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BOOK REVIEWS AND NOTICES

P. F. Hooker and L. H. Longley-Cook, *Life and Other Contingencies* (Volume I), pp. viii, 312, published for the Institute of Actuaries and the Faculty of Actuaries at the Cambridge University Press, 1953.

This volume is one of the series of textbooks published under the authority of the Institute of Actuaries and the Faculty of Actuaries; its main purpose is to enable students of these organizations to prepare themselves for examination in the subject of Life and Other Contingencies. The authors point out in their preface that the scope of the book has been determined by the requirements of the syllabus of the Institute examinations. These requirements have also determined the division of the book into two volumes, of which only the first is here under review. Volume I deals with single decrement tables and with functions involving only a single life.

Like other textbooks of the series, this volume is carefully and attractively printed. It has very few typographical errors, none of which are likely to mislead the careful student. It includes a good index and a few illuminating diagrams and graphs. The authors' grasp of the subject matter is excellent.

Today's writers on actuarial mathematics have the privilege of standing on the shoulders of giants of the stature of King and Spurgeon. This privilege involves the obligation, however, of seeing further than yesterday's giants, especially in directions where their vision did not fully pierce. Perhaps the major criticism of the texts of King and Spurgeon, from the viewpoint of student development, is their implicit assumption that a careful statement of principles, plus a handful of examples, will be sufficient to develop the power that a student needs for examination purposes and for his later work. In the United States, teachers of mathematics think of power as the ability to apply principles with ease, facility and confidence in original situations requiring clear thinking and precise mathematics. Power is not acquired merely from an understanding of even the most excellent text. It results from exercise, not osmosis. This implies that a wealth of graded exercises must be presented to the student; that the exercises must range in difficulty from modifications of the text to original investigations; and that a set of answers should be available to him. Unfortunately, the present volume, despite its many merits, omits the only means by which real power may be developed.

It may be that this omission stems from the possibility that a well organized set of exercises is available to students from some other source, such as a tuition service. On the other hand, it may stem from the absence of a consistent idea of the degree of maturity to be expected among the students. On this score, one finds a curious unevenness in the exposition throughout the book. Thus, the authors seem to feel that the average student will have a rather limited mathematical technique, for they write out explicitly every mathematical detail in

most of their derivations and carefully indicate all the steps in the differentiations of the actuarial functions. In contrast to this general spoon-feeding on rather trivial mathematical points, their discussion is sometimes so abstract that only a remarkably mature student will really gain complete understanding. An illustration of this is the explanation on page 150 of the effect of a constant change in the force of mortality. The authors follow Spurgeon in covering this point by considering the equation

$$\frac{d}{dt} D_{|x|+t} = -D_{|x|+t} (\mu_{|x|+t} + \delta) .$$

The authors then state that the effect on $D_{|x|+t}$ of a constant extra force of mortality is the same as if the mortality were unchanged and the constant extra were added to the force of interest. From this, they state without further ado that the theorem holds for life annuity and temporary annuity values. Most students will find it difficult to leap the gap and would probably prefer to use the illuminating equation:

$${}_nE_x = e^{-\int_0^n (\mu_{x+t} + \delta) dt} .$$

Another illustration of the unevenness of exposition appears in Section 13.4. The authors first refer to alterations in the values of A and B in Makeham's law. They then state that the effect of a change in c "can be represented by a change in the time scale." This abstract language is followed by some mathematical steps indicating that, for annuity values, the amount of annuity must be changed, the age must be multiplied by a constant, and the interest rate must be changed. More than one mature student will wonder how these three changes can be denoted as a change in the time scale, and what legerdemain has produced the expression for the new interest rate. The fact that reference is made to the original paper in which the expression was derived does not seem to this reviewer to justify the bewilderment of the student.

In Section 8.3, the authors assume without prior motivation that students will readily understand the significance of

$$\int_0^{\infty} \bar{M}_{x+t} dt .$$

The absence of motivation is most startling in Section 4.4, where the student is given a verbal definition of the various kinds of annuities, a formula in terms of pure endowments and a statement that commutation symbols help save arithmetical work. Then, without any attempt to express annuity values in terms of l 's, or any indication of the chain of reasoning by which an actuary might be led to the realization of the need for commutation symbols, the authors hurl the definitions of nine such symbols at the student.

