer's standpoint than is a level premium contract. Thus its use should not be unduly hampered by laws or regulations. The minimum nonforfeiture value formula applicable to it should permit payment of reasonable compensation to the agent for selling the contract and should not place an undue financial strain on the company issuing the contract.

XVII. ACCIDENT AND HEALTH INSURANCE

Accident and health insurance was not considered by the NAIC committee in its 1941 report, nor are nonforfeiture benefits required on traditional accident and health insurance products in the current Standard Nonforfeiture Law. Since the charge given our committee did not limit its activity to life insurance, it is appropriate to consider the subject of minimum nonforfeiture values for accident and health business.

In brief summary, some of the conclusions the committee has reached with regard to life insurance which may be relevant to considerations of health insurance are the following:

1. Nonforfeiture values arise from substantial prefunding of future coverage.
2. Asset shares are an appropriate and convenient measure of the "equity" in a contract.
3. It is desirable to avoid trivial nonforfeiture values.
4. The nature of the coverage provided should be preserved to the largest practical extent.

Health insurance may be broadly divided into medical care and dis-

ability coverages. In today's environment the degree of prefunding in medical care coverage is modest; although some contracts are still written with coverage to an advanced age, the combination of inflation in medical care costs and rate regulation make these coverages fundamentally renewable term. The nature of the coverage is purely protection. The committee regards nonforfeiture benefits as inappropriate.

The nature of disability income contracts is, similarly, pure protection. There is, however, a degree of prefunding which varies according to the term during which premiums remain level and, to a lesser extent, according to the benefit period. Disability income contracts are entirely term insurance, there being no counterpart to whole life coverage, where, in the absence of a claim, underlying reserves must ultimately reach the face amount of the contract.

Like term life insurance, active life reserves for disability insurance will tend to rise in the early part of the period during which premiums remain level and to decline to zero at the end of the coverage period. As with life term insurance, nonforfeiture values would not be considered unless, after appropriate expense allowances, distinctly nontrivial values resulted.

Such a situation occurs in life insurance on coverages intermediate between whole life and short term. We have recommended no values on term life coverages of less than twenty years' duration which expire before age 71; this seems a reasonable starting point for disability insurance.

For all practical purposes, disability contracts are written to expire before age 71. Policies issued below age 50 with at least twenty years in the coverage period, and to a large extent only policies issued at age 45 or below, are thus the only candidates for nonforfeiture values. The strongest argument for values in this range is the degree of prefunding: for example, for coverage terminating at age 65, disability income premiums at age 45 may be twice as much as at age 25, depending on elimination and benefit periods; these are about the same multiples as for life term to 65.

To test whether emerging values would be nontrivial, the experience of one nonparticipating company represented on our committee was examined. Gross premiums per \$1,000 on term life to age 65 for this company are almost exactly three times the rates per \$10 of monthly income on a typical disability policy (accident and sickness coverage and benefits payable to age 65, 90-day elimination—male—Class 1 was found to be reasonably representative). It would therefore seem reasonable to equate \$30 of monthly income to \$1,000 of life insurance on a term to age 65 basis. In the section dealing with trivial values, it was suggested that

a test for triviality might be 3 or 4 per cent of death benefit or \$30-\$40 per \$1,000 on a level term life policy. The asset shares of this company for the described disability policy for a \$30 monthly benefit using company expenses, company morbidity, and lapse experience and 6 per cent interest reached a maximum of

\$39 at duration 29 and issue age 25,
\$37 at duration 24 and issue age 30,
\$31 at duration 19 and issue age 35,
\$23 at duration 15 and issue age 40,
\$12 at duration 10 and issue age 45,
Negative at all durations at issue ages 50-60.

Although this example recognizes that there is an element of prefunding, it would appear that actual results indicate a level suitable for cash values which border on the trivial and only at relatively few durations. Thus the case for values would be a weak one.

The committee also considered the practicalities of cash values in disability insurance, assuming that a quantitative case could be made.

Disability coverages are enormously more complex than life coverages with different disability definitions, elimination periods, and benefit periods. Homogeneous morbidity data are often lacking, and published expense data are nonexistent. In practical terms, compiling data, enacting appropriate legislation, and administering a wide array of contracts presents a formidable obstacle to be avoided if equity can be served otherwise. As we pointed out in connection with life insurance, equity can be maintained through premiums if there are no cash values.

Currently, disability income contracts are priced on a basis that does not provide a benefit on lapse. If nonforfeiture values are required, there will be higher costs for the continuing policyholder. Some members of the committee also distinguish disability income insurance from life insurance in that the insured and beneficiary are often the same person. It may also be significant that an insured can be paid a claim *and* receive a surrender value on recovery from disability if nonforfeiture benefits were to be provided. Recognizing that the essential nature of the coverage is protection, the current system of maintaining equity through premiums seems to be adequate and even preferable.

The committee is not of the same mind on contracts with a return of premium provision. These contracts provide for a benefit, related to premiums paid, for survivors with superior claim experience. This introduces a type of endowment benefit which may well produce non-trivial surrender values which do not decline to zero at expiry. Nonfor-

feiture benefits may well be appropriate to such coverages if they continue to be offered to the public. There are, however, more fundamental questions concerning the basic soundness of those policies and their social desirability that are now being considered by regulators.

XVIII. MISCELLANEOUS ITEMS

There are a number of other, less important technical matters related to nonforfeiture benefits which are not specifically considered in this report. These would include such items as the following:

1. Refund of unearned premiums at death.
2. Fractional modes.
3. Age nearest and last birthday bases.
4. Family policies.
5. Uniform seniority rule.
6. Removal of any requirement for complex or confusing policy provisions relating to cash values—such as the basis clause, mortality table and interest rates, and nonforfeiture factor.

Although not dealt with by the committee in this report, these items should not be overlooked in any future revisions of the Standard Nonforfeiture Law.

