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BOOK REVIEWS AND NOTICES

Robert J. Myers, *Social Security*, pp. xxviii, 691, published for the McCahan Foundation by Richard D. Irwin, Inc., Homewood, Ill. 60430, 1975, $10.95.

This book is a major reorganization and revision of the author's *Social Insurance and Allied Government Programs* published in 1965. It includes a 177-page section on medicare, which had not been enacted at the time of the original publication. This medicare section is a revision—both a condensation and an expansion—of the author's book entitled *Medicare*, which was published in 1970.

Of course the author is unrivaled in his qualification to compile such a massive work, having devoted his working lifetime to the subject matter: first, serving with the original Committee on Economic Security, which preceded the enactment of the federal social security legislation in 1935; then serving as chief actuary of the Social Security Administration from 1947 to 1970, important years during which critical changes were made in the program; and finally, since 1970, simultaneously playing the roles of author, educator, critic, and consultant on social insurance matters. In addition, the author has served as a consultant on social insurance and related matters to many nations around the world.

The author, by virtue of his extensive experience and diligent work, has produced a comprehensive and authoritative 691-page volume on social security programs in the United States. This includes the old-age, survivors, disability, and health insurance benefits provided under the Social Security Act and popularly referred to in this country as "social security," as well as the "allied programs" of public assistance, railroad retirement, unemployment insurance, workmen's compensation, cash sickness, and special programs for government employees and veterans. In addition, a chapter is devoted to a brief description of the national social insurance systems of some two dozen countries around the world, including the principal industrialized nations. The book deals only with statutory programs and does not include information on the significant amount of protection provided through private-sector organizations: insurance companies, Blue Cross–Blue Shield plans, trusteed pension plans, group practice prepayment plans, and various formal and informal self-insured plans. In this connection it should be noted that the benefits described in Chapter 16 for government employees and veterans (retirement benefits, life and health insurance benefits, and others) are presumably included in the book because they are "statutory benefits." The same types of benefits provided for nongovernment employees are not included in the book.

The book serves many purposes (besides helping students pass actuarial examinations). It provides valuable history, particularly financial history. It is a good description of the present law and contains more details about the program than the average reader will want to know. It is replete with facts and figures and tables that were the latest available at publication. Some of the sections that contain much detail may soon be out of date, but they will continue to serve as convenient historical references. The book is an invaluable tool for study and reference by all those who seek understanding and perspective about the history and current operation of the social security programs included in the book and how they may evolve in the future. If the average group which gathered to discuss the OASDI and medicare programs had read Mr. Myers' *Social Security*, the discussion time would be reduced by one-half; if they had studied it carefully, the discussion time would probably be reduced by three-fourths.

Except when the author is reciting facts, this is a "personal" book, that is, a book that could not have been written by any other actuary. The book contains a large number of the author's personal opinions and observations. This makes it much more interesting and readable; however, the beginning student of social security would be well advised to read the book discerningly so that he can determine which statements are indisputable and which statements represent the author's opinions and thus are not necessarily agreed upon by all the experts. Unfortunately, it is not always easy to distinguish between the two. For example, the author is staunchly against the use of general revenues to solve the growing financial problems of OASDI for several reasons, many of which are stated clearly and often throughout the book, usually in such a manner that the reader can evaluate for himself the merits of the arguments. However, in discussing this issue, the author states several opinions as if they were facts. On page 136: "After all, the incidence of taxation as between payroll taxes and general revenues is not so vastly different, especially after tax impacts are absorbed and redistributed among groups." And on page 197: "Although there may be some difference in the incidences of taxation for various taxes, these tend to gravitate in the same direction over the long run." If these quoted statements were generally accepted as valid, there would be considerably less argument over whether it is more appropriate to use payroll taxes or general revenues to finance the social security program, since, to many of the proponents of using general revenues, the ultimate incidence of taxation is a very important part of the controversy.

Two chapters deserve particularly careful attention in view of the public debate over the OASDI and medicare programs, which is now beginning to intensify. Chapter 9 discusses the possible future development of the medicare program, and Chapter 5 discusses directions and issues in the OASDI program. This latter chapter of 40 pages replaces its counterpart of only 9 pages in the predecessor book—an indication of the dynamic state of social security now as compared with 1965. Still, in this reviewer's opinion, Chapter 5 is found lacking. For example, it does not give enough emphasis to the changing role of women and of the family unit in our social and economic order, and the demands this will generate for drastic revisions in the program's benefit structure. The issue is more than just a question of equal treatment of men and women. Also, not enough attention is given to alternative approaches to financing, even in view of the very real possibility of an increase within the next fifty years in the cost of the OASDI and medicare programs from the current 12 per cent of taxable payroll to 25–30 per cent of taxable payroll—even assuming no further liberalizations. In Chapter 5 as well as in certain other portions of the book, the author seems to take a posture of defending his own opinions, whereas it might have been more constructive to play the futurist and attempt to stimulate.

Solutions to social security's problems are going to require imaginative approaches, an active opposition to the status quo, a broaching of ideas which will probably seem wild-eyed now but which will in the end lead to rational solutions. Actuaries are trained in predicting the long-range consequences associated with assumptions about future demographic and economic behavior. Actuaries should play a more active role in postulating various models of the future and in communicating their consequences to the public.

In Chapter 5 the author outlines three philosophies concerning the role a social security program should play in the nation's economic and social life: a laissez-faire philosophy held by a relatively small number of people who are in complete opposition to a social insurance program; an expansionist philosophy which advocates that full economic security needs be met by government programs; and a moderate philosophy which advocates complementary roles for social insurance and private insurance systems. The author states that the future development of the OASDI system will be influenced by the relative acceptance of these philosophies.

This portrayal of the situation may give some readers the impression of three groups of philosophers sitting around debating and determining the future of the OASDI program, whereas, in fact, the future of the OASDI program will probably be determined through the philosophy of pragmatism—not one of the aforementioned philosophies—based upon factors such as the following, to name just a few:

Inflation.—If the nation experiences sustained inflation at relatively high levels, it is likely (in this reviewer's opinion) that the portion of an individual's economic security needs which can be met by the private sector will decrease over time; the needs must somehow be met, and the federal government (probably through the OASDI program) will be left as the only entity with the audacity to make unqualified promises to pay benefits seventy-five to one hundred years in the future based upon indeterminable cost-of-living increases.

Social and economic changes.—The changing role of the family unit and of women; changing patterns in the incidence of work, education, and leisure throughout a person's lifetime; lengthening life expectancy and improved health in old age; a reduced (or increased) need to work in order to maintain the desired standard of living—all of these changes and more will require that drastic revisions be made in the benefit structure if the evolving economic security needs are to be satisfied appropriately.

Public understanding and attitude.—In the future, public understanding, or misunderstanding, is likely to play a more dynamic role in determining the shape of the program than it did in the past when the payroll tax was relatively low and the taxpayer was in a less questioning frame of mind. For example, a shift in the public's perception of the program could result in the acceptance—even the demand—of a source of financing other than the traditional payroll tax. And, as the author makes clear, acceptance of a change to general revenue financing could result in a further change in public attitude, which in turn could generate still further change in the basic nature of the program. In this connection (on p. 205), the author, in discussing the importance of maintaining the "insurance concept," states: "To destroy this concept would very likely result in the destruction of OASDI and change over to a public assistance program, with all the inherent weaknesses of such an approach."

It follows from the preceding discussion that a person who wants to influence the future direction of the OASDI program cannot simply adopt a philosophy and then attempt to change the program to suit that philosophy. He must try to understand the basic economic security needs which the OASDI program is trying to meet, and redesign the program so that it meets those needs in the best way. If the resulting program would be inconsistent in any way with the philosophy of the program designer, he should attempt to change the social and economic factors that generate the needs. It will not be enough to leave those needs unmet just because they are in conflict with a particular philosophy. Of course, the economic security needs and the program design are not completely independent of one another. For example, a program which meets all of a person's needs will, in due time (according to this reviewer's perception of life), result in the expansion of these needs and thus the further expansion of the program. This is the author's point when he states on page 179 that the moderate philosophy believes "that full economic security provided in this manner would be bad for the character and moral fiber of the nation."

In the appendix to Chapter 5 entitled "Comparison of Actuarially Purchasable Benefits with Actual Ones," the author makes comparisons for various hypothetical employees of social security taxes paid with age-retirement benefits received. Some of these comparisons are easy to understand and could not be misinterpreted easily—for example, comparisons regarding persons retiring in the early 1940's after having participated for only six quarters. Other comparisons are more complicated. It somehow seems inappropriate to consider male workers who survive to age 65 and form conclusions about whether an individual receives his money's worth from his social security taxes, without considering at the same time single male workers who die before retirement as well as other categories of workers whose taxes sometimes result in little, if any, benefits being paid. The author acknowledges the difficulty of making such calculations and comparisons on a theoretically correct basis and summarizes the discussion by saying that precise conclusions cannot be drawn in all respects. Nevertheless, such calculations are made on a simplified basis and are presented, and conclusions are drawn. Although it is not obvious from reading the appendix, many of these conclusions are based upon the author's substantial experience and his "feel" for such matters and not solely upon the examples quoted in the text. An actuary reviewing the calculations and conclusions is in a position to recognize their limitations and to interpret them accordingly. However, this is not true of other readers, and there is a chance the figures will be misunderstood and misused.

In this appendix as well as in other portions of the book, the author takes the position that only employee taxes (and not employer taxes) should be considered in any determination of whether the employee receives his money's worth. As the author says, this point is debatable. Moreover, a question being asked more frequently is whether the nation, and not just the employee, receives its money's worth from social security taxes. To answer this question in terms of the redistributive effect of social security requires that combined employee and employer taxes be compared with benefits received. For example, in the appendix under discussion the author concludes that, "if only high-salaried younger workers are considered, there is probably about a standoff—that is, on the average, their taxes approximately 'purchase' their benefits." If this is true, such employees receive no value, at least directly, for employer taxes, and one must conclude that such employer taxes are used for the benefit of lower-paid employees in the present generation and/or that they represent an added cost to the current generation because of prior generations' having received larger benefits than were provided by their combined employer and employee taxes. A more complete answer to this question of the redistributive effect of social security on both an intragenerational basis and an intergenerational basis would be most interesting and valuable to our understanding of the consequences of a gigantic social security program financed on a current-cost basis.