Another instance where the student encounters a mathematical concept without adequate preparation appears on page 166, where he is expected to appreciate instinctively that $l_{x+t}\mu_{x+t}$ is a constant for all values of t between 0 and

1 if deaths are assumed to be distributed uniformly over the year of age x to $x + 1$.

After noting these instances, we find an opposite extreme in the chapters on life office valuation. Here the student is apparently deemed to be so naïve that he must be instructed in such matters as the sorting of valuation cards. Similarly, in the chapter on construction of tables, almost a page is devoted to the number of significant figures to be retained in various stages of a set of calculations; about three pages are devoted to a verbal analysis of the routine for calculating by a continued process.

A few notational points require comment. On page 40, it is stated that ${}_{10|15}a_{[35]}$ may also be written as ${}_{10|15}a_{[35]:\overline{15}}$. The latter form is not in accord with the principles of the International Notation; it implies that the two statuses $[35]$ and $\overline{15}$ run concurrently with the 10 years of deferment, so that at most 5 years of payment would occur. In the first form the 15 year period is to commence at the end of the 10 years of deferment. Similarly, the chart on page 49 shows ${}_n|A_{[x]:\overline{m}}$ as the symbol for an m -year endowment assurance deferred n years; it would appear that the symbol should be ${}_n|A_{[x]:\overline{m+n}}$, and a corresponding change is required for the deferred term insurance symbol in the chart. The annual premium symbols (page 53) for these two policy forms also need to be revised.

While the authors have generally succeeded in maintaining a clear distinction between exact and approximate formulas, there are a few places where the distinction is not made. For example, formula (10.11) purports to give the true value of a varying death benefit by taking account of the average sum assured in each year. The solution on page 116 also introduces approximations without specific mention.

The authors have corrected a stumbling block in the treatment of equality of policy values by different mortality tables in Section 11.7. Spurgeon and other writers have shown that if ${}_tV_x = {}_tV'_x$, then

$$q'_x = q_x + \frac{k}{v\ddot{a}_{x+1}}$$

They have then assumed the converse without proof and without certain necessary restrictions. The present authors carefully avoid this pitfall. Ironically, in the same section, the authors then refer to the case involving continuous functions, indicate how to prove that equal reserves imply a certain relation between the forces of mortality—and then assume the converse holds!

Throughout the volume, stress is placed on the statistical approach to the mortality table and its derived functions. To this reviewer, the approach seems to draw a shroud of mystery around some basic concepts which ought to be kept crystal clear to the student. A typical example appears on page 117, where the authors assume that each of an indefinitely large number of select lives aged x is insured for the whole of life, and that the actual interest and mortality experience is identical with the initially assumed experience, expenses being

disregarded. At the end of t years, they state, the total sum in hand divided by the number of policies then in force gives the policy value in respect of an individual policy "taken at random." The force of the words "taken at random" is obscure. Many students will feel that a value which applies to any policy taken at random must apply to each and every policy, which is surely not the authors' intention.

The stress on the statistical approach leads, in the very first chapter, to the unfortunate statement: "The fundamental function of the mortality table is a function known as l_x ." This statement reminds one of the oversimplified approach of George King, although the authors are writing on a rather sophisticated level. To most students, it would appear simpler to refer consistently to the mortality table as a mathematical model, defined by the force of mortality (or the rate of mortality or the probability of survival), and used merely as an aid in computing. Such an approach avoids the confusing comment made on page 12 that "the force of mortality is a purely theoretical function which exists only in the mortality table and has no precise counterpart in experience; it is unsound, for example, to say that a group of lives is subject to a force of mortality." This makes the force of mortality, in the mind of a student, a cross between a Cheshire cat and the fourth dimension. On page 150, the student then finds that it is apparently not unsound to say that a single life "is subject to a constant extra force of mortality." Students will find it difficult to see why the force of mortality is any more theoretical than the other functions of the life table and, I believe, will continue to use the "unsound" expression because it is so concise and descriptive.

Chapter 17 of the Volume, which deals with benefits depending on marriage and sickness, is a worth-while addition to the scope of the material covered by King and Spurgeon. In general, this chapter is clearly and carefully written. Section 17.5, however, is rather disappointing to this reviewer. In the space of two pages, one finds reference to a relation which is "beyond the scope of the present Volume," "methods which cannot be considered here," and "reasons which cannot be discussed here." While it is on occasion a useful device to refer to an item which is beyond the scope of a particular textbook, the student feels he is sailing in the stratosphere when the device is used too often. Nor will it be clear to the student why the reasons given for considering the function v_x as a measure of the marriage rate instead of the force of marriage does not apply equally well to the function $^h i_x$ which is called the force of issue.