APPENDIX A

RECOMMENDATIONS OF NAIC COMMITTEE TO STUDY
NONFORFEITURE BENEFITS AND
RELATED MATTERS (1941)

While the recommendations of the Committee, based on the text of this Report, and the conclusions enumerated above are to be implemented by proposed model legislation, it is important that these recommendations be set out in broad form. Those which may be placed in force by the adoption of the proposed model legislation are enumerated below as follows:

1. The elimination of the artificial relationship existing between the mortality and interest standards now specified for the valuation of policy reserve liabilities and the determination of nonforfeiture benefits. The same minimum nonforfeiture requirements should apply regardless of the basis or mode of valuation.
2. The elimination of the requirement for "mathematical equivalence" of the various nonforfeiture options on the basis of specific mortality tables and rates of interest, the elimination of any fixed period following issue during which nonforfeiture benefits need not be granted and the elimination of the concept of "surrender charge" as a penalty assessed against the policyholder for lapsing or surrendering his policy.
3. The recognition of the incidence of expense in conducting the insurance business, the special mortality rates characteristic of extended term insurance, the variations in mortality rates among different classes of insurance, the disregarding of selection, if any, at lapse and the use of the same formula for minimum nonforfeiture benefits for all classes of business.
4. Provision that expense of maintenance of insurance nonforfeiture benefits, as well as fluctuations in mortality, be covered by an appropriate margin to be added to mortality rates representative of recent experience. The maximum margin recommended at each age is one-sixteenth of the reciprocal of the curtate expectancy of life at that age.
5. Provision, in the calculation of minimum nonforfeiture benefits, for the amortization of the largest reasonable excess of initial over renewal expense that can be justified and provision that such excess be permitted to be amortized over the entire premium-paying period of the policy. The method recommended is the "adjusted premium" method with the adjusted premiums calculated so as to amortize (i) 40% of the first year's adjusted premium, (ii) 25% of the first year's adjusted premium on a whole life policy and (iii) \$20 per \$1,000 of the minimum amount of insurance during the term of the policy, with the provision that no adjusted premium shall be deemed to be more than \$40 per \$1,000 insurance in determining the amount to be amortized and with special conditions in the case of juvenile and other special forms of policies.
6. Provision that, subject to minor limitations, all policies shall provide for

cash surrender values during the premium-paying period and while in force under any fully paid-up insurance nonforfeiture option; and that payment of such cash surrender values may be deferred for not more than six months after demand therefor.

7. Provision that the fully paid-up insurance options shall have a net value, calculated on the bases specified in the policy for the calculation of the cash surrender value, of not less than the cash surrender value at the date of lapse, except in the calculation of an extended term insurance option when a special table with rates of mortality not exceeding 130% of the rates according to such bases may be used.
8. Provision for the wide use of the "surrender dividend" as an instrument for recognition of the excess, if any, of the amount of the accumulated funds on the policy over the cash surrender value specified in the policy at the time of surrender and as a means of making such adjustments as are proper because of excessive cash demands in times of crises.
9. A requirement that a surrender dividend attach when some earnings have been devoted to the building up of funds held against the policy substantially in excess of nonforfeiture benefits. Since the most important influences in building such funds result from substantial differences between the interest rates used in valuation of policy reserve liabilities and calculation of nonforfeiture benefits, such dividends should be required when the difference in such rates is at least one-half percent.
10. The use of mortality and interest bases appropriate to the policies to which they are applicable and the granting of authority to the commissioner to approve appropriate tables under adequate safeguards. The designation of specific tables as appropriate for the calculation of minimum nonforfeiture benefits such as (i) the Commissioners 1941 Standard Ordinary table, constructed by the Committee, (ii) the 1941 Standard Industrial table and (iii) the 1941 Substandard Industrial table. Provision for review of mortality experience and the revision of tables from time to time.
11. The continuance of present preliminary term methods for valuation of policy reserve liabilities only and the designation of any table of mortality appropriate for the calculation of nonforfeiture benefits as appropriate for valuation of policy reserve liabilities.
12. The establishment of the minimum aggregate policy reserve, regardless of the basis or mode of valuation, at an amount which is not less than the aggregate reserve when calculated on the basis of mortality table and rate of interest used in calculating the nonforfeiture benefits and the provision that the minimum aggregate may be calculated on the modified preliminary term basis specified in the statute if the appropriate provisions are contained in the policies of the company.

The model legislation presented in Chapter XII contains all necessary provisions for the adoption of the above recommendations. Certain other recommendations require action by the Association instead of legislation.

1. Recommendation is made for the revision of mortality tables from time to time. In order that appropriate data may be available, it is recommended that the Association request the Committee on Blanks to prepare an appropriate schedule whereby mortality data will be reported to each state insurance department as a part of its annual statistics. Suggestions as to the form of such a schedule appear as an exhibit in this Report.
2. The discretionary powers recommended to be conferred on commissioners with regard to the approval of mortality tables are broad. It is recommended that there be established within the Association a standing committee of insurance department actuaries whose function it would be to (i) advise on the recommendation of specific mortality tables by the Association for approval by the respective commissioners, (ii) advise on the periodical review of mortality and construction of revised tables of mortality and (iii) perform such other duties as the Association may specify.

The recommendations above are based on the findings and conclusions of the Committee. Necessarily, they are in general rather than specific form. In order to give these recommendations specific form, the Committee has drafted and included in Chapter XII certain proposed legislation which is presented as a part of this Report.

APPENDIX B

FOUR GENERAL APPROACHES TO PERCENTAGE OF PREMIUM FACTORS FOR PLANS OTHER THAN WHOLE LIFE

1. The simplest approach would be to use the same percentage allowance on all plans, possibly with some upper limit. Tests indicate a poor fit with current industry practice on cash values by plan.