Now, more than ever in the past, there is broad public interest in how social security works and how it can best serve its present and future beneficiaries as well as the taxpayers who support it. If public confidence in social security is to be restored, it is important that there be a closer match between the public perception of the program, on the one hand, and the reality, on the other. However, the transition to this clearer understanding will be quite difficult, if not impossible, to achieve on an orderly basis. Actuaries are uniquely qualified to participate in this intensifying dialogue, but not without first learning more about social insurance, and the OASDI and medicare programs in particular. Mr. Myers' latest volume, *Social Security*, is the place to begin, in this reviewer's opinion.

A. HAEWORTH ROBERTSON

Special Committee on Valuation and Nonforfeiture Laws, *Report on Actuarial Principles and Practical Problems with Regard to Nonforfeiture Requirements*, pp. 85, Society of Actuaries, Chicago, Ill. 1976.

This comprehensive report on nonforfeiture requirements builds upon the principles of the report of the 1941 NAIC Committee to Study Nonforfeiture Benefits and Related Matters. Using the same theoretical starting point of the principles of equity, this committee concludes that the basic structure of the Standard Nonforfeiture Law needs no change but that certain inflexibilities in the law can be improved with a few changes. The minimum required reading for this publication is the first chapter, which outlines the assignment given to the committee and its conclusions. Reading through the list of conclusions gives one a chance to determine those which will have a significant impact on the industry and on nonforfeiture laws.

The committee does not actually *recommend* a new formula for computing the expense allowance for minimum cash values, but does list several formulas which were used for testing purposes. One of these, which was used for several different plans of insurance, would seem to be the one that this committee would recommend to the NAIC (if any recommendation were to be made):

$$E^1 = 0.50\begin{bmatrix} P \\ 0.05 \end{bmatrix} + 0.50\begin{bmatrix} P \\ OL \\ 0.05 \end{bmatrix} + 0.01\ ,$$

with the smallest of the quantities in each bracket to be used.

The current formula is

$$E' = 0.40\begin{bmatrix} P^a \\ 0.04 \end{bmatrix} + 0.25\begin{bmatrix} P^a \\ OL^a \\ 0.04 \end{bmatrix} + 0.02\ ,$$

where the superscript refers to adjusted premiums. Note that the new formula refers to net level premiums instead of adjusted premiums, thus eliminating the circularity of the current formula for expense allowances. After examining the expense assumptions for several major companies in the United States and Canada, the committee used as a specimen median for the expense allowance (excess of first-year over renewal expenses) \$10 per \$1,000 of insurance plus 100 per cent of the level net premium according to the 1958 CSO Table ($3\frac{1}{2}$ per cent) for the ordinary life plan. For plans of insurance other than ordinary life, the committee used, because of sales compensation differences, equal weight on the plan and ordinary life premiums in the percentage allowance of the revised formula, instead of 8/5 weights. Compared with the current expense allowance formula, this new formula has the effect of raising the minimum cash values at ages under 50 for ordinary life, twenty-payment life, and twenty-year endowment and lowering the minimum cash values at ages over 60 for these three plans.

Another major change proposed for the Standard Nonforfeiture Law is the use of a single interest rate for minimum cash values. This change would have the advantage of uniformity of minimum cash values for similar plans in different companies, convenience to the policyholder and regulatory bodies, and simplicity of cash-value testing for the industry. In addition, the committee recommends that any company be allowed to use an interest rate no greater than the statutory rate for the actual policy cash values and that the valuation interest rate be no greater than either of the other two rates.

A large part of the committee's report deals with the problems that the Standard Nonforfeiture Law poses for new, innovative policies. Many of these policies today are flexible premium policies with varying death benefits, some of which may not be specified at the time of issue. The law as written in the 1940's certainly did not envision policies of this type, and therefore it is too inflexible to allow the widespread introduction of these new policies. Several changes are suggested in the law that would allow the introduction of these policies with reasonable nonforfeiture requirements. The four types of policies involved are two policies where future changes are defined at issue (those with varying death benefits, on the one hand, and those with varying gross premiums) and two policies where future changes depend on future events ("multitrack" policies and "open" policies). The suggested solutions are reasonable and include the following:

1. Policies with varying death benefits would still use an "equivalent uniform amount" formula, but only variations within the first ten years would be taken into consideration.
2. Policies with varying gross premiums would have their expense allowance based on the net premium for an identical policy which has level gross premiums.
3. Multitrack policies typically have a "main track," and minimum cash values can be determined on the basis of the usual prospective formula, assuming that the policy remains on the main track. If the policyholder should choose an option that lowers premiums, the expense allowance would not be changed. On the other hand, if the premium were increased, the expense allowance in the cash-value formula could also be increased, because in most cases the company would pay additional compensation.
4. Open policies include CPI-indexed policies and life-cycle policies. It was the committee's feeling that the prospective minimum-cash-value formula is appropriate for these plans, if the assumption is made that changes which are not stated in the policy will not occur. When a change in either benefits or premiums does occur, a new adjusted premium must be calculated, and minimum cash values would be based on the revised adjusted premium. Assuming that commissions will be paid on premium increases, the committee decided that the full increase in the expense allowance should apply to premium increases. Although this may create some problems in that minimum cash values after a premium increase may actually decline, it is unlikely that competition would allow any company to decrease the cash values guaranteed to the policyholder.

The committee also discussed a completely flexible policy, which would require premium deposits at the option of the policyholder and an amount of death benefit elected by the policyholder. The report argues for exempting these policies from the Standard Nonforfeiture Law and allowing the marketplace to regulate the loadings on these policies after requiring their disclosure. Another recommendation is that a central body, such as the NAIC Central Office, review these flexible policies for actuarial soundness. This recommendation has the merit of allowing companies to speed up the process of state submissions.

The committee did not go as far as to make specific recommendations for the interest rate and mortality table to be used in computing nonforfeiture benefits, although it did recommend that a single interest rate be used to calculate the minimum required for all policies issued by all companies. It did, however, test the effect of using a higher interest rate and of using a mortality table more in line with current experience than the 1958 CSO Table. The results showed that significant decreases in minimum cash values occurred primarily because of the increase in the interest rate. The important process of choosing an interest rate to be recommended to the NAIC, however, has been assigned to the Society's Committee on Economics and Finance. The committee also studied the mortality rates for females and decided that the current use of a three-year setback permitted in the law is no longer appropriate. A better approximation (at least for ordinary life) is a six-year setback, and this is the committee's preferred method over the introduction of a separate female table into the calculation of nonforfeiture values.

One exception to the general rule of using the prospective method for computing minimum cash values should apply to deferred annuities, and the committee recognized that several state regulations and an ALIA proposal use this method. For flexible premium annuities the committee did not make a recommendation except to say that further study on minimum nonforfeiture requirements was needed. One reasonable suggestion was to follow the "open policy" concept, where additional loading percentages are permitted when premiums are increased.

After concluding that the basic structure of the Standard Nonforfeiture Law did not need any change, the committee investigated many items and stated that the above changes seemed to be desirable modernization. In addition, the committee suggested many changes to simplify the working of the law. Among these are a test for triviality to determine which policies should be exempted from nonforfeiture requirements, suggested treatments of term riders and renewable term policies, and more flexibility for insurance companies in the other nonforfeiture options—reduced paid-up and extended term insurance.

The Society is indebted to the Committee on Valuation and Nonforfeiture Laws for the excellent job they have done in putting together this report. It is hoped that the report will induce significant changes in the Standard Nonforfeiture Law, making it more flexible in its application to innovative products and more practical for insurance companies to comply with in the calculation of nonforfeiture benefits.

WILLIAM H. BOWMAN

Carl L. Erhardt and Joyce E. Berlin (eds.), *Mortality and Morbidity in the United States*, pp. xxv, 289, Vital and Health Statistics Monographs, Harvard University Press for the American Public Health Association, Cambridge, Mass., 1974, $10.00.

The publication of this volume by Harvard University Press completes the series of Vital and Health Statistics Monographs initiated by the late Mortimer Spiegelman, F.S.A., in 1958. The work was carried out in the offices of the Metropolitan Life Insurance Company until Mr. Spiegelman's retirement in December, 1966. He then devoted his full time to the monographs at the offices of the American Public Health Association until his untimely death in 1969. Dr. Carl L. Erhardt completed the job.

This sixteenth volume in the series analyzes mortality and morbidity trends in the United States since the beginning of the century, with particular attention given to the 1960's. Data are presented by age, sex, race, marital status, geographic region, and for various causes of death and illness.

Other specialists provide coverage of such subjects as health, illness, disability, and the use of medical service by the aged, as well as projections of health service personnel and facilities, infant mortality, and variations in mortality, morbidity, and health care by marital status. International comparisons of mortality and longevity are also presented. There are many tables and figures, an extensive set of references, and a detailed index.

Rapid change in the interval from data collection to publication has diminished the value of some of the material. However, a good deal of it has not been published elsewhere, nor is there any comparable compilation with such useful cross classifications.

The fifteen volumes published earlier are as follows:

Accidents and Homicide by Albert P. Iskrant and Paul V. Joliet

Infectious Diseases by Carl C. Dauer, Robert F. Korns, and Leonard M. Schuman

Trends and Variations in Fertility in the United States by Clyde V. Kiser, Wilson H. Grabill, and Arthur A. Campbell

Infant, Perinatal, Maternal, and Childhood Mortality in the United States by Sam Shapiro, Edward R. Schlesinger, and Robert E. L. Nesbitt, Jr.