The definition of "sickness" as meaning "sickness as defined in the rules of a particular Society," on page 239, cannot but leave students with the feeling that nothing has been defined. It would have been worth while to at least illustrate the definition by a brief summary of a typical set of rules.

A full chapter has been devoted to the subject of extra risks. This chapter is a concise and valuable summary of the basic mathematical concepts underlying the subject.

The two chapters devoted to life office valuations are well organized and

almost represent a manual for this important practical work, notwithstanding the tendency to belabor some rather obvious points.

There is a radical departure in the treatment of stationary populations in Section 14.5. Only two pages are devoted to the subject, but the mathematical treatment is concise and clear. The authors have given brief treatment to this subject because they believe it has little value or importance for modern practical work. This reviewer regrets that students have been invited to go into the water only up to their ankles; he would have preferred either a bracing swim in a fuller treatment of the subject or else the elimination of the brief treatment.

The solutions to the examples given at the conclusion of each chapter are set forth neatly and effectively, and students will acquire a knowledge of some points not specifically mentioned in the text by working through the examples conscientiously. Incidentally, the formula used in Example 2.2 is not indicated in the text and it would have been helpful to students to indicate that the formula could be obtained by a modification of the method used in deriving formula (2.18).

The authors show unmistakable evidence of their high mathematical talents and of their conscientious efforts to smooth the path of the student, and the present Volume I contains enough of value to make it a worth-while acquisition to any actuarial library.

HARRY GERSHENSON

Examination of Insurance Companies, vol. 1, pp. xviii, 571; vol. 2, pp. xxx, 787; published by the New York State Insurance Department, New York, 1953.

The New York Insurance Department is in the midst of a comprehensive three-year program of in-service training for its examiners. This training is designed to equip each examiner with adequate historical background and the latest technical knowledge so that he may perform an efficient job of examination consistent with the authority outlined in the insurance statutes of New York. In the first phase of this program, a series of lectures was given by experts from each line in the ever-widening field of insurance. The two volumes summarize this series of lectures. They cover the entire gamut from Marine, Fire, Fraternal, Fidelity, Title, Casualty, Accident and Health to Life insurance.

Part I of the first volume contains an informative summary of the history, organization, administrative powers and functions of the New York State Insurance Department and the National Association of Insurance Commissioners. Chapter 6 in this volume presents a concise and complete summary of the basic life insurance principles and describes how various phases of the business are subject to limitations and controls outlined by the New York Insurance Statutes and to examinations by the New York Insurance Department. Chapter 12 emphasizes the role of Accident and Health insurance as an offset to the loss of earned income resulting from disability. Risk selection, determination of premium rates, and claims administration are discussed in some detail; also covered are the types of policies, Blue Cross plans, noncancelable insurance, hospital, surgical and medical coverage and franchise disability insurance. Chapter 13

is concerned with nonprofit hospitalization and medical indemnity insurance; Blue Cross and Blue Shield insurance and similar plans are covered in detail from their origin about 25 years ago. Chapter 14 presents a thorough and concise analysis of the various types of coverages in Group insurance and retirement plans from their early beginnings. Chapter 15, which contains a short but valuable summary of Life Reinsurance, discusses such items as why companies reinsure, the types of reinsurance contracts and the various plans and bases of reinsurance. Volume 2 deals more directly with the techniques and procedures used in the actual examination of insurance company records.

Although the lectures, and hence the books, were prepared with emphasis on the training of insurance examiners, much of the material has a more general utility as a ready reference for information on all lines of insurance business. These books also provide an insight to the official interpretation of the various statutes and to the procedure for regulating and supervising each line of insurance business.

KENNETH D. MITCHEM

The Bureau of National Affairs, *Pensions and Profit Sharing*, pp. xi, 272, Washington, D.C., 1953.

This book was written "for the executive who makes the ultimate decisions but who necessarily cannot be an expert in all the legal and actuarial details." As such, it should be very useful to anyone who wants to learn the fundamental ground rules of pensions, but it will not convert the student into an expert. The book is an outgrowth of the *Handbook for Pension Planning*, published by the Bureau of National Affairs in 1949. As was the case with the earlier volume, it represents a collective effort of seven well-known experts, plus the publisher's editorial staff. The earlier edition contained several appendixes, including a glossary of pension terms and illustrative texts of plans, trust agreements and negotiated provisions, which many may have found helpful. All this material has been omitted from the new edition, perhaps on the theory that it is now readily available in other sources. On some subjects, such as the taxation of benefits to employees, some might well find the earlier edition more helpful.