2. Since first-year compensation is typically graded down as a percentage of premium as the premium per \$1,000 face amount increases over the whole life premium, one method of accommodating higher-premium plans is to provide a percentage allowance at the whole life level for that part of the premium not in excess of the whole life premium and for an allowance at a lower level—for example, at the level appropriate for endowments—for any excess. This produces a general formula of the following kind:

$$\begin{aligned} a(OL) + b(P - OL) & \quad \text{if } P > OL, \\ a(P) & \quad \text{if } P < OL, \end{aligned} \tag{i}$$

or, in the same form as the current law,

$$bP + (a - b) \left[\frac{P}{OL} \right], \tag{ii}$$

where P is the plan premium and OL is an ordinary life premium for the same age and amount. Those premiums may be either adjusted (P^a and OL^a) or

net premium (P and OL) as discussed in this report. Under current law, $a = 0.65$, and $b = 0.40$, and these factors are applied to the adjusted premium.

3. The above approach is somewhat arbitrary. It would be desirable, if possible, to improve consistency among plans by developing a formula that would embrace all plans from one-year term insurance to any permanent plan.

The premium for one-year term insurance is purely for the risk assumed by the company. Level premium plans for longer periods have an element of advance funding. As the insurance period lengthens with premiums remaining level, the degree of prefunding increases. It is convenient to consider any premium as consisting of a risk element plus prefunding element which exists in various degrees. If different compensation levels attach to these two elements, then a formula of the following type emerges:

$$aT + b(P - T), \quad (i)$$

or, more familiarly,

$$bP + (a - b)T, \quad (ii)$$

where T is the premium, adjusted or net, for a term insurance policy expiring on the date insurance ceases under the contract. (For whole life $T = OL$, for a retirement income endowment T would be taken as the adjusted premium for a term policy expiring at the end of the a period, for a limited pay policy $T = OL$, for a term policy $T = P$.)

Obviously, this is the same equation as in the earlier proposal, with the OL term replaced by T .

There are some disadvantages to this approach. On some policies, in particular life cycle-type policies, it may be difficult to determine the date insurance ceases under the policy. Other policies may be open to manipulation as to the date insurance ceases in order to raise expense allowances. This method also adds additional calculations in the determination of cash values, since the values of T will vary among plans while values of OL do not.

4. The \$40 limit on any adjusted premium in the current law implies a third constant on "excess accumulation" amounts (currently taken as zero). While arbitrary, it reflects industry practice and suggests a three-factor approach.

The rationale would be that less utility would attach to payments in excess of those needed to cover the risk element and to prefund the contract. Under this approach, the premium would be thought of as consisting of three elements: (1) a risk element, (2) a prefunding element, and (3) an accumulation element. Term policies would have only the first element, permanent policies (for the whole of life, regardless of premium period) would have the first two elements, endowments would have all three, and annuities would have only the last.

A better "fit" might be achieved with a three-factor formula, but it would complicate an already complex formula and make treatment of multitrack policies even more difficult. The substitution of net for adjusted premiums would only partly offset these additional complications.

APPENDIX C

EQUIVALENT LEVEL AMOUNT

(Basis: \$1,000 Initial Amount—Age Nearest Birthday—
Curtate Functions—1958 CSO—3½ Per Cent)

COMPARISON OF CURRENT DEFINITION WITH PROPOSED DEFINITION
BASED ON A 10-YEAR LIMIT

BENEFIT SCHEDULE	ISSUE AGE	EQUIVALENT LEVEL AMOUNT	
		Current Definition	Proposed Definition
I. 10-year uniform annually decreasing term	{20	567	567
	{35	518	518
	{50	515	515
II. 20-year uniform annually decreasing term	{20	540	784
	{35	452	759
	{50	469	758
III. \$1,000 1st 5 years—\$500 thereafter for life	{20	521	763
	{35	521	725
	{50	547	724
IV. \$1,000 1st 2 years—\$500 thereafter for life	{20	509	609
	{35	508	587
	{50	518	583
V. \$1,000 1st 5 years—\$2,000 thereafter for life	{20	1,959	1,473
	{35	1,959	1,550
	{50	1,905	1,553
VI. \$1,000 1st 2 years—\$2,000 thereafter for life	{20	1,983	1,783
	{35	1,984	1,827
	{50	1,965	1,833
VII. \$1,000 1st 10 years—\$5,000 thereafter for life	{20	4,685	1,000
	{35	4,633	1,000
	{50	4,152	1,000
VIII. \$1,000 1st 5 years—\$5,000 thereafter for life	{20	4,834	2,892
	{35	4,835	3,199
	{50	4,621	3,211
IX. \$1,000 1st 2 years—\$5,000 thereafter for life	{20	4,932	4,132
	{35	4,937	4,308
	{50	4,859	4,333

APPENDIX D
 COMPARISON OF ADJUSTED PREMIUMS AND
 MINIMUM CASH VALUES
 (Basis: \$1,000—Age Nearest Birthday—Curtate Functions—
 1958 CSO—3½ Per Cent)
 CURRENT EXPENSE ALLOWANCE AND TEST EXPENSE ALLOWANCE
 WHOLE LIFE

ISSUE AGE	POLICY YEAR	CURRENT ALLOWANCE (FORMULA [a] BELOW)		TEST ALLOWANCE (FORMULA [b] BELOW)	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	9.62	— 19.04	9.29	— 11.35
	2		— 11.60		— 3.97
	3		— 3.92		3.66
	4		4.02		11.54
	5		12.23		19.69
	10		57.64		64.75
	15		110.84		117.55
35.....	20	16.54	172.10	16.26	178.35
	@65		552.93		556.30
	1		— 17.26		— 11.62
	2		— 3.40		2.16
	3		10.83		16.31
	4		25.39		30.79
	5		40.27		45.59
50.....	10	32.11	119.21	32.03	124.10
	15		205.05		209.46
	20		295.80		299.70
	@65		481.74		484.61
	1		— 17.53		— 16.21
	2		6.04		7.33
	3		29.82		31.08
65.....	4	67.81	53.80	69.17	55.03
	5		77.95		79.15
	10		200.16		201.20
	15		321.41		322.29
	20		435.98		436.71
	1		— 9.48		— 22.99
	2		26.56		13.53
	3		61.99		49.44
	4		96.69		84.60
	5		130.61		118.97
	10		290.06		280.56
	15		435.60		428.04
	20		556.52		550.58

$$0.40 \left[\frac{P^a}{0.04} \right] + 0.25 \left[\frac{P^a}{OL^a} \right] + 0.02 \quad (a)$$

$$0.50 \left[\frac{P}{0.05} \right] + 0.50 \left[\frac{P}{OL} \right] + 0.01 \quad (b)$$