Tuberculosis by Anthony M. Lowell, Lydia B. Edwards, and Carroll E. Palmer

The Epidemiology of Oral Health by Walter J. Pelton, John B. Dunbar, Russell S. McMillan, Palmi Moller, and Albert E. Wolff

Syphilis and Other Venereal Diseases by William J. Brown, James F. Donohue, Norman W. Axnick, Joseph H. Blount, Neal W. Ewen, and Oscar G. Jones

Marriage and Divorce: A Social and Economic Study by Hugh Carter and Paul C. Glick

Digestive Diseases by Albert I. Mendeloff and James P. Dunn

The Frequency of the Rheumatic Diseases by Sidney Cobb

Cardiovascular Diseases in the United States by Iwao M. Moriyama, Dean E. Krueger, and Jeremiah Stamler

Cancer in the United States by Abraham M. Lilienfeld, Morton L. Levin, and Irving I. Kessler

Mental Disorders/Suicide by Morton Kramer, Earl S. Pollack, Richard W. Redick, and Ben Z. Locke

Epidemiology of Neurologic and Sense Organ Disorders by Leonard T. Kurland, John F. Kurtzke, and Irving D. Goldberg

Differential Mortality in the United States: A Study in Socioeconomic Epidemiology by Evelyn M. Kitagawa and Philip M. Hauser

FREDERIC SELTZER

The Fifty-Second Annual Report of the Board of Actuaries of the Civil Service Retirement System, House Document No. 94-203, U.S. Government Printing Office, Washington, D.C., 1975.

Both the title and the dull format in the usual Government Printing Office style would seem to ensure this document's instantaneous consignment to dead storage. However, behind the cover of this small pamphlet is a concise, well-written report discussing a number of the issues facing not only federal pension programs at the present time but all pensions in an inflationary economy. For example, several of the 11 pages devoted to the main report discuss the implications of "static" assumptions (ignoring inflation) as opposed to "dynamic" assumptions (including inflation).

The report is a valuation of the civil service system as of June 30, 1972. In addition to presenting conventional cost figures consistent with previous reports, it also expands substantially upon this in several ways:

1. In spite of the fact that the 1972 normal cost rate (13.64 per cent) turned out to be less than the agency-employee contribution rate (14 per cent), the Board of Actuaries recommended no reduction in the last because of the uncertainties surrounding the other matters discussed in the report.
2. The board pointed out that, under the static assumptions, future inflation was not considered on the liability side of the ledger (in the form of an inflationary salary scale). On the other hand, the current inflationary trend surely had affected the assumed interest rate (5 per cent), the key ingredient on the potential asset side.
3. Going further than just making the above statement, and indeed going further than required by law, the board presented tables demonstrating the effect on costs of two sets of inflation assumptions.

Students of the fine points of funding federal plans may wish to review Walter Shur's excellent paper of several years ago entitled "Financing the Federal Retirement Systems" (*TSA*, XVI, 265). Mr. Shur pointed out that the "problem of federal retirement plan financing is inextricably woven into the fabric of over-all fiscal policy." Thus, as Mr. Shur noted elsewhere, higher federal taxes to fund federal systems would result in a transfer of debt (the funds' increased assets) from the public to the retirement funds. "If higher taxes will put the economy of the future in a better position to bear the burden of retirement payments, then higher taxes are desirable with or without a reserve method of financing and the point should be argued on economic grounds, not on actuarial grounds." Despite this argument, Mr. Shur recommended normal cost plus interest funding for the sound financing of the federal systems.

The report of the Board of Actuaries noted that such a recommendation was not their function but that it was incumbent upon them "to point out that the present approach to funding this System will lead to spiraling costs in the future, not only in dollar amounts but as a percentage of covered payroll." Apparently, projections have been made to illustrate this point, but the report itself gives adequate proof to the actuarial reader. The accompanying table of employer costs, calculated in various manners, is indicative of the current level of underfunding of this system. All figures are employer contributions approximately as of the valuation date, June 30, 1972.

	Employer Costs (in Billions)
Current contribution rate	\$ 4.1
Normal cost plus interest, static assumptions	6.8
Normal cost plus level percentage of payroll, Dynamic II assumptions	12.1
Normal cost plus 40-year level dollar (ERISA basis), Dynamic II assumptions	17.8

The static assumptions include a 5 per cent interest rate and a total annual salary increment in the 2–2½ per cent per year range. Of the two dynamic scales adopted, the one assuming the greater inflation (Dynamic II) used a 6 per cent interest rate and a total annual salary growth rate in the 5–5½ per cent range, plus the assumption that CPI increases after retirement will be at the rate of 4 per cent per year. Because of the effect of the well-publicized "kicker" in the system's formula for calculating cost-of-living increases, the 4 per cent annual CPI growth rate assumption translates roughly to a 5.2 per cent annual increase in retired life benefits.

The report discusses the problem produced by applying ERISA standards to the civil service plan, which is not governed by ERISA. The report points out that "the past service funding requirements of . . . ERISA . . . seem to require level dollar funding. . . . Whether a level percentage of payroll funding of past service would be acceptable under ERISA for an inflation-indexed plan such as the civil service plan is problematical." This topic will probably receive increasing attention in the private sector in the next few years, as actuaries become more familiar with ERISA requirements and at the same time presumably move increasingly to inflation-adjusted actuarial assumptions.

An added bonus for readers of the report is the set of detailed statistical tables in the appendixes, including analyses of the changes in assumptions between 1970 and 1972. A major contributor to additional actuarial costs, incidentally, was the assumption changes reflecting increased rates of retirement experienced by the system between valuations.

The actuarial profession owes a debt of gratitude to the Board of Actuaries, Edwin F. Boynton, F.S.A., Douglas C. Borton, F.S.A., and Russell R. Reagh, F.C.A.

THOMAS P. BLEAKNEY
RICHARD R. JOSS

Jane H. Murnaghan, "Health Services Information in the United States Today," *New England Journal of Medicine*, 290 (March 14, 1974), 603–10.

This article describes, and more importantly identifies, information systems which are either in existence or planned on the national, state, and local levels. It describes the data available on the national level from the National Center for Health Statistics, the Office of Research and Statistics of the Social Security Administration, the American Medical Association, the American Hospital

Association, and other sources. It also describes a number of state and local information systems and addresses itself to information systems for inpatient care, ambulatory care, and the needs and likely sources of data for PSRO's.

The article provides a quick reference table for abbreviations used in health services information systems, with a very brief description thereof, and a bibliography with a wealth of references. It should be considered a valuable tool for the actuary interested in health care information.

LAWRENCE J. RUPP

Elmer B. Staats, Comptroller General of the United States, *Financial Problems Confront the Federal OASI and DI Trust Funds*, pp. 21, General Accounting Office, Washington, D.C., July 25, 1974.

This report by the General Accounting Office was prepared at the request of Congressman Wolff and is an excellent summary of the various recent studies on the financial problems confronting the OASDI system. Four of the studies have been reviewed recently in *The Actuary: An Actuarial Audit of the Social Security System* by Kaplan and Weil (April, 1975), the 1975 trustees report (June, 1975), *Report of the Panel on Social Security Financing to the Committee on Finance, U.S. Senate* (May, 1975), and *Reports of the Quadrennial Advisory Council on Social Security* (October, 1975). Also considered in the report are editorial comments by the *Wall Street Journal* that first impelled Congressman Wolff to request the GAO report.

The GAO report is essentially a recapitulation and comparison of the conclusions of the several studies and can be recommended to the reader who has not an opportunity to review the original reports.

There are one or two minor technical flaws. For example, on page 8, the report states that the Advisory Council made four "benefit" recommendations to solve the financing problems. Actually, only one of these (decoupling) was of any significance in this respect; the other three recommendations (eliminating the monthly earnings test, freezing the minimum benefit, and obtaining universal coverage) were made for other than financing reasons.

Also, at the bottom of page 12 it is incorrectly stated that the maximum taxable earnings base in 1990 will definitely be $31,800, on the basis that this figure was developed at one time by the Social Security Administration (on certain assumptions as to the future trend of wages). The report states that an individual earning $14,100 in 1975 will, according to the assumptions in the 1975 trustees report, be earning $33,880 in 1990. The latter figure is based on an annual rate of increase in earnings of 6 per cent, but this is the ultimate assumption in the trustees report, with higher rates in the short term. Under those assumptions, a person earning $14,100 in 1975 would earn $38,305 in 1990—and thus the earnings base then would be close to this level.

The GAO report did not give a specific reference to the *Wall Street Journal* article that aroused Congressman Wolff's interest. Actually, the newspaper had quite a number of articles and editorials on the subject of social security financing (including one of mine in its July 28, 1972, issue). In a later editorial than the one considered, the *Wall Street Journal* changed its position from considering the long-range deficit in terms of dollars from the "closed fund" basis referred to in the GAO report to what I believe is the far more appropriate approach of the "75-year income and outgo" basis.

ROBERT J. MYERS

Robert Tilove, *Public Employee Pension Funds,* pp. x, 370, published as a Twentieth Century Fund Report by Columbia University Press, New York and London, 1976, $20.00.

This book, which is the third on the subject of public employee retirement systems published in recent years, concentrates on the major public policy issues affecting plans of state and local governments. The two earlier publications were entitled *Protecting Purchasing Power in Retirement: A Study of Public Employee Retirement Systems,* written by John P. Mackin and published in 1971, and *Retirement Systems for Public Employees,* written by Thomas P. Bleakney, F.S.A., published in 1972, both of which were reviewed in the *Transactions.*

Two chapters will be of particular interest to actuaries, namely, Chapter 8 on "Funding" (which most actuaries are being educated to refer to as "actuarial cost methods") and Chapter 9 on "Actuarial Assumptions."

A clear explanation of the various actuarial cost methods is given in Chapter 8, with schedules and graphs illustrating typical projections assuming a constant work force. The point is made that, while there is a wide variety of actuarial cost methods available, a goal can be established as a matter of policy and an actuarial cost method designed to fulfill that goal. A list of criteria for funding policy is given in this chapter, and six separate actuarial cost methods are given as producing a more or less level percentage-of-pay contribution under normal circumstances.