The first chapter is by George B. Buck, Jr., who covers "The Features of Present-Day Pension Plans." It is somewhat regrettable that this chapter should have been written with one type of funding medium so predominantly in mind. Perhaps this is nowhere so evident as in the discussion of death benefits, where the reader unfamiliar with insured plans might be seriously misled. On other points, too, one cannot help but feel that the author is expressing merely his personal convictions. The discussion of vesting is quite incomplete, for it leaves out entirely the principal arguments in favor of it. It also minimizes the weaknesses of final salary plans and overstresses the significance of waiting periods in insured plans, particularly of the group annuity and deposit administration type. All in all, the chapter represents the pension planning approach of just one school of thought, and there are others, equally expert.

Herman C. Biegel, in his chapter on "Tax and Legal Aspects of Pension Plans," does a highly commendable job in organizing a very complex subject. There is considerable doubt, however, concerning his statement that the Internal Revenue Code requires that a plan, to be qualified, "must be established and maintained on an actuarially sound basis." John B. St. John has a chapter on "Financing a Pension Plan," in which he covers the principal funding media competently and fairly, without getting too far into the competitive aspects. His tabular analysis of the various financing methods on page 120 should be very helpful; unfortunately, it does not include the most flexible form of insured vehicle, the deposit administration contract, and may, therefore, give the impression that the self-administered trust offers more flexibility than can be obtained under any other method.

William W. Fellers' chapter on "Pension Costs and Cost Experience" is clear and informative. His discussion of mortality tables should be very helpful to laymen; it is a pity he did not mention the need for anticipating future improvement in mortality. His table on page 140, illustrating the cost computations in a plan undergoing change, should be very helpful. The chapter on "Deferred Profit-Sharing Plans," by Fleming Bomar, is an indication of the rapidly growing importance of profit sharing, for the previous edition did not include anything on this subject. While it is quite thorough, a more comprehensive treatment could expand on the following important applications of profit-sharing: (1) a trust using Ordinary life policies, (2) a profit-sharing retirement plan, purchasing deferred annuities under a group annuity contract, alone or supplementary to a basic pension plan, (3) a thrift plan.

The chapter by the Bureau Staff on "Bargaining on Pensions" presents a great deal of information in readily digestible form. A. D. Marshall, in "Administration of Pension Plans," covers many important, if less glamorous, aspects thoroughly and very competently. Austin M. Fisher, in "Human Relations in Pension Planning," has much sound counsel to offer in areas which too often receive too little attention. His section on preparation for retirement very possibly could stand further development. The book could have benefited by additional chapters on the investment of pension trust funds and the revision of existing plans.

MEYER MELNIKOFF

SELECT CURRENT BIBLIOGRAPHY

In compiling this list, the Committee on Review has digested only those papers which appear to be of direct interest to members of the Society of Actuaries; in doing so, the Committee offers no opinion on the views which the various articles express. The digested articles will be listed under the following subject matter classifications: 1—Actuarial and other mathematics, statistics, graduation; 2—Life insurance and annuities; 3—Accident and sickness insurance; 4—Social security; 5—Other topics.

References to allied subjects will be found in the following publications: *Mathematical Reviews*, published by the American Mathematical Society—Subjects: Theory of

probability, mathematical statistics, mathematical economics, various other mathematical topics; *Monthly Labor Review*, published by Bureau of Labor Statistics—Subjects: Cost and standards of living, employment and employment services, fringe benefits, handicapped, industrial hygiene, industrial relations, labor organization and activities, manpower, older workers and the aged, personnel management, social security (general); *Population Index*, published by Office of Population Research, Princeton University, and Population Association of America—Subjects: Mortality, fertility, marriage, divorce, the family, various other demographic topics; *Social Security Bulletin*, published by Social Security Administration—Subjects: Retirement and old age, employment, maternal and child welfare, health and medical care, various other topics in social security; *Journal of the Institute of Actuaries*—The review section contains digests in English of articles appearing in foreign actuarial journals.