APPENDIX D—Continued

20-YEAR ENDOWMENT

ISSUE AGE	POLICY YEAR	CURRENT ALLOWANCE (FORMULA [a] BELOW)		TEST ALLOWANCE (FORMULA [b] BELOW)	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	37.90	— 1.45	37.51	4.02
	2		35.97		41.23
	3		74.73		79.78
	4		114.90		119.73
	5		156.54		161.14
	10		388.69		392.03
	15		666.57		668.39
	20		1,000.00		1,000.00
35.....	@65	39.29	— 3.10	39.00	0.85
	1		34.91		38.71
	2		74.21		77.85
	3		114.81		118.29
	4		156.76		160.07
	5		388.52		390.93
	10		664.33		665.65
	15		1,000.00		1,000.00
50.....	@65	46.22	— 6.10	46.39	— 8.18
	1		32.72		30.72
	2		72.47		70.55
	3		113.19		111.36
	4		154.94		153.19
	5		381.57		380.29
	10		650.24		649.52
	15		1,000.00		1,000.00
65.....	1	72.17	— 4.82	73.58	— 18.27
	2		36.22		23.32
	3		77.07		64.72
	4		117.68		105.87
	5		158.09		146.82
	10		363.75		355.23
	15		605.84		600.56
	20		1,000.00		1,000.00

$$0.40 \left[\frac{P^a}{0.04} \right] + 0.25 \left[\frac{P^a}{OL^a} \right] + 0.02 \quad (a)$$

$$0.50 \left[\frac{P}{0.05} \right] + 0.50 \left[\frac{P}{OL} \right] + 0.01 \quad (b)$$

APPENDIX E
 COMPARISON OF ADJUSTED PREMIUMS AND
 MINIMUM CASH VALUES
 (Basis: \$1,000—Age Nearest Birthday—Curtate Functions—
 1958 CSO/Test Allowance)
 3½ VERSUS 4½ PER CENT
 WHOLE LIFE

ISSUE AGE	POLICY YEAR	3½%		4½%	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	9.29	— 11.35	7.65	— 11.38
	2		— 3.97		— 5.74
	3		3.66		0.14
	4		11.54		6.26
	5		19.69		12.65
	10		64.75		48.96
	15		117.55		93.35
	20		178.35		146.55
35.....	@65	16.26	556.30	14.15	511.31
	1		— 11.62		— 11.65
	2		2.16		— 0.03
	3		16.31		11.99
	4		30.79		24.39
	5		45.59		37.14
	10		124.10		106.20
	15		209.46		183.76
50.....	@65	32.03	299.70	29.63	268.26
	1		484.61		448.66
	2		— 16.21		— 16.19
	3		7.33		4.98
	4		31.08		26.47
	5		55.03		48.25
	10		79.15		70.32
	15		201.20		183.90
65.....	@65	69.17	322.29	66.94	299.53
	1		436.71		411.34
	2		22.99		— 25.30
	3		13.53		9.08
	4		49.44		43.04
	5		84.60		76.43
	10		118.97		109.19
	15		280.56		265.00
	20	428.04	410.06		
		20	550.58	532.48	

APPENDIX E—Continued

20-PAYMENT LIFE

ISSUE AGE	POLICY YEAR	3½%		4½%	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	15.36	— 7.85	11.59	— 9.03
	2		5.96		0.85
	3		20.24		11.16
	4		35.03		21.93
	5		50.34		33.19
	10		135.41		97.49
	15		236.35		177.22
35.....	20	23.63	355.47	19.39	275.31
	@65		651.94		585.04
	1		— 7.40		— 8.57
	2		14.20		8.69
	3		36.45		26.62
	4		59.35		45.21
	5		82.91		64.48
50.....	10	39.00	210.84	35.06	171.36
	15		357.63		298.22
	20		527.07		449.26
	@65		651.94		585.04
	1		— 12.17		— 12.98
	2		18.83		14.09
	3		50.40		41.82
65.....	4	72.13	82.54	69.39	70.22
	5		115.27		99.30
	10		288.39		255.70
	15		481.51		434.52
	20		710.71		651.27
	1		— 19.82		— 22.66
	2		20.10		14.59
3	59.70	51.68			
4	98.89	88.53			
5	137.68	125.11			
10	330.71	308.94			
15	543.92	515.10			
20	852.43	816.98			

APPENDIX E—Continued

20-YEAR ENDOWMENT

ISSUE AGE	POLICY YEAR	3½%		4½%	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	37.51	4.02	33.87	3.05
	2		41.23		36.82
	3		79.78		72.15
	4		119.73		109.11
	5		161.14		147.79
	10		392.03		369.91
	15		668.39		648.84
	20		1,000.00		1,000.00
35.....	@65	39.00	0.85	35.40	0.11
	1		38.71		34.56
	2		77.85		70.50
	3		118.29		107.98
	4		160.07		147.06
	5		390.93		369.21
	10		665.65		646.28
	15		1,000.00		1,000.00
50.....	@65	46.39	— 8.18	42.99	— 8.64
	1		30.72		27.03
	2		70.55		63.84
	3		111.36		101.86
	4		153.19		141.14
	5		380.29		359.84
	10		649.52		630.61
	15		1,000.00		1,000.00
65.....	1	73.58	— 18.27	70.96	— 20.96
	2		23.32		18.14
	3		64.72		57.24
	4		105.87		96.30
	5		146.82		135.35
	10		355.23		337.21
	15		600.56		582.66
	20		1,000.00		1,000.00