The point is made that the choice of a funding policy for a public plan is different from that for a private plan, for three main reasons: (1) governments are generally perpetual and have the power to tax, (2) governments need a constant and stable base for contributions, and (3) governments need a funding policy that can withstand public debate. The author lists the following six methods which he characterizes as most appropriate:

1. Entry age normal cost with interest only on the unfunded accrued liability.
2. The "unfunded present value" system used with a schedule of percentages that establishes a level percentage-of-pay contribution.
3. A projection method over a long period of years, solved for a level percentage-of-pay contribution with no reserves beyond those produced by the leveling process.
4. Amortization of the unfunded accrued liability or some predetermined portion of it over a properly selected perpetually renewing period.
5. Designation of a portion of the accrued liability to remain unfunded.
6. Entry age normal funding with amortization over a sufficiently long period that a fully funded position is always a fairly distant goal.

The various actuarial assumptions in Chapter 9 are discussed with emphasis on the rate of salary increase and investment yield and the relationship between the two. At the end of the chapter the author discusses the relationship between actuarial assumptions and actuarial cost methods and states a preference for including among the assumptions *all* reasonably safe projections. He also advocates combining this approach with a contribution schedule that is truly essential for the retirement system, without necessarily insisting on "full funding." This contribution schedule is not defined, although it is stated that this may mean that the formula should recognize all long-term costs without trying to accumulate reserves beyond the system's actual needs based on the particular risk or remoteness of possible termination or of future limitations on ability to pay.

While this proposal seems appropriate for most public employee systems, there is one aspect of the level of funding that this reviewer thinks should be given consideration. There are two fund balances that can be available from the accounts of the system or can be developed by actuarial valuation, namely, the accumulated member contributions and the retired reserve fund representing the balances available for retired members and beneficiaries. In my opinion, the total assets of the system should never be less than the sum of the balances in the members' accounts and in the retired reserve fund, since these might both be considered as representing liabilities that should be fully funded at any given time. This posture is helpful in dealing with legislators and others who try to liberalize benefits with the plea that the assets are far in excess of the amount currently required for benefit payments. If they are made to realize that the contributing members have little if any equity in the fund besides their own contributions, although many of them have substantial vested accrued benefits, and that the liabilities for retired members and beneficiaries should be fully funded, they may be less likely to think in terms of the total assets as being available for liberalizing benefits for present pensioners and others retiring in the near future.

The current benefit level is the subject of considerable discussion, and it is concluded that plans of state and local government employees are frequently more generous than corresponding plans in private industry. It is pointed out that, while most public employee plans require substantial member contributions, this feature is more than offset by the liberality of the final average pay definition and the fact that most benefit formulas are not coordinated with social security and that the provisions for early retirement are generally very liberal. Furthermore, a high percentage of these public employee plans provide for automatic increases after retirement, frequently on the basis of the Consumer Price Index or, in cases where this is not true, by means of periodic ad hoc increases. It will be instructive to summarize the author's description of the "typical plan" (as of January, 1972):

1. *Eligibility for "normal" retirement:* Age 60 with at least ten years of service.
2. *Formula for full benefits:* For each year of service, benefit is 1.67 per cent of "final average salary" (defined as the average salary of the highest-paid five years in the last ten).
3. *Early retirement:* Age 55 with at least ten years of service, actuarially reduced from age 60.
4. *Vesting:* Benefits vest after ten years of service in form of deferred pension in full at age 60, but, if member withdraws accumulated contributions, this benefit is forfeited.
5. *Disability:* After ten years of service, disabled employee is entitled to accrued benefit based on regular formula but with minimum of 25 per cent of final average salary.
6. *Death benefit in active service:* If a member dies after ten years of service, death benefit is one year's salary; for less than ten years of service it is six months' salary plus accumulated contributions with interest. A further option is available in the typical plan if the employee dies when eligible to retire, the benefit being an annuity equal to the joint and 100 per cent survivor annuity that would have been payable had the member made this election prior to death. (The author points out that death benefits are most difficult to typify and that many systems pay survivor benefits in lieu of the payment of accumulated contributions.)
7. *Death benefit after retirement:* Actuarially reduced benefit available in the form of option.
8. *Postretirement adjustments:* Pensions will be increased annually, up to 3 per cent, based on changes in the consumer price index.
9. *Employee contributions:* Five per cent of salary, which is refunded with interest on termination of employment at the employee's option.
10. *Social security:* Employee covered by social security with no adjustment of benefits on that account.

In a chapter entitled "Goals and Limits for Retirement Income" it is pointed out that a goal of 80 per cent of final salary including social security has special significance for an employee retiring at age 65. The reason is that this level provides as much *net income* as when the employee was working. In fact, the author states that, for an employee earning $10,000 a year or more, that goal is attained when retirement income equals 75 per cent of income prior to retirement. The conclusion is therefore reached that it is reasonable to set a goal for retirement income not in excess of a full continuance of net income for the retiring career employee. This principle is used later in the book.

There are three chapters that relate to social security, the first describing the need for reform, the second discussing the merits of coverage for public employees, and the third presenting suggestions for integrating public employee systems with social security. In the second of these the question of the merits of government units electing social security coverage is very well presented, and then later the possibility of withdrawing from coverage is discussed. The question of withdrawal of public employee groups is a very lively issue at the present time, and the author's discussion is well worth reading. In view of the earlier discussion on desirable limits and goals, an example is presented in the third of these chapters suggesting that, for an employee retiring at age 65 after thirty years of service, the following benefits result would be desirable: (1) 70 per cent of final average salary, plus (2) continuance of half that amount for a surviving spouse, plus (3) full adjustment to the cost of living after retirement.

Other chapters involve the discussion of portability of pension credits, investment policies and procedures, and pension plans for policemen and firemen. The author points out that plans for the latter group inevitably require extremely high contribution rates because of early retirement ages, liberal pensions, and special provisions for service-connected death and disability.

In a later chapter covering several general policy questions, special treatment of pensions for legislators, judges, and executives in the public employee plans is discussed. An interesting question is raised whether or not the nondiscrimination requirements of the Internal Revenue Code with respect to qualified pension plans would be satisfied when such members are provided more liberal treatment than the general state employees.

Three of the last chapters are devoted to the public retirement systems in New York, Massachusetts, and Illinois. They provide a detailed insight into the problems that arise in these systems and mention the so-called leapfrogging phenomenon in which each retirement system in a state tries to outdo the others in liberalizations. Another point discussed is the growth of collective bargaining by public employees and its impact on these retirement plans.

An interesting characteristic in many of these public plans is pointed out in the final chapter, namely, the constitutional guarantee that applies to many of them. Under the constitutions of many states, or under their interpretation, the retirement benefits for a public employee may not be diminished or impaired, and this is interpreted as meaning that benefit rights, whether accrued or for future service, may not be diminished for an existing member, nor may his contribution rates be increased. Consequently, if retirement benefits in one of these systems get out of line, it is not possible to reduce them for the present membership but only for members joining in the future. Such changes have occurred in several of the large systems within recent years.

KENNETH H. ROSS

U.S. Congress, "1976 Annual Reports of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds, of the Federal Hospital Insurance Trust Fund, and of the Federal Supplementary Medical Insurance Trust Fund," pp. 81, 32, and 25. U.S. Government Printing Office, Washington, D.C., May, 1976.

The scope and the merits of these annual trustees' reports have been well described in A. M. Niessen's thorough review of the 1974 reports in *TSA*, XXVI, 649–56, and Robert J. Myers' excellent review of the 1975 reports released in a "Book Reviews" pamphlet and subsequently published in *TSA*, XXVII, 641–45. This review will briefly summarize the current condition and short-range outlook for each of the four trust funds and will then examine the assumptions employed for the long-range analyses of the OASDI accounts.

CURRENT CONDITION AND SHORT-RANGE OUTLOOK

Table 1 of this review compares the 1975 accounts with those of three years ago and those estimated for three years ahead. Another way to view the short-range outlook is to compare the annual expenditure (expressed as a percentage of the national taxable payroll) with the payroll tax rate. This is done for the same three years in Table 2. Persons accustomed to dealing with figures smaller than those involved in social security may sometimes attach too little significance to an excess of 0.72 per cent as shown for the intermediate 1978 estimate. That difference in 1978 dollars is $6.5 billion.

The fragility of even short-range forecasts can be illustrated by tracing,

TABLE 1

SHORT-RANGE FINANCIAL CONDITION OF EACH TRUST FUND

(By Calendar Year; Figures in Billions)

Fund	Income			Disbursements			Fund at End of Year		
	1972	1975	Est. 1978	1972	1975	Est. 1978	1972	1975	Est. 1978
OASI	$40.0	$59.6	$80.6	$38.5	$60.4	$83.6	$35.3	$37.0	$29.3*
DI	5.6	8.0	11.0	4.8	8.8	13.3	7.5	7.4	1.6*
HI (medicare, Part A)	6.4	13.0	21.0	6.5	11.6	18.8	2.9	10.5	12.9*
SMI (medicare, Part B)	2.8	4.7	8.2	2.6	4.7	7.9	0.6	1.4	2.7

* 1978 figures shown for these three accounts are based on the intermediate among three sets of assumptions that were employed. The ranges of fund balances from the optimistic through intermediate to pessimistic assumptions are shown below:

Fund	Optimistic	Intermediate	Pessimistic
OASI (Note 1)	$30.1	$29.3	$26.6
DI (Note 2)	1.7	1.6	1.2
HI	13.4	12.9	12.0

NOTE 1.—The OASI fund would remain positive for several years beyond 1981 under the optimistic and the intermediate assumptions but would be exhausted during 1981 under the pessimistic assumptions.

NOTE 2.—The DI fund will become exhausted during 1979 under any of the three assumptions.

in Table 3, the changes in successive estimates of income, disbursements, and fund balances for the year 1976 in the last four trustees' reports.