LIFE INSURANCE AND ANNUITIES

J. W. Fischbach, "Validity of Aviation Risk Exclusion Riders—A State by State Study," *Proceedings of the American Life Convention, Legal Section, 1953*, p. 94.

A comprehensive study is presented of the validity of aviation exclusion provisions if, following the death of the insured by the excluded cause, the beneficiary contends that the exclusion provision is invalid and ineffective. Incontestability and mode-of-settlement statutes of each state, as well as relevant special laws and court decisions, are reviewed and appraised.

G. V. Bailey, "The Valuation of Last Survivor Annuities," *Journal of the Institute of Actuaries*, Vol. 79, Part 3, p. 323, 1953.

The author develops a method for the approximate valuation of joint and survivor annuities where the two lives may be subject to different mortality experiences. The schemes described for the age grouping of the data limit the maximum number of groups to the number of different male ages, the number of different female ages, or the sum of these two. Of the several schemes of grouping presented, it is possible to select one which would be superior for a particular body of valuation data. The valuation factor for any valuation group is the joint and survivor annuity value for the pair of ages determined by the age of one of the classes of lives in that group and the average age of the other class of lives within that group.

ACCIDENT AND SICKNESS INSURANCE

U.S. Department of Health, Education, and Welfare, *Sources of Morbidity Data, Listing Number 1, 1953*, Public Health Service Publication No. 332, not paged, Washington, 1953.

A *Clearinghouse on Current Morbidity Statistics Projects* has been organized within the Public Health Service to provide a systematic source of information where specific data on morbidity are available and also to afford a means of interchange for those planning studies involving the measurement of illness, disease, injuries or impairments. The listings are restricted to projects in progress or completed since January 1, 1950. No project was listed unless it had a population base for the computation of rates. Although an effort was made to include all projects meeting these requirements it is suspected that the listing is incomplete because the *Clearinghouse* is not yet widely known. For each project listed there is a brief account of the types of data collected and the purpose of the project, the population under observation, the method of obtaining the data, the stage of progress on the work, and the name and address of the person to whom re-

quests for further information may be addressed. The present report describes 62 general morbidity projects and also projects dealing with such specific conditions as heart disease and other cardiovascular-renal diseases, diabetes, cancer, poliomyelitis, tuberculosis, venereal diseases, rheumatic fever, mental disease and urological disorders.

Odin W. Anderson, Ph.D., *National Consumer Survey of Medical Costs and Voluntary Health Insurance*, Health Information Foundation, New York, 1954.

This publication, which consists of a series of four reports, presents an analysis of medical care costs based upon a field study conducted by the National Opinion Research Center. For this purpose, an "area probability" type of sample was taken of the general population; information was thus obtained by single interviews of 2,809 families, comprising 8,846 individuals. The amount of medical care costs incurred by these individuals and the insurance protection available to meet these costs were analyzed by age, sex, income, size of family, occupation, region of domicile, and whether living in urban or rural location. The reports also analyze the utilization of medical care, comparing utilization by uninsured persons with that by insured persons. Data are also presented with respect to indebtedness incurred because of medical expenses. On the basis of these sample data, estimates were made of national aggregates. While these aggregates are reasonably close to other independently made estimates of total coverage and total medical care expenditures, substantial deviations are noted in some of the components. For example, the present report gives total hospital care costs for the nation for 12 months through June 1953 as \$2,000,000,000, and total physicians' charges as \$3,800,000,000, whereas figures in the December 1953 *Social Security Bulletin*, based upon Department of Commerce estimates, show expenditures in 1952 of \$2,794,000,000 and \$2,879,000,000, respectively.

U.S. Department of Health, Education, and Welfare, *Characteristics of Recipients of Aid to the Permanently and Totally Disabled, Mid-1951*, Public Assistance Report Number 22, Washington, 1953.

This report contains the results of a sample study made in 1950 and 1951 of recipients of public assistance in 30 states. It was based on a study of nearly 18,000 cases out of a total of approximately 99,000. These data were analyzed by age, sex, race, mobility, living arrangements, past employment, and other social characteristics of the recipients. Analysis was also made by the nature of the impairment or disease and the medical and rehabilitation services provided.

The Joint Committee on Health Insurance, *Financing Health Services in Canada*, pp. 31, Toronto, 1954.