APPENDIX F
 COMPARISON OF ADJUSTED PREMIUMS AND
 MINIMUM CASH VALUES
 (Basis: \$1,000—Age Nearest Birthday—Curtate Functions—
 4½ Per Cent—Test Expense Allowance)
 1958 CSO VERSUS MODERN CSO
 WHOLE LIFE

ISSUE AGE	POLICY YEAR	1958 CSO		MODERN CSO	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	7.65	— 11.38	7.26	— 11.37
	2		— 5.74		— 6.12
	3		0.14		— 0.69
	4		6.26		4.94
	5		12.65		10.80
	10		48.96		44.08
	15		93.35		85.27
	20		146.55		135.12
	@65		511.31		496.94
	35.....		1		14.15
2		— 0.03	— 0.83		
3		11.99	10.32		
4		24.39	21.85		
5		37.14	33.74		
10		106.20	98.75		
15		183.76	172.95		
20		268.26	255.47		
@65		448.66	437.98		
50.....		1	29.63	— 16.19	
	2	4.98		5.25	
	3	26.47		25.92	
	4	48.25		46.96	
	5	70.32		68.34	
	10	183.90		180.27	
	15	299.53		296.72	
	20	411.34		408.77	
	@65	448.66		437.98	
	65.....	1		66.94	— 25.30
2		9.08	8.43		
3		43.04	42.12		
4		76.43	75.58		
5		109.19	108.89		
10		265.00	271.46		
15		410.06	419.23		
20		532.48	545.74		

APPENDIX F—Continued

20-PAYMENT LIFE

ISSUE AGE	POLICY YEAR	1958 CSO		MODERN CSO	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	11.59	— 9.03	11.09	— 9.09
	2		0.85		0.27
	3		11.16		10.01
	4		21.93		20.15
	5		33.19		30.74
	10		97.49		91.19
	15		177.22		166.63
	20		275.31		259.91
	@65		585.04		569.53
	35.....		1		19.39
2		8.69	7.68		
3		26.62	24.59		
4		45.21	42.16		
5		64.48	60.39		
10		171.36	162.16		
15		298.22	283.91		
20		449.26	429.74		
@65		585.04	569.53		
50.....		1	35.06	— 12.98	
	2	14.09		14.34	
	3	41.82		41.23	
	4	70.22		68.84	
	5	99.30		97.18	
	10	255.70		251.06	
	15	434.52		427.99	
	20	651.27		638.11	
	@65	585.04		569.53	
	65.....	1		69.39	— 22.66
2		14.59	14.10		
3		51.68	50.99		
4		88.53	87.96		
5		125.11	125.12		
10		308.94	315.22		
15		515.10	521.56		
20		816.98	815.52		

APPENDIX F—Continued

20-YEAR ENDOWMENT

ISSUE AGE	POLICY YEAR	1958 CSO		MODERN CSO			
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value		
20.....	1	33.87	3.05	33.86	3.27		
	2		36.82		37.05		
	3		72.15		72.36		
	4		109.11		109.29		
	5		147.79		147.91		
	10		369.91		369.78		
	15		648.84		648.77		
35.....	20	35.40	1,000.00	35.06	1,000.00		
	@65						
	1		0.11		0.53		
	2		34.56		34.81		
	3		70.50		70.61		
	4		107.98		107.98		
	5		147.06		146.97		
50.....	10	42.99	369.21	41.33	369.20		
	15		646.28		646.78		
	20		1,000.00		1,000.00		
	@65						
	1		—		8.64	—	7.13
	2				27.03		28.36
	3				63.84		65.07
65.....	4	70.96	101.86	67.24	103.05		
	5		141.14		142.37		
	10		359.84		362.54		
	15		630.61		634.99		
	20		1,000.00		1,000.00		
	1		—		20.96	—	21.00
	2				18.14		17.97
3		57.24		57.05			
4		96.30		96.42			
5		135.35		136.22			
10		337.21		345.15			
15		582.66		591.54			
20		1,000.00		1,000.00			

APPENDIX G

SUMMARY OF COMPARISON OF ADJUSTED PREMIUMS
AND MINIMUM CASH VALUES

(Basis: \$1,000—Age Nearest Birthday—Curtate Functions—Modern CSO)

CURRENT MINIMA VERSUS TEST MINIMA

WHOLE LIFE

ISSUE AGE	POLICY YEAR	1958 CSO/3½% CURRENT ALLOWANCE		MODERN CSO/4½% TEST ALLOWANCE FORMULA		MODERN CSO/4½% FROZEN ALLOWANCE*	
		Adjusted Premium (1a)	Minimum Cash Value (1b)	Adjusted Premium (2a)	Minimum Cash Value (2b)	Adjusted Premium (3a)	Minimum Cash Value (3b)
20.....	1	9.62	- 19.04	7.26	- 11.37	7.36	- 13.42
	2		11.60		- 6.12		- 8.17
	3		3.92		- 0.69		- 2.72
	4		4.02		4.94		2.92
	5		12.23		10.80		8.80
	10		57.64		44.08		42.14
	15		110.84		85.27		83.41
35.....	20	172.10	135.12	133.36			
	@65	552.93	496.94	495.92			
	1	16.54	- 17.26	13.16	- 11.59	13.33	- 14.64
	2		- 3.40		- 0.83		- 3.85
	3		10.83		10.32		7.34
	4		25.39		21.85		18.90
	5		40.27		33.74		30.83
10	119.21		98.75		96.03		
15	205.05		172.95		170.45		
50.....	20	295.80	255.47	253.22			
	@65	481.74	437.98	436.28			
	1	32.11	- 17.53	27.29	- 15.03	27.60	- 19.55
	2		6.04		5.25		0.82
	3		29.82		25.92		21.58
	4		53.80		46.96		42.71
	5		77.95		68.34		64.20
10	200.16		180.27		176.62		
15	321.41		296.72		293.59		
65.....	20	435.98	408.77	406.14			
	1	67.81	- 9.48	62.97	- 25.59	62.97	- 25.59
	2		26.56		8.43		8.43
	3		61.99		42.12		42.12
	4		96.69		75.58		75.58
	5		130.61		108.89		108.89
	10		290.06		271.46		271.46
15	435.60		419.23		419.23		
	20	556.52	545.74	545.74			