ASSUMPTIONS—LONG-RANGE OUTLOOK (OASDI)

For most actuaries engaged in product design or in valuation of liabilities for long-range insurance and pension contracts, the information of greatest value in these reports is the array of assumptions that the authorities consider reasonable for valuing benefits payable in the distant future. The practice, examined and approved by the Advisory Council on Social Security in vari-

TABLE 2

COMPARISON BETWEEN (1) ANNUAL EXPENDITURE AS PERCENTAGE OF TAXABLE PAYROLL AND (2) COMBINED EMPLOYER-EMPLOYEE TAX RATE

(By Calendar Year)

FUND	1972		1975		EST. 1978	
	(1) Expen-diture	(2) Tax	(1) Expen-diture	(2) Tax	(1) Expen-diture	(2) Tax
OASI	8.13%	8.1%	9.29%	8.75%	9.28%	8.7%
DI	1.01	1.1	1.36	1.15	1.47	1.2
HI	1.26	1.2	1.73	1.8	2.07	2.2
Total	10.40%	10.3%	12.38%	11.7 %	12.82%*	12.1%

* The figures in this column are calculated on the intermediate assumptions already mentioned. On the optimistic assumptions the expenditure rate would be 12.67%; on the pessimistic, it would be 13.14%.

TABLE 3

ESTIMATES FOR CALENDAR YEAR 1976

(In Billions of Dollars)

Report	Income	Disbursements	Net Increase in Trust Fund	Trust Fund December 31, 1976
OASI:				
1973	62.6	58.9	3.6	47.0
1974	67.0–67.8	66.4–67.5	0.6–0.3	37.4–37.3
1975	63.8	68.1	−4.3	31.3
1976	65.1	67.9	−2.7	34.3
DI:				
1973	8.2	8.0	0.2	8.6
1974	9.0–9.1	9.2–9.4	−0.2 to −0.3	7.7
1975	8.6	10.1	−1.5	5.8
1976	8.7	10.3	−1.6	5.8

ous years, is to look ahead seventy-five years in these analyses, that is, to the year 2050.

One has only to imagine a group of actuaries in the year 1901 faced with forecasting economic and demographic trends up to 1976 to appreciate the impossibility of the project. But it is a mistake to suppose that because such predictions are beyond human ability efforts of this sort are a waste of time. Even though the results no doubt will amuse future generations looking back, the attempt achieves in some degree several useful purposes. It reveals otherwise far from obvious characteristics of benefit formulas; it can give insights into relationships among benefits for different groups and successive generations; and it can curb congressional temptations to make rash benefit promises without even trying to legislate the tax rates necessary to pay for them.

The most fundamental assumption, and a safe one, employed in the 1976 OASDI report is that the benefit structure now in effect *will* be changed. The report says:

> Because of the complex and apparently unintentional way in which future benefits are related to future changes in wages and the Consumer Price Index, the benefits under present law projected to materialize under certain assumptions regarding such changes reach unreasonably high levels for persons who first become entitled to benefits in the next century. Historically, legislative action has been taken to bring projected future income and disbursements from the trust funds into balance, and it is clearly imperative that legislative changes be made to prevent these projected levels from materializing.

The conviction that this reviewer believes to be widespread is that unreasonably high benefits will emerge long before the next century unless wise congressional action is taken; hence stronger wording than that just quoted seems justified. Part of the citizens' educational effort sponsored by the Academy Committee on Social Insurance is aimed toward drawing attention to the need for prompt action by Congress.

In the following tables are exhibited the major economic and demographic assumptions used in the report for the short-range as well as the long-range forecasts.

Wage and Price Increase Assumptions

Practice at the Social Security Administration is to average the wage patterns for men and women in most analytical work. To this reviewer it seems more prudent and useful to keep figures for men and women separate; not only are the levels quite different, but even the slopes and shapes of the earnings curves are dissimilar. Furthermore, the outlook surely is for material changes in relationships between earnings of women and those of men.

Table 4 shows the existing and assumed annual rates of increase in average wages and in the consumer price index. Alternatives I, II, and III cover the range from what the authors of the report consider low to high future increase rates. Table 5 gives for comparison historical rates derived by this reviewer from published data.

Real wage growth, defined as here, has generally been higher than 2 per cent per year since World War II, except in highly inflationary 1968–73. The expectation of the report is that in the life span of those who are now children real wage growth is more likely to be below than above 2 per cent per year. The interested reader can find contrasting views on this critical economic question in Robert J. Myers' textbook (*Social Security* [Homewood, Ill.: Richard

TABLE 4

PERCENTAGE INCREASE OVER PRECEDING YEAR

Alternative	1974 Actual	1975 Preliminary	1978	1981	1982–2050
	A. National Average Wage				
I	6.5%	6.8%	9.6%	6.8%	5.25%
II	6.5	6.8	9.4	6.7	5.75
III	6.5	6.8	8.9	6.6	6.25
	B. Consumer Price Index				
I	11.0%	9.1%	5.5%	4.0%	3.0 %
II	11.0	9.1	6.0	4.5	4.0
III	11.0	9.1	6.5	5.0	5.0
	C. Approximate Real Wage Growth (A minus B)				
I	−4.5%	−2.3%	4.1%	2.8%	2.25%
II	−4.5	−2.3	3.4	2.2	1.75
III	−4.5	−2.3	2.4	1.6	1.25

TABLE 5

HISTORICAL PERCENTAGE INCREASES, AVERAGED OVER FIVE-YEAR PERIODS

	1948–53	1953–58	1958–63	1963–68	1968–73
A. Wages	5.5%	3.6%	3.4%	4.9%	6.1%
B. CPI	2.2	1.5	1.2	2.6	5.0
C. A minus B	3.3%	2.1%	2.2%	2.3%	1.1%

D. Irwin, Inc., for the McCahan Foundation, 1975], pp. 169–73); in A. M. Niessen's review of the 1974 reports (*TSA*, XXVI, 651–52); and in the February, 1975, Report of the Panel on Social Security Financing (pp. 26–28).

Fertility

The function displayed is the total number of children a woman will have during her entire childbearing period if the birth rates applicable age by age in the year indicated remain unchanged.

It has become widely understood that fertility is extraordinarily difficult to predict. However, this reviewer is unenthusiastic about the report's comment in its Appendix A that "the choice of a suitable lower limit . . . is facilitated somewhat by the fact that such limit must be somewhat greater than zero. On the other hand, the upper limit is much less predictable." The function in question has been in sustained and rapid decline; the major problem seems to be to predict where and when the decline will cease and whether the subsequent movement will tend to be level or upward.

TABLE 6

FERTILITY RATES—HISTORICAL, CURRENT, AND ASSUMED

Year	Rate	Year	Rate
1950	3.0	1975	1.8*
1955	3.5	1977	1.75
1960	3.6	Ultimate:	
1965	2.9	Alt. I	2.3
1970	2.4	Alt. II	1.9
1973	1.9	Alt. III	1.7

* Preliminary figure.

The figures in Table 6 show some history, as well as the rates used in the report. Probably few can feel comfortable with the same range of assumptions. It is food for thought that the report supports the idea that the fertility rate in this country may not decline far below its present level, is more likely to trend upward than downward after 1977, and, one might say by odds of 2 to 1, will not get as high as the zero-growth level (2.1) during the entire era up to mid-twenty-first century.

Mortality

The report says that it has been assumed that "through 2050 mortality rates will continue to follow the general trends established over the period 1950–1973," resulting in about a 15 per cent mortality reduction by the end of the seventy-five years. It is mentioned that mortality at the very young ages and at ages over 55 is projected to improve relatively more than at in-between ages. Actuaries, and no doubt others, would welcome clearer description of the forecast, particularly between mortality trends in the two age brackets within in which changes have materially different consequences for social security costs. Display of age-adjusted mortality trends for each sex separately in the age groups (below age 20, ages 20–64, and age 65 and above) might nicely answer such a need.

United States Population

Appendix Table A of the report gives a valuable picture of this country's future population as it would emerge from each of the three alternative fertility patterns, from the mortality assumption, and from an assumed level annual immigration of 400,000 people. This reviewer thinks the table would have been improved if the writers had shown the actual current population from which they started; he obtained what he assumes is the starting array (shown in Table 7) by consulting SSA Actuarial Study No. 72.

Differences in fertility assumptions—the only element of difference among these alternatives—result in large differences in numbers of children, even as soon as the turn of the century. If one defines the total dependency ratio of the sums for age groups under 20 and over age 64 to the numbers in the presumed labor force ages 20–64, that ratio, now 83 per cent, is forecast as being between 62 and 72 per cent in the year 2000, rising later to somewhere between 74 and 80 per cent by 2050. Throughout the seventy-five-year period our total population continues to grow under the conditions of Alternative I, is essentially level between 2015 and 2050 under Alternative II, but under Alternative III declines after about 2020, so that by 2050 it is only 15 million higher than it is today.

Population Covered under Social Security

The covered population is the total population modified by the labor force participation rate and also by an element that is assuming enlarged importance these days, the rate at which state and local government employees exercise their option to withdraw from the system. The labor force participation rate is assumed to decrease slightly from the present level for men but to increase sharply for women, resulting in an ultimate participation for women about 73 per cent of that for men.

The official attitude toward the unemployment rate is that it will decline under any of the three alternatives, as indicated in Table 8.

None of the figures in the report takes any account of the effect of future terminations of coverage that may result from notices filed or pending from state and local government groups. Even if notice has already been filed, such groups may still revoke it. This cooling-off period is an opportunity for actuaries to urge and help local authorities and their employees to understand,

TABLE 7

UNITED STATES POPULATION BY AGE GROUPS
(Millions of People)

Alternative	1975	1990	2000	2010	2050
	Ages under 20				
I	78	75	83	86	109
II	78	71	72	70	68
III	78	69	67	62	52
	Ages 20–64				
I	122	148	158	171	200
II	122	148	158	167	156
III	122	148	157	165	137
	Ages 65 and Over				
I	23	29	30	33	51
II	23	29	30	33	50
III	23	29	30	33	49
	All Ages				
I	223	252	271	289	360
II	223	247	260	270	274
III	223	245	255	260	238

TABLE 8

ASSUMED AVERAGE ANNUAL UNEMPLOYMENT RATE

Alternative	1975	1978	1981	Ultimate Rate	Year when Ultimate Rate Is Reached
I	8.5%	6.3%	4.5%	4.5%	1981
II	8.5	6.6	5.2	5.0	1982
III	8.5	7.6	7.4	5.5	1989

more clearly and accurately than many of them now do, the implications of their decision and the mistake they may be about to make. The trustees' report a year ago was the first one to report more than 100 million contributors to the system. There were still more than 100 million this past year, but there soon may not be if the total is reduced by persisting unemployment and by the withdrawals already discussed.