The publication of this booklet was sponsored by the Joint Committee on Health Insurance which was organized in 1953 by The Canadian Life Insurance Officers Association and the All Canada Insurance Federation. It tells how Canadians have voluntarily obtained a great measure of protection against the financial hazards of accident and sickness. In addition to describing the range and extent of voluntary accident and sickness insurance, it also deals with the health services provided by the various levels of government. The booklet concludes by stating that "the combination of insurance protection and basic government services has already gone a great distance to meet the needs of Canadians" and points out that "each year sees a significant reduction in the number of Canadians for whom the financing of health care is a problem."

SOCIAL SECURITY

House of Representatives, *Message from the President of the United States Transmitting Recommendations Relating to the Old-Age and Survivors Insurance System and the Federal Grant-in-Aid Programs for Public Assistance*, H. Doc. 295, 83rd Congress, 2nd Sess., 1954, pp. 6.

Under these recommendations OASI would be broadened to include most groups not now covered, except that no recommendation is made for Federal employees because a study on this subject is currently nearing completion. The retirement test would be liberalized somewhat by putting earnings on an annual basis, and benefits would be increased for those on the roll now and also in the future. The taxable wage base would be increased from \$3,600 to \$4,200, and the calculation of the average monthly wage would be revised to eliminate the four lowest years of earnings. A "waiver of premium" provision would be introduced for those totally disabled for an extended period. It is stated that costs will increase by about $\frac{1}{2}\%$ of payroll on a long-term basis. However, the increases in cost will be met for at least the next 15 to 25 years under the present contribution schedule. The formula for determining the Federal share of the cost of public assistance would be revised to take into account the fiscal capacity of the States and the proportion of each State's aged population eligible for OASI benefits.

Myers, R. J., and Razor, E. A., "Long-Range Cost Estimates for Changes Proposed in the Old-Age and Survivors Insurance System by H.R. 7199, with Supplementary Estimates for Universal Coverage," *Actuarial Study No. 38*, Social Security Administration, Washington, D.C., March 1954.

Detailed long-range cost estimates are presented for the old-age and survivors insurance program as it would be modified by the bill H.R. 7199 embodying President Eisenhower's recommendations. There is, in addition, a discussion of the effect of extending coverage to the relatively few groups not included in these recommendations.

Items decreasing costs are the extension of coverage and a rise in the wage base from \$3,600 to \$4,200 a year. Increases in cost result from: (a) the proposed increases in benefits under the new formula; (b) elimination of the four lowest years of earnings in computing benefits; and (c) preservation of benefit rights for persons totally disabled for extended periods. On the one hand, the changes in the retirement test increase costs by raising the exempt amount and by placing the test on an annual basis; on the other hand, costs decrease by having a single test for employees and self-employed, and by applying the test to all earnings rather than only to covered earnings. On a level-premium basis, according to the intermediate estimate, the net effect is an increase in cost of about $\frac{3}{8}\%$ of payroll. In order to meet this increase in cost to a considerable extent, the ultimate employer-employee contribution rate (in 1970 and after) would amount to $\frac{3}{8}\%$ of payroll, with a corresponding change in the rate for the self-employed. Consideration is given to the effect of the higher actual interest earnings of the trust fund (namely, at a rate of 2.4%), as contrasted with the valuation rate of 24% previously used.

Curtis, C. T., "My Proposals for Improving Social Security," *American Economic Security*, January-February 1954.

Congressman Curtis, Chairman of the Social Security Subcommittee of the House Ways and Means Committee, sets forth his personal proposals on social security and

supports them by quoting the views of the late Senator Taft. The proposals include changes in the OASI system and in the public assistance provisions of the Social Security Act. The OASI changes would be: universal employment coverage; liberalization in the retirement test; elimination of employee taxes after age 65 for persons with 10 or more years of coverage; raising the minimum benefit for a retired worker to \$45 a month; "blanketing-in" for the minimum benefit all aged persons who do not possess insured status and also orphans and widowed mothers in the case of deceased men who were not so insured; certain restrictions on payments of benefits to individuals living in foreign countries; and an extension of the social security tax to all annual income and earnings up to \$3,600, irrespective of their sources. At the same time, the public assistance provisions would be changed to eliminate the Federal share of old-age assistance and aid to dependent children.

Chamber of Commerce of the United States, *Improving Social Security*, pp. ix, 128, Washington, D.C., 1953.