* Frozen allowance is defined as

$$\left[P_x^{3\frac{1}{2}\%/1958 \text{ CSO}} \right] + 0.01 .$$

APPENDIX H
COMPARISON OF 1,000 q_x ON 1958 CSO TABLE
AND MODERN CSO

Age	1958 CSO	Modern CSO	Age	1958 CSO	Modern CSO	Age	1958 CSO	Modern CSO
0.....	7.08	4.98	34.....	2.40	2.29	68....	41.68	37.04
1.....	1.76	1.50	35.....	2.51	2.37	69....	45.61	40.29
2.....	1.52	1.44	36.....	2.64	2.47	70....	49.79	43.77
3.....	1.46	1.36	37.....	2.80	2.59	71....	54.15	47.58
4.....	1.40	1.30	38.....	3.01	2.75	72....	58.65	51.80
5.....	1.35	1.24	39.....	3.25	2.94	73....	63.26	56.51
6.....	1.30	1.19	40.....	3.53	3.15	74....	68.12	61.71
7.....	1.26	1.15	41.....	3.84	3.39	75....	73.37	67.41
8.....	1.23	1.12	42.....	4.17	3.65	76....	79.18	73.61
9.....	1.21	1.11	43.....	4.53	3.94	77....	85.70	80.31
10.....	1.21	1.11	44.....	4.92	4.26	78....	93.06	87.52
11.....	1.23	1.12	45.....	5.35	4.60	79....	101.19	95.31
12.....	1.26	1.15	46.....	5.83	4.98	80....	109.98	103.76
13.....	1.32	1.20	47.....	6.36	5.41	81....	119.35	112.95
14.....	1.39	1.27	48.....	6.95	5.87	82....	129.17	122.97
15.....	1.46	1.35	49.....	7.60	6.39	83....	139.38	133.85
16.....	1.54	1.43	50.....	8.32	6.96	84....	150.01	145.51
17.....	1.62	1.51	51.....	9.11	7.60	85....	161.14	157.79
18.....	1.69	1.60	52.....	9.96	8.30	86....	172.82	170.57
19.....	1.74	1.68	53.....	10.89	9.07	87....	185.13	183.78
20.....	1.79	1.75	54.....	11.90	9.92	88....	198.25	197.47
21.....	1.83	1.82	55.....	13.00	10.84	89....	212.46	211.81
22.....	1.86	1.88	56.....	14.21	11.84	90....	228.14	227.09
23.....	1.89	1.93	57.....	15.54	12.91	91....	245.77	243.72
24.....	1.91	1.97	58.....	17.00	14.06	92....	265.93	262.23
25.....	1.93	2.00	59.....	18.59	15.34	93....	289.30	283.27
26.....	1.96	2.03	60.....	20.34	16.79	94....	316.66	307.61
27.....	1.99	2.06	61.....	22.24	18.47	95....	351.24	338.78
28.....	2.03	2.08	62.....	24.31	20.43	96....	400.56	384.83
29.....	2.08	2.10	63.....	26.57	22.69	97....	488.42	469.93
30.....	2.13	2.12	64.....	29.04	25.23	98....	668.15	648.88
31.....	2.19	2.15	65.....	31.75	27.98	99....	1,000.00	1,000.00
32.....	2.25	2.19	66.....	34.74	30.90	100....
33.....	2.32	2.23	67.....	38.04	33.93			

APPENDIX I
COMPARISON OF MARGINS AT SELECTED AGES
ON 1958 CSO AND MODERN CSO

AGE	MARGIN PER 1,000		RATIO OF MARGIN TO UNDERLYING RATE	
	1958 CSO	Modern CSO	1958 CSO	Modern CSO
0.....	0.75	0.75	11.8%	17.7%
1.....	0.76	0.76	76.0	102.7
5.....	0.80	0.80	145.5	181.8
10.....	0.85	0.85	236.1	326.9
15.....	0.90	0.90	160.7	200.0
20.....	0.95	0.95	113.1	118.8
25.....	1.00	1.00	107.5	100.0
30.....	1.05	1.05	97.2	98.1
35.....	1.10	1.09	78.0	85.2
40.....	1.17	1.15	49.6	57.5
45.....	1.32	1.27	32.8	38.1
50.....	1.61	1.50	24.0	27.5
55.....	2.07	1.87	18.9	20.8
60.....	2.78	2.46	15.8	17.2
65.....	4.14	3.67	15.0	15.1
70.....	6.49	5.71	15.0	15.0
75.....	9.57	8.79	15.0	15.0
80.....	14.34	13.53	15.0	15.0
85.....	21.02	20.58	15.0	15.0
90.....	29.76	29.62	15.0	15.0
95.....	48.21	46.48	15.9	15.9

APPENDIX J
 COMPARISON OF ADJUSTED PREMIUMS AND
 MINIMUM CASH VALUES
 (Basis: \$1,000—Age Nearest Birthday—Curtate Functions—
 $4\frac{1}{2}$ Per Cent—Test Expense Allowance)
 MODERN CSO VERSUS MODERN BASIC
 WHOLE LIFE