Disability

In terms of imminence of exhaustion of its trust fund, urgency of action is greater for the DI account than for any of the others. This urgency arises also because the ominous prospect of a continuing rise in disability incidence rates, combined with a declining claim termination experience, is heightened by the claim administration procedures in SSA, by the definition of what constitutes compensable disability in the law, and by the unreasonably large benefits thrown up by the present benefit structure for people whose coverage period is short.

John H. Miller, F.S.A., has been assisting the government to decide what should be done to remedy the disability problem. Interested actuaries are directed to Mr. Miller's discussions of this subject in his *Disability Newsletter,* particularly to the figures and recommended reading in the June, 1976, issue. Also, there is an excellent analysis of the problem and its possible solutions by Mr. A. Haeworth Robertson, F.S.A., in *RSA,* I (No. 4), 768–75. It need only be noted here that, although the problem is already severe, the assumption in the trustees' report is that the experience will deteriorate further, to the tune of 33 per cent, before there is hope for leveling off.

Financial Effect of These Assumptions

The report faces the problem of what to display by way of long-range OASDI costs, without obscuring the need and expectation for changes in the present benefit structure, by giving two sets of long-range costs. One of these sets shows what would happen if Congress were to fail to make some changes; the other displays the financial consequences of changing to what is called a "modified theoretical system," which would maintain through time the present relationship, that is, that existing at the beginning of 1978, between average awarded benefits and average earnings. (This reviewer perceives this as being not identical with the latest Advisory Council's wage-indexing recommendation —which has been espoused by President Ford—but as being a close cousin of it.) Table 9 shows the two sets of benefit costs displayed in the report, while Table 10 shows the payroll tax rates provided for under present law and also under President Ford's recommendation to Congress.

Comment earlier in this review about the potency of what appear to be modest differences between costs and tax rates is worth reiterating. These figures make abundantly clear the imperative need for prompt abandonment of the untenable benefit promises of present law; the need could be emphasized even more dramatically by displaying the expenditure percentages for other economic assumptions beyond the range of Alternative III but within the bounds of possibility. The figures show with equal clarity that the modified system, if it were to be adopted, would have to be accompanied by provision for much higher tax rates than those in the president's financing proposal. The text of the president's proposal reveals to the careful reader a fact that many may fail to grasp—that it goes only far enough to remedy the short-range discrepancy between taxes and expenditures.

TABLE 9

AVERAGE OASDI EXPENDITURES AS PERCENTAGES OF TAXABLE PAYROLL

	1976–2000	2001–25	2026–50
Alternative I:			
Present law	10.9%	13.8%	16.7%
Modified system	11.1	13.7	16.0
Alternative II:			
Present law	11.8	18.0	27.0
Modified system	11.6	14.9	19.3
Alternative III:			
Present law	12.8	22.8	40.8
Modified system	12.1	15.9	21.9

TABLE 10

COMBINED EMPLOYER AND EMPLOYEE PAYROLL TAX RATES

	1977–2010	After 2010
Present law	9.9%	11.9%
President's proposal	10.5	12.5

THE TRUSTEES' FOUR PRINCIPAL RECOMMENDATIONS

The recommendations that conclude the OASDI report are the following:

1. That prompt action be taken to strengthen the financing over the near term by increasing the tax rates.
2. That general revenue financing be avoided.
3. That increases in the maximum taxable earnings base be limited to the normal increases tied to increases in average wages. (This is a reversal, without comment, of the trustees' favorable attitude toward special increases a year ago.)
4. That additional plans to strengthen the long-range financing be given high priority.

The trustees professed themselves "in full concurrence with the intent of the 1975 Advisory Council . . . that the benefit structure be revised in a responsible manner," and they recommend adoption of "a specific plan" as soon as possible. This reviewer, believing that the relative merits of wage-indexing and price-indexing alternatives need to be widely and thoroughly discussed, hopes that he correctly interprets that wording as holding the door open for such discussions.

Mr. A. Haeworth Robertson (whose first reports these are since he became chief actuary of SSA) and his admirable colleagues in the Office of the Actuary have done themselves proud in these reports. They are especially to be congratulated upon the informal commentary that accompanies the reports and for the following statement about the broad implications of the era into which the world seems to have entered: "In some cases the assumptions produce results so different from the current situation that attention should be directed toward [their] overall implications. . . . For example, . . . if the population composition should change in accordance with these assumptions, it is likely to result in substantial changes in many of the nation's social and economic arrangements."

THE MEDICARE REPORTS

Part A (HI)

Under HI this year's estimates point to a much more serious deterioration in the twenty-five-year outlook than was forecast even as recently as a year ago. Quoting the current report, "After 1985, the trust fund is projected to decline steadily, until it is completely exhausted in the early 1990's." The trouble is attributed to "assumed continuation of increases in the cost of institutional health care at a higher rate than increases in taxable earnings."

Table 11 compares the estimated expenditures in the current and the last two reports (excluding amounts needed to raise the HI fund to its goal of covering one year's outgo), expressed as percentages of taxable payroll. Since the payroll tax rate, now 1.8 per cent for employer and employee combined, is

TABLE 11

EXPENDITURES OF HOSPITAL INSURANCE PROGRAM AS PERCENTAGE OF TAXABLE PAYROLL

(Estimated on Intermediate Assumptions)

Estimated in:	1975	1980	1985	1990	1995	2000
1974 report. .	1.57%	1.97%	2.41%	2.86%	3.35%	†
1975 report. .	1.73	2.06	2.60	3.10	3.58	†
1976 report. .	1.73*	2.26	2.82	3.54	4.27	4.93%

* Actual figure.

† Since HI projections are prepared for 25 years, figures for the year 2000 were not available from the 1974 and 1975 reports.

now scheduled to rise only to 3 per cent before leveling off in 1986, it appears that citizen unrest about the burden of social security taxes is likely to be heightened by the medicare component.

Of special interest to actuaries who are concerned with predicting hospital costs is Table A1 on page 23 of the HI report, setting forth the views of the Office of the Actuary on the speed of growth of inpatient hospital costs. These costs, which in recent years have been growing in aggregate at somewhat less than a 15 per cent rate from one year to the next, are expected to grow more rapidly than 15 per cent per year in the next few years; a growth rate below 10 per cent per year is not expected until after 1985.

Part B (SMI)

Under SMI none of the financing comes from payroll taxes. Enrollment is voluntary but close to universal among those eligible, and costs are covered by income from monthly premiums paid by those enrolled, government contributions from general revenues, and interest. The participants' premium, originally \$3.00 a month before April, 1968, was increased in July, 1976, from \$6.70 to \$7.20 monthly. Since the participants' premium cannot legally be raised faster than the level of OASI cash benefit is raised, that is, faster currently than the rise in the consumer price index, and, since costs of physicians' services are expected to continue rising more rapidly than the CPI, the outlook is for major increases in contributions from general revenues. The following comparison is excerpted from Table 6 of the SMI report (amounts shown are millions of dollars):

	Premiums from Participants	Government Contributions
July, 1974—June, 1975 (actual)....	1,887	2,395
July, 1975—June, 1976 (projected)..	1,921	2,908
July, 1976—June, 1977 (projected)..	2,112	4,597

The report wisely emphasizes the need for taking into account benefits incurred but unpaid as well as benefit disbursements in appraising the sufficiency of the trust fund.

As with the other reports, actuaries in search of data and ideas should be sure to turn to the descriptions of methodology and assumptions in Appendix B of this report.

E. J. MOORHEAD

William C. Greenough and Francis P. King, *Pension Plans and Public Policy*, pp. 311, Columbia University Press, New York, 1976, \$15.00.

Messrs. Greenough and King bring a wealth of experience from their years at TIAA-CREF to this most lucid discussion of the relationships between public policy, social security, and private and public pension plans.

The book may be divided neatly into three main sections. The first five chapters are descriptive in nature, dealing with the history and current characteristics of public and private pension plans in the United States. The second section focuses on three important areas requiring public policy decisions—vesting, financing, and income objectives. It is in these chapters that elements of controversy arise and the authors make some specific recommendations for the future. Finally, the book finishes with an interesting overview of pension systems in a number of foreign countries.

Within the descriptive section, this reviewer found of greatest interest the subjects related to social security and pension plan investments. The financing problems of social security are quite well known by now, and both the short-run problems (primarily the coupling of benefit increases for retired and active workers) and the long-run problems (primarily demographic) are clearly described. The authors come out for decoupling, for great restraint on enlarging future commitments, and against the use of general revenue to finance social security. Clearly the authors believe social security should play no greater part in the overall pension structure than it does currently—an opinion with which most insurance company and consulting actuaries are very likely to agree.

The discussion on pension investments focuses first on the question of whether pension plans tend to increase or decrease total public savings. The evidence is conflicting on this point. What is clear is that the tremendous asset growth of the private, state, and local pension plan sectors is not going to abate soon. By 1981, projections indicate a total pool of funds approaching half a trillion dollars. The authors expect these assets to be more greatly diversified than they are now, with more use of direct placement bonds, mortgages, and real estate. Other trends that might have been given greater emphasis include the high interest guarantee contracts offered by insurance companies, pooled real estate accounts, and the increasing interest in a more systematic approach to relating the investment needs of a pension plan to its particular circumstances. Finally, the authors expect various categories of funds to become more similar in their investment strategy than they are today.

The authors devote a full chapter to the subject of vesting, making a strong case for a long-term goal of full immediate vesting—except for newer pension plans. While it may be difficult to argue with the social desirability of immediate—or at least very early—vesting, there are questions of costs and priorities that might have been more fully developed in the book.

The authors are considerably more circumspect in their discussion of objectives for retirement age and benefit levels. They warn against any possible trend toward a normal retirement age of less than age 65, citing enormous economic and social implications. The reviewer strongly agrees with this warning; in fact, in the long run the normal retirement age may well have to move up.