In its recent social security policy declaration, the Chamber of Commerce has proposed that OASI coverage be made universal, the current aged be "blanketed-in" for the minimum OASI payment, the OASI system be financed on a pay-as-you-go basis, and the Federal grants for old-age assistance be eliminated. This approach is explored in the present report, which is based on a study and analysis of the social security program by Leonard Calhoun. The first three chapters give the background of the present program and the experience in certain selected states, showing the duplication between OAA and OASI. The fourth chapter analyzes the effect of the Chamber proposal on the OAA programs. Four succeeding chapters deal with the problem of universal coverage—what categories are not now included; how universal coverage will correct shortcomings of OASI; what OASI really is, and is not, in its basic philosophy (*i.e.*, "is it insurance?"; etc.); and also with the logic of "blanketing-in" the unprotected aged at the time universal employment coverage is achieved. The ninth chapter discusses the desirable size of the minimum OASI benefit in the light of existing data on income and resources of the aged. The last chapter discusses various financing methods, such as whether there should be a contribution from the general treasury and, specifically, what the cost of the Chamber proposal is and how it should be financed. The cost estimates indicate that on the whole the cost of the Chamber's proposals could be met over the next 20 years by the present contribution schedule, and that the system would then be on a more nearly pay-as-you-go basis.

Linton, M. A., "The Social Security Outlook," *Michigan Business Review*, July 1953.

In this summary of his views on many aspects of social security, Mr. Linton first counters the argument that the OASI program is socialistic. He then gives the reasons for universal coverage and also for modification of the present work clause. The true role of social insurance is discussed; it is pointed out that the benefits should provide a real floor of protection, but should not be too large. Policy and procedure in financing social insurance are also considered. The author refutes the argument that the OASI trust fund is a fiction and involves double taxation. At the same time, he tells why he is opposed to large accumulations in the future. The paper concludes with a recommendation for "blanketing-in" the presently retired aged persons who do not possess insured status, and with a statement of the author's general philosophy on social insurance—its necessity in industrialized life, its public appeal and support, and the potential dangers of unduly large benefits.

Myers, R. J., "Actuarial Aspects of Financing Old-Age and Survivors Insurance," *Social Security Bulletin*, June 1953.

The various methods of financing the OASI program under the several amendments since it was instituted in 1935 are discussed. The question of what is meant by the term "actuarially sound" is examined, as it differs between its application to private pension plans and to social insurance. The OASI trust fund is considered with regard to its investment procedures and to its validity and necessity. Pro and con arguments are presented as to the need for a large trust fund, considering both stable and inflationary economic conditions.

Blagden, H. E., "Realistic Timing of Contributions to Finance Federal Old-Age Benefits," *American Economic Security*, October-December 1953.

The differences in the financing of private pension plans and of social insurance systems are discussed. The arguments in favor of full funding of private plans are first presented and then reasons are given to show why this does not apply to the old-age and survivors insurance system. For OASI financing, the author proposes a pay-as-you-go basis but with a definite contingency reserve which would operate in a flexible manner during the business cycle. Under this proposal, the tax rate would be determined each year in units of $\frac{1}{2}\%$ of payroll for the employee tax and likewise for the employer tax. The tax rate would remain unchanged if the estimated operation of the system in the next year would yield a balance in the fund exceeding a certain specified percentage of estimated payrolls for that year, such as 20%.

Myers, R. J., "Old-Age and Survivors Insurance: Retirement Test Experience" and "Basis and Background of Retirement Test," *Social Security Bulletin*, November 1953 and March 1954.

These two articles deal with the retirement test provisions under which OASI benefits are withheld from an otherwise eligible beneficiary if he performs substantial work in covered employment. The provisions contained in various versions of the law since the original act of 1935 are outlined as well as corresponding provisions in other Governmental systems and in private plans. The necessity for such a test is also discussed, especially from the cost standpoint. Various proposals that have been made to answer some of the public criticism of this test are considered, under which low-wage or intermittent employees would be permitted to receive full or partial benefits instead of a sharp cut-off as under present law. The experience under the retirement test for 1940-52 indicates that the average retirement age is currently about 69 years for men and somewhat over 68 for women; before 1951 these averages were about 1 year higher. At the end of 1952, there were almost $1\frac{1}{2}$ million persons still at work in covered employment who, but for the retirement test, would have been drawing benefits involving an annual outlay, including dependents benefits, of close to \$ $1\frac{1}{2}$ billion or somewhat more than 1% of payroll.

Myers, R. J., "Survivor Benefits After Disaster: An Actuarial Analysis," *Social Security Bulletin*, February 1954.