ISSUE AGE	POLICY YEAR	MODERN CSO		MODERN BASIC	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	7.26	— 11.37	6.14	— 10.48
	2		— 6.12		— 5.40
	3		— 0.69		— 0.14
	4		4.94		5.33
	5		10.80		11.02
	10		44.08		43.35
	15		85.27		83.38
35.....	20	13.16	135.12	11.72	131.71
	@65		496.94		482.12
	1		— 11.59		— 10.59
	2		— 0.83		— 0.18
	3		10.32		10.59
	4		21.85		21.73
	5		33.74		33.20
50.....	10	27.29	98.75	24.89	95.88
	15		172.95		167.41
	20		255.47		247.01
	@65		437.98		423.40
	1		— 15.03		— 13.73
	2		5.25		5.66
	3		25.92		25.43
65.....	4	62.97	46.96	57.67	45.55
	5		68.34		66.01
	10		180.27		173.15
	15		296.72		284.83
	20		408.77		393.26
	1		— 25.59		— 27.41
	2		8.43		4.89
	3		42.12		36.97
	4		75.58		68.91
	5		108.89		100.78
	10		271.46		257.36
	15		419.23		401.44
	20		545.74		526.03

APPENDIX J—Continued

20-PAYMENT LIFE

ISSUE AGE	POLICY YEAR	MODERN CSO		MODERN BASIC	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	11.09	— 9.09	9.50	— 8.46
	2		0.27		0.23
	3		10.01		9.27
	4		20.15		18.68
	5		30.74		28.50
	10		91.19		84.54
	15		166.63		154.28
	20		259.91		240.06
35.....	@65	18.27	569.53	16.53	546.72
	1		— 8.58		— 7.76
	2		7.68		7.80
	3		24.59		23.98
	4		42.16		40.77
	5		60.39		58.18
	10		162.16		155.10
	15		283.91		270.58
50.....	@65	32.73	429.74	30.38	408.10
	1		569.53		546.72
	2		— 11.83		— 10.51
	3		14.34		14.81
	4		41.23		40.82
	5		68.84		67.52
	10		97.18		94.94
	15		251.06		243.71
65.....	@65	65.51	427.99	60.67	414.33
	1		638.11		615.38
	2		— 22.86		— 24.20
	3		14.10		11.56
	4		50.99		47.37
	5		87.96		83.38
	10		125.12		119.70
	15		315.22		307.09
	20	521.56	512.52		
		815.52	795.97		

APPENDIX J—Continued

20-YEAR ENDOWMENT

ISSUE AGE	POLICY YEAR	MODERN CSO		MODERN BASIC	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	33.86	3.27	33.19	4.37
	2		37.05		38.42
	3		72.36		73.98
	4		109.29		111.15
	5		147.91		150.00
	10		369.78		372.56
	15		648.77		651.13
	20		1,000.00		1,000.00
35.....	@65	35.06	0.53	34.25	1.85
	1		34.81		36.40
	2		70.61		72.46
	3		107.98		110.06
	4		146.97		149.27
	5		369.20		372.18
	10		646.78		649.40
	15		1,000.00		1,000.00
50.....	@65	41.33	7.13	39.90	5.32
	1		28.36		30.28
	2		65.07		67.12
	3		103.05		105.23
	4		142.37		144.70
	5		362.54		365.67
	10		634.99		638.42
	15		1,000.00		1,000.00
65.....	1	67.24	21.00	62.94	21.77
	2		17.97		16.59
	3		57.05		55.24
	4		96.42		94.32
	5		136.22		134.00
	10		345.15		344.68
	15		591.54		596.48
	20		1,000.00		1,000.00

APPENDIX K
 COMPARISON OF 1,000 q_x ON MODERN CSO
 MALE AND FEMALE VERSUS COMBINED

Age	Combined	Male	Female
5.....	1.24	1.31	1.12
10.....	1.11	1.15	1.07
15.....	1.35	1.42	1.08
20.....	1.75	1.87	1.29
25.....	2.00	2.08	1.61
30.....	2.12	2.17	1.78
35.....	2.37	2.39	2.09
40.....	3.15	3.15	2.81
45.....	4.60	4.61	3.66
50.....	6.96	6.98	4.77
55.....	10.84	10.93	6.28
60.....	16.79	16.94	8.52
65.....	27.98	29.12	13.70
70.....	43.77	45.84	23.71
75.....	67.41	69.96	43.80
80.....	103.76	106.96	73.76
85.....	157.79	160.16	118.40
90.....	227.09	241.86	187.70

NOTE.—The above male and female figures were constructed using very approximate methods, on the basis of the same general data underlying the combined table. Only a portion of such underlying data was available on a sex-distinct basis, and this caused certain minor inconsistencies in relation to the combined figures. However, the effect of such inconsistencies on the cash values shown in Appendix L is negligible.

APPENDIX L
 COMPARISON OF ADJUSTED PREMIUMS AND
 MINIMUM CASH VALUES
 (Basis: \$1,000—Age Nearest Birthday—Curtate Functions—
 Modern CSO—4½ Per Cent—Test Allowance)
 SEPARATE MALE AND FEMALE VERSUS COMBINED TABLE
 WHOLE LIFE

ISSUE AGE	POLICY YEAR	COMBINED		MALE		FEMALE	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20	1	7.26	— 11.37	7.35	— 11.48	5.97	— 10.99
	2		— 6.12		— 6.26		— 6.62
	3		— 0.69		— 0.85		— 2.11
	4		4.94		4.77		2.54
	5		10.80		10.63		7.34
	10		44.08		44.07		34.27
	15		85.27		85.57		67.15
35	20		135.12		136.01		106.18
	1	13.16	— 11.59	13.29	— 11.59	10.52	— 11.50
	2		— 0.83		— 0.71		— 3.22
	3		10.32		10.58		5.31
	4		21.85		22.25		14.10
	5		33.74		34.31		23.15
	10		98.75		100.21		72.76
50	15		172.95		175.50		131.06
	20		255.47		259.37		199.38
	1	27.29	— 15.03	27.70	— 15.02	20.37	— 13.44
	2		5.25		5.67		2.20
	3		25.92		26.75		18.36
	4		46.96		48.21		35.03
	5		68.34		70.03		52.26
65	10		180.27		184.42		147.32
	15		296.72		303.20		256.34
	20		408.77		414.94		373.32
	1	62.97	— 25.59	64.58	— 25.06	46.69	— 19.76
	2		8.43		9.28		13.07
	3		42.12		43.13		46.23
	4		75.58		76.66		79.66
	5		108.89		109.98		113.27
	10		271.46		272.64		278.15
	15		419.23		420.58		425.89
	20		545.74		550.29		558.15

NOTE.—Cash values for females are significantly lower than those for combined, except at issue age 65; this high age anomaly is believed to be caused by two factors: (i) the female table ends arbitrarily at age 100, and (ii) the \$40 adjusted premium and \$50 net premium limits in the formula affect combined and male values but not those for females.