The book identifies inflation as the key problem for the retired person. The authors cite as one of the best (though by no means perfect) solutions to the problem to be a combination of fixed and variable annuities, with the latter depending on common stock returns. As they point out, however, recent history has demonstrated clearly that the short-term synchronization of inflation rates and common stock returns can be lacking in the extreme.

The chapter that is perhaps the most striking in this excellent book deals with the financing (or, more accurately, the lack of financing) of public pension plans. While many have become aware of the social security financing problems, only recently has the extent of state and municipal financing problems become evident. Even less well known are the huge and growing liabilities being developed by the civil service retirement system and the armed services pension system. When all these elements of the public pension scene are viewed together, it becomes clear that the combination of excessively generous plan provisions and insufficient or no funding is not a viable situation in the long run.

Recognizing this, the authors develop an admirable set of recommendations, ranging from the elimination of overly generous early retirement provisions to funding requirements similar to those of private plans, and including the highest standards of actuarial valuation, accounting, and disclosure. Of course, the real question is whether such sensible reforms can survive the political process.

Books like *Pension Plans and Public Policy* represent one of the best methods of making large segments of society aware of the knotty problems and social policy questions inherent in the current United States pension structure. Messrs. Greenough and King's highly readable book is a valuable contribution to the professional and interested layman alike.

STEPHEN L. BROWN

Report of the Consultant Panel on Social Security to the United States Congressional Research Service, pp. vi, 120, U.S. Government Printing Office, Washington, D.C., August, 1976, $1.90.

This report contains the results of another government-initiated study of the OASDI system. This study puts forth a second solution to a problem first publicly identified by the 1975 Advisory Council on Social Security (a problem that has come to be known as the "decoupling" issue). Because the solution proposed by the actuaries and economists making up this consultant panel is significantly different from that of the Advisory Council, this report has inspired some degree of friendly debate among actuaries and others interested in the technicalities of the OASDI benefit formula. Panel members are

Peter A. Diamond, James C. Hickman, Ernest J. Moorhead, and William C. Hsiao (Chairman).

The *Reports of the Quadrennial Advisory Council on Social Security,* published in March, 1975, and reviewed in the 1975 *Transactions,* include an extremely important recommendation. To correct what the Advisory Council considered to be a serious flaw in the OASDI benefit structure (operating under the so-called automatic provisions incorporated into the Social Security Act by the 1972 amendments), the council proposed a set of benefit formula changes. These would isolate the benefits for those not yet beneficiaries from the consumer price index adjustments for those already on the beneficiary rolls —hence the "decoupling" terminology. The purpose of these proposed changes is to stabilize replacement ratios by the elimination of what has come to be recognized as an overindexing of the worker's potential benefit.

As compared with those who write summaries of publications, those who write reviews are not expected to be entirely objective with respect to the work under review; but they are expected to state their biases. It is therefore incumbent upon this reviewer to acknowledge that he was one of a five-member group of consultants to the 1975 Advisory Council and is clearly associated with the solution proposed by the council. Since the four-man panel responsible for this new report can be viewed as challenging the conclusions of the Advisory Council's consultants, this reviewer's objectivity may be suspect. He admits to continuing to hold his original views as to the superiority of the Advisory Council approach, but he considers this new report to have merit and to be worthy of the attention of any actuary interested enough to delve into an extremely interesting analytical problem.

In form the two competing proposals are much alike. Both would index benefits for those on the beneficiary rolls as under current law. Both would introduce the principle that the social security wage records are also to be indexed before they are averaged, thus replacing the AMW (average monthly wage) in current law by the AMIE (average monthly indexed earnings). Both would replace the complicated multistep formula now defining the PIA (primary insurance amount) in terms of average wages with a simpler two- or three-step formula. In both cases this formula would be designed to fit as closely as possible the PIA's for those becoming beneficiaries on or near the effective date of change. In both cases the breakpoints in the formula would be dynamic, being themselves indexed. Moreover, both approaches would leave unchanged the slowly lengthening averaging period, the five-year dropout, and the other details of what earnings are taken into the calculation of average earnings. Both would maintain the present "automatic" procedure for keeping the taxable wage base current.

The technical differences are largely concentrated in the indexing of the wage records (for the calculation of the AMIE) and in the indexing of the breakpoints (for the calculation of the PIA). The Advisory Council would base the indexing of both these quantities on "average earnings in covered employment," consistent with the indexing of the taxable earnings base but different from the CPI indexing of benefits for those already beneficiaries. The consultants (hereinafter called the "Hsiao panel") submitting this new report base the indexing of both quantities on the CPI, consistent with the indexing of benefits for those on the beneficiary rolls but different from the indexing of the taxable earnings base.

The differences therefore involve the handling of any gap between wage change and price change, which difference may be called the "gain in real earnings." The Advisory Council indexes the potential benefits for those still working to include gain in real wages, while the Hsiao panel does not. In the likely situation where gain in real earnings is positive, the Advisory Council approach means that potential benefits go up with average earnings levels and replacement ratios are essentially preserved. In similar circumstances the Hsiao panel approach preserves the purchasing power of benefits but permits replacement ratios to decline. Benefits under either system start with where present law leaves them when the necessary legislation becomes effective, but PIA's would be expected to increase faster in dollar terms under the Advisory Council system than under the Hsiao panel formula. Either would prevent the increase in replacement ratios that is the likely result of current law.

The above somewhat simplified statement of the differences between the two recommendations is not sufficient to judge their relative merits. Concentration on the details of the benefit formula leads into the technical consideration of the relative merits of wage versus price indexing, but this is not where the basic issues really lie. This becomes apparent when it is noted that indexing of wage records is not a necessary feature of either system. The earliest forms of the Advisory Council's stabilized replacement ratio formula included breakpoint indexing but no wage record indexing, and the Hsiao panel objective of slowly declining replacement ratios can be achieved by other means as well (including the decoupling of the present system without further change). The real differences between the Hsiao panel and the Advisory Council approaches lie in differences in philosophy as to which of the problems of the system can best be solved today and which are better left to the future.

The Advisory Council approach is early enactment of their decoupled formula, thus putting the system on a track that leads to neither a shrinking nor an expanding system. The long-range deficit will thereby be improved (but in no way eliminated), so the next order of business becomes the decisions as to what other measures can best solve the system's short- and long-range financing problems.

The Hsiao panel concept is somewhat more subtle. It too would get the system off of its current expansionary track, but the Hsiao panel would go further, reversing the direction and putting the system in the direction of declining replacement ratios leading to a shrinking system. The long-range actuarial deficit might be largely eliminated by the assumption (backed by the automatic provisions in the new legislation) that replacement ratios would decline, since under the economic assumptions now employed by the SSA the decline in replacement ratios could largely offset the adverse demographic factors that are expected to hit the system around the turn of the century.

The subtle (but not really secret) part of the Hsiao panel approach is that the panel does not really expect the system to shrink—in fact they no more favor a contracting system than does the Advisory Council. Their approach is therefore that of a "semiautomatic" system, always on a track leading downward but jacked up periodically by further legislative action accompanied by appropriate additional financing. In the long run the benefits and the financing of the system might look not much different from those under the Advisory Council approach, but the system would have come to that point by a "more conservative" indexing framework now considered only semiautomatic, modified upward by occasional ad hoc adjustments.

So the issue is joined. The Hsiao report suggests that the Advisory Council approach overcommits the future by actions taken in the present. They would prefer to "promise less" and leave more of the decision to the future. Advocates of the Advisory Council prefer not to rely on the rationality of future decision-making in such a difficult area, fear that advocacy for a contracting system may well fail and thus result in no change at all, are dubious that replacement ratio declines can be corrected by general benefit increases without unsatisfactory side effects, and consider the actuarial projections under the Hsiao approach to be needlessly dependent upon the relationships between future wage and price changes.

By concentrating on what he considers the main thrust of this report, this reviewer has simply not done justice to other recommendations in the report, nor has he mentioned much useful information to be found there. The reader can get a broader view of the Hsiao panel proposals by reading the summary appearing in the September, 1976, issue of *The Actuary*.

The actuarial profession and the public at large are indebted to the Hsiao panel for a prodigious effort and a well-thought-out report. Even if the panel's proposals eventually lose out to the earlier proposals of the Advisory Council (as seems to this reviewer the likely result), actuaries and others interested in the success of the OASDI system should have gained a better understanding of its dynamic nature.

C. L. TROWBRIDGE

Donn B. Parker, *Crime by Computer*, pp. 308, Charles Scribner's Sons, New York, $10.95.

If you have from time to time become concerned about the security of computer programs, records, and transactions, this book will give little comfort. While its emphasis is perhaps aimed at entertainment, the citations of actual cases and the somewhat detailed accounts of methods used by perpetrators of computer crimes will at least provide you with food for thought and perhaps persuade you to take a look at your own computer security. Methods in which the computer's own operating system was used to the advantage of the criminal are intriguing and alarming.

Although not strictly a computer crime, the Equity Funding operation is also described by the author.

ROBERT J. JOHANSEN

Reports of Consultants on Actuarial and Definitional Aspects of Social Security Disability Insurance, pp. 176, U.S. Government Printing Office, Washington, D.C., 1976.

This publication presents the report of three consultants to the Subcommittee on Social Security of the House Committee on Ways and Means, along with a copy of a proposed draft of HEW regulations regarding the use of nonmedical factors in determining disability. All of this material is concerned with the disability portion of the Social Security Act and, more specifically, with certain aspects of the definition of disability and the increases in benefit utilization that are taking place under this disability program.

The proposed regulations regarding the use of vocational factors in the disability determination process is a formalization of current operating instructions. They involve a detailed classification of age, education, and work experience and define the level of each that, in conjunction with the various levels of medical impairment, produces a finding of disabled or not disabled. For example, one limited by medical impairment to sedentary work, age 55 or over with limited education (seventh through eleventh grade) and skilled or semiskilled work experience that is not transferable to other occupations, is defined as disabled.