The three tornado disasters in 1953 (Flint, Waco, and Worcester) took a toll of 318 lives, of whom almost half were insured under the OASI program. Survivor benefits may eventually total \$1.2 million with respect to these deceased workers. The article analyzes the characteristics of these beneficiaries and illustrates the survivor protection

furnished to two families. In one instance, survivor benefits may total as much as \$27,600, while for the other the corresponding figure is \$36,000.

OTHER TOPICS

F. J. McDiarmid, *Investments of Life Insurance Companies in the United States and Canada*, pp. ix, 148, Life Office Management Association, New York, N.Y., 1953.

This book provides an excellent introduction to the study of life insurance investing. The place of life insurance investments in the nation's savings is explored and the mechanism of acquiring investments is discussed with some emphasis on private placements. A brief outline of what can be obtained from financial reports follows. The bulk of the work deals with the particular features of each of the different types of investment. There are also chapters on legal regulation and valuation. It is the general reference in our course of reading for students.

J. W. Graham, "Investment Opportunities in Canada for Life Insurance Companies," *Association of Life Insurance Counsel Proceedings*, vol. 11, p. 797, 1953.

Topics included in this comprehensive 100 page survey cover the entire investment field. A digest of Canadian investment laws from 1910 to date is followed by summaries of similar laws in Connecticut, New Jersey and New York. Distribution of Canadian assets of Canadian, British and United States companies are tabulated and discussed. Half the paper is devoted to investment opportunities, which are presented separately for each type of investment. There are thirty statistical tables.

R. Carlyle Buley, *The American Life Convention, 1906-1952, A Study in the History of Life Insurance*, 2 vols., pp. xxx, 1397, Appleton-Century-Crofts, Inc., New York, 1953.

This detailed history of the growth and activities of the American Life Convention traces its career against the background of economic and social developments in the United States and Canada. Accordingly, the work is of much broader scope and interest than would be a bare recital of events in the lifetime of a trade organization.

In order to provide a setting for the growth of life insurance in the United States and for the events that led to the formation of the American Life Convention, the author deals first with life insurance in Europe. Following this, full attention is given to the development of life insurance in the United States and Canada during the latter half of the nineteenth century, a time appropriately characterized as the period of "growing pains." The abuses of that period culminated in the Armstrong Investigation of 1905. In the years following the Investigation there was, among other things, a growing spirit of cooperation among life insurance companies in an effort to solve the many problems facing them. As one evidence of this, a few small western companies formed the American Life Convention in 1906.

Although the American Life Convention started with only a few companies as members, it soon came to fill many vital functions and grew steadily. At the present time its membership comprises companies having 97% of the insurance in force in the United States and Canada. As the organization grew in size, its range of activities widened to cover nearly every aspect of the business of life insurance, and, as the author brings out, the present condition of the Convention is far from static. It is growing and there is a vision of an ever increasing usefulness of the Convention to the life insurance companies of this continent.

Harold E. Raynes, *A History of British Insurance*, pp. vii, 397, Sir Isaac Pitman and Sons, Ltd., 1948.

This book presents a comprehensive history of commercial insurance in Britain and deals not only with life insurance but also with other forms such as marine and fire. Concerning life insurance, the author starts with its beginnings in the late sixteenth century, refers to the founding in 1706 of the Amicable Society for a Perpetual Assurance Office, and describes how the principles of actuarial science gradually became known following the formation of the Equitable Life Assurance Society in 1762. The volume quotes liberally from the provisions of early contracts and from original documents relating to the history and constitution of the British companies.

R. L. Michaelson, "Large-scale Electronic Digital Computing Machines," *Journal of the Institute of Actuaries*, Vol. 79, Part 3, p. 274, 1953.

This paper provides a general introduction to large-scale electronic computers. It gives a functional description of the components of such computers, asking the reader to accept the existence of devices with the stated properties. The paper also describes the representation of numbers by pulses in the binary system, discusses various types of storage, and explains the purpose of input-output mechanisms and of control units. It then develops the concept of a program as a set of instructions, and demonstrates the manner in which computers automatically go from one step to the next. A simplified set of typical instructions is applied to a specific problem.

The paper also deals with questions of speed and reliability and discusses the use of computers in the life insurance companies. Detailed reference is made to the Special Presentation and Discussion by the Society of Actuaries Committee on New Recording Means and Computing Devices in 1952. An extensive bibliography is included.