APPENDIX M

COMPARISON OF ADJUSTED PREMIUMS AND
MINIMUM CASH VALUES

(Basis: \$1,000—Age Nearest Birthday—Curtate Functions—
Modern CSO—4½ Per Cent—Test Allowance)

COMPARISON OF 3-YEAR AND 6-YEAR SETBACKS ON COMBINED TABLE
WHOLE LIFE

ISSUE AGE	POLICY YEAR	NO SETBACK		3-YEAR SETBACK		6-YEAR SETBACK	
		Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value	Adjusted Premium	Minimum Cash Value
20.....	1	7.26	— 11.37	6.53	— 11.17	5.87	— 10.97
	2		— 6.12		— 6.47		— 6.69
	3		— 0.69		— 1.62		— 2.29
	4		4.94		3.39		2.23
	5		10.80		8.55		6.88
	10		44.08		37.53		32.46
	15		85.27		73.26		63.48
35.....	20		135.12		117.24		101.88
	1	13.16	— 11.59	11.54	— 11.52	10.19	— 11.53
	2		— 0.83		— 2.22		— 3.53
	3		10.32		7.47		4.82
	4		21.85		17.54		13.53
	5		33.74		27.99		22.60
	10		98.75		85.75		73.54
50.....	15		172.95		152.48		133.36
	20		255.47		227.93		201.92
	1	27.29	— 15.03	23.39	— 13.82	20.13	— 12.94
	2		5.25		4.15		2.92
	3		25.92		22.52		19.20
	4		46.96		41.30		35.88
	5		68.34		60.46		52.97
65.....	10		180.27		161.41		143.99
	15		296.72		269.83		243.05
	20		408.77		378.64		347.59
	1	62.97	— 25.59	53.21	— 25.90	44.63	— 21.73
	2		8.43		5.99		7.26
	3		42.12		37.58		36.43
	4		75.58		68.83		65.61
	5		108.89		99.71		94.65
	10		271.46		250.94		235.55
	15		419.23		394.19		371.37
	20		545.74		521.36		496.53

NOTE.—The use of a 3-year or 6-year setback in effect extends the mortality table to age 103 and 106, respectively. Thus the cash values are not subject to the anomaly described in item (i) of the footnote to Appendix L.

APPENDIX N

TEST OF DEPOSIT TERM

It is recommended that plans with identical benefits and identical premium-paying periods have identical expense allowances. Applying this proposal in conjunction with the test allowance to an actual deposit term contract, we have the following comparison of minimum cash values.

DEPOSIT TERM
8-YEAR RENEWABLE AND CONVERTIBLE TERM
1958 CSO— $3\frac{1}{2}$ PER CENT CURTATE
AGE 35
(\$1,015 of Term Insurance/\$15 Pure Endowment;
Annual Premium \$4.49 plus \$7.50 Deposit)

DURATION	MINIMUM CASH VALUES		DURATION	MINIMUM CASH VALUES	
	Current Method	Test Formula		Current Method	Test Formula
0.....	—\$32.53	—\$14.84	5.....	\$ 2.53	\$ 8.39
1.....	— 15.47	— 2.74	6.....	6.84	10.82
2.....	— 10.94	0.17	7.....	11.00	13.03
3.....	— 6.40	3.03	8.....	15.00	15.00
4.....	— 1.90	5.78			

Do the resulting values provide a reasonable result? The sales literature indicates "deposit to double" at a return over eight years of 9.05 per cent compounded annually; thus a reasonable result might be something approaching the minimum cash value for the term portion of the contract plus the accumulation of the deposit at the guaranteed rate of 9.05 per cent.

The following shows the results of this test.

Duration	Minimum Cash Value \$1,015 Term	\$7.50(1.0905) ⁿ	Total
0.....	—\$13.26	\$ 7.50	—\$ 5.76
1.....	— 11.13	8.18	— 2.95
2.....	— 9.06	8.92	— 0.14
3.....	— 7.07	9.73	2.66
4.....	— 5.22	10.61	5.39
5.....	— 3.55	11.57	8.02
6.....	— 2.10	12.61	10.51
7.....	— 0.90	13.75	12.85
8.....	0	15.00	15.00

Expense allowance:

Current:

$$0.02(ELA) + 0.40 \left[\frac{11.99(r)}{0.04(ELA)} \right] + 0.25 \left[\frac{OL^a(ELA)}{0.04(ELA)} \right] = \$32.53 .$$

Test formula:

$$0.01(ELA) + 0.50 \left[\frac{L_P}{0.05(ELA)} \right] + 0.50 \left[\frac{OL(ELA)}{0.05(ELA)} \right] = \$14.84 .$$

ELA = \$1,015 equivalent level amount of insurance;

OL^a = Ordinary life adjusted premium per dollar of insurance under current law;

OL = Ordinary life net premium per dollar of insurance;

L_P = Uniform level net premium, i.e., $L_P(\ddot{a}_{35:\overline{8}}) = 1,015(A_{35:\overline{8}}^1) + 15(A_{35:\overline{8}}^{\frac{1}{8}})$;

r = Uniform percentage of varying gross premium for expressing adjusted premium.