The report by Edwin Yourman, formerly the assistant general counsel, Social Security Administration, is entitled "Feasibility of a More Objective Test for Disability under the Social Security Act." Here Mr. Yourman discusses the pros and cons attendant on the current and proposed rules for disability determination; recommends that consideration be given to the establishment of two or more levels of severity of impairment along with the vocational classification of individuals; and discusses making rules such as those proposed the sole criteria for establishing disability, with less involvement in the subjective determination of whether or not the claimant can do some jobs. Such a step would tend to create more consistent treatment of the claimants and reduce the adjudication level that currently exists.

The report by John Miller, past president of the Society of Actuaries, covers the reasons for the escalation in disability costs and related matters. Mr. Miller holds that the level of benefits provided in relation to earnings (replacement ratio) is considerably more important than disability definitions in determining the cost of any program. He presents statistical support of this position along with the July, 1975, social security replacement ratios, which show the high benefits provided, especially at the younger ages. Mr. Miller suggests the adoption of a more rational benefit formula along with making rehabilitation the primary objective of the program in order to control costs and maximize the value of the program in terms of quality of life and human dignity. Mr. Miller discussed the possibility of more direct administrative control by having local offices report directly to the national headquarters (as opposed to the current state intermediary) in order to maximize fiscal control and equity in the treatment of all claimants. Finally, Mr. Miller suggests the expansion of the actuarial analysis of the disability experience in order to measure administrative quality, measure experience trends through an "early warning system," and analyze demographic experience characteristics to shed light on disability as an aid in improving the program. The use of the Anderson expected exposure method is discussed in this regard.

William Roemmich, M.D., chief medical director of the Bureau of Disability Insurance, reports on the use of medical factors as against vocational factors in the determination of disability process. While judgment cannot be avoided entirely, he feels that appropriate application of medical standards alone can produce uniform nationwide disability decisions that adequately measure inability to work "by reason of medically determined impairment." He feels that the use of vocational factors in disability determination has shifted the definition of disability toward "inability to engage in usual work by reason of age, education and work experience provided any impairment is present." He quotes statistics that show that 36 per cent of applicants meet the medical criteria while 55 per cent are allowed benefits. The use of vocational factors in determining disability in the cases not meeting the medical criteria has increased the disparity in benefit award decisions and the number of cases being appealed and reversed. Dr. Roemmich also discusses the problems and shortcomings in the proposed rules regarding the use of vocational factors.

ROBERT B. SHAPLAND

Warren Shore, *Social Security: The Fraud in Your Future,* pp. 238, Macmillan Co., New York, 1975, $7.95.

Warren Shore dislikes social security operated by the United States government. He doubts that people whose earnings are subjected to the payroll tax can safely count upon the government to redeem its promises of future benefits, citing as one cause of doubt President Ford's 1975 request that Congress grant less than the full scheduled cost-of-living increase. He is deeply suspicious of a system that does not build the same reserves that are required of life insurance companies; he quotes, without identifying time, place, or context, what seems an extraordinary remark by former New York

Superintendent of Insurance Benjamin R. Schenck equating life insurance company fiscal inadequacy with a reserve less than 10 per cent of life insurance in force.

Warren Shore objects to official descriptions of the system that seem to him at variance with its true character—for example, an official statement that "contributions . . . are pooled in special trust funds." He discourages people from regarding social security as insurance and the taxes as contributions.

He believes that governmental coverage with private life insurance is both inefficient and irrational. He says you could do at least twice as well for yourself outside the system, and he categorizes the present financial difficulties with the words, "Social security's administrators have bet our reserves and lost. Now they must hope we won't notice."

Therefore, Warren Shore has devised a plan for gradually phasing out social security run by the government, replacing it by a system entrusted to the private life insurance industry. His must surely be among the most poorly documented of any proposals for remedying the system's financial woes; his entire "New Generation Compact" is set forth in only eleven pages containing no tables or dollar forecasts whatsoever. The reader is expected to have faith in two sentences (p. 134) that read, "But the 'match-up' chosen . . . has been carefully selected and studied. There is profit potential (for the life insurance companies) in the plan."

The author's New Generation Compact calls for giving the major capital accumulation industries a chance to offer a package of life, retirement, and disability insurance to those about to enter the job market. The new young workers could elect either the present law or the private offer. For each young worker who chose the private route the insurers would be obliged, beginning one year later, to pay benefits to one newly retiring worker. The notion is that, while admittedly this requirement is burdensome, it is temporary, and even on today's individual life insurance the companies expect to lose money "until the sixth or seventh year of premium payment." An added feature is that within limits the worker could elect the coverage he considers that he needs most—for example, relatively more retirement accumulation and less death protection for the single or childless worker.

Readers who look for closely reasoned analysis and for conclusions expressed in measured terms will not find them here. Furthermore, the text is laced with errors and half-truths; Robert J. Myers needed more than nine single-spaced typed pages just to point them out. The Social Security Administration promptly issued a response (November 20, 1975), which should be read by anybody seriously interested in the book, as should reviews of the book in *Business Week* (December 8, 1975) and the *New York Times Book Review* (November 16, 1975). Actuaries may find it interesting to estimate what the response of their own companies would be if the New Generation Compact were officially offered them.

The book undertakes to provide information (in a section entitled "A Survivor's Manual") about individual retirement accounts, the present social security provisions, and how to decide how much life insurance one should purchase and from what companies.

E. J. MOORHEAD

1972 Lifetime Earnings by Age, Sex, Race, and Education Level, pp. 12, Research and Statistics Note No. 14, Social Security Administration, Washington, D.C., 1975.

This note presents detailed data by quinquennial age groups, sex, race, and years of school completed as to the present value of future earnings based on static earnings levels (1972). It is stated that such data can be used for general analytical purposes to form policy, for court determinations of awards in damage suits, and for cost-benefit analyses in such areas as disease prevention and education programs.

The mortality used is that of the United States 1972 Abridged Life Tables, issued by the National Center for Health Statistics. Labor force participation rates are based on 1970 data from the Current Population Survey of the Bureau of the Census. The combination of these two elements, of course, gives the effect of a work life table such as those prepared by the United States Department of Labor from time to time (see A. M. Niessen's review of the latest such table in the November, 1971, issue of *The Actuary*).

The earnings assumptions are based on 1972 data from the Current Population Survey plus, for females only, the estimated market value of housewives' services. One could well argue that some allowance for presumed income for housekeeping might be made for men at the older ages when they cease gainful employment outside the home and then are retired at home.

Alternative interest discount rates of 2, 4, 6, and 8 per cent were used. As an actuary who has had considerable education and experience in the field of economics, I was both surprised and appalled to see this inconsistent combination of static salaries with interest rates that are in some cases tenable only under dynamic conditions. Based on past economic trends and on likely future ones, it would seem that a static salary scale would imply an interest rate of no more than 2 per cent, and possibly as low as 1 per cent. Conversely, an interest rate of 8 per cent would imply that salaries would be dynamically increasing at an annual rate of 6–7 per cent.

To put it another way, the real inflationless interest rate can reasonably be taken as 3 per cent. Then, as a result of productivity changes, salaries would increase at a rate of perhaps 1 per cent per year and no more than 2 per cent per year. Combining these elements, we then arrive at a differential of only 1–2 per cent between the interest rate and the salary increase rate. Accordingly, discount rates of 4 per cent or more when used with a static salary scale are completely inconsistent. It is to be noted that this same type of economic consideration enters into valuation of pension plans that are on a final salary basis and also into the benefit stability and financial status of the social security system as its automatic-adjustment provisions now apply.

As to the actuarial aspects of the data in the note, reference is made to a publication of the United States Department of Health, Education, and Welfare for the methodology (Dorothy P. Rice, *Estimating the Cost of Illness*, Health Economic Series No. 6, 1966). Although the general methodology used for this relatively simple actuarial problem follows accepted actuarial principles, a number of minor technical errors or inappropriate approximations occurred that could just as readily have been avoided. For example, the present values of lifetime earnings were obtained by grouping the data quinquennially and then using the midpoints of each group. It would have been more accurate to use single-age values, even though this would entail more work. The present value of a series of increasing annual payments beginning two and a half years from now and running for five years is by no means exactly the same as 5 times the average annual payment discounted for five years.

The Rice report also makes an interesting attempt to obtain the loss to the economy in the form of earnings (including housekeeping "earnings") as a result of deaths in 1963. What is done is simply to multiply the deaths at each age by the present value of the discounted earnings. This arithmetical exercise is fallacious unless it is the case (which it obviously is not) that all persons who died in a particular year were in exactly the same health condition just prior to death as were those who did not die in the year. Such would be the case only for deaths due to accidents or certain communicable diseases. It does seem anomalous to compute the economic loss for deaths in a year when there is involved the probability (in the present values of discounted earnings) that they may die in the next year or subsequently.

ROBERT J. MYERS

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—"Health Insurance"; 4—"Social Insurance."

ACTUARIAL AND OTHER MATHEMATICS, STATISTICS, GRADUATION

U.S. National Center for Health Statistics, *United States Life Tables: 1969–71*, pp. 29, U.S. Decennial Life Tables for 1969–71, Vol. 1, No. 1, May, 1975, U.S. Department of Health, Education, and Welfare, Rockville, Md., $0.85.

This publication presents the most current tables in the series of United States decennial life tables that are based on the United States censuses and on registered deaths during the three-year period surrounding the year of the particular census.

It presents twelve life tables, showing all combinations of four color categories (total, white, other than white, and Negro) and three sex categories (total, male, and female). It also includes a short discussion by Dr. T. N. E. Greville of types of life tables, data sources and characteristics, and measures of comparative longevity.

This publication is the first of a series of reports on 1969–71 decennial life table programs.

U.S. Bureau of the Census, *Projections of the Population of the United States: 1975–2050*, Current Population Reports, Series P-25, No. 601; Washington, D.C., October, 1975. Noted in *The Actuary*, March, 1976.

This report gives long-range population estimates of considerable interest to those concerned with social security and private pension plans. Three main projections series are presented. All three use the same assumptions as to migration and as to mortality (basing the last on work done by the Office of the Actuary, Social Security Administration). The difference in the projections is the assumed future rate of fertility. Series I assumes a rate higher than the replacement level, Series II assumes a rate exactly equal to the replacement level, and Series III assumes a rate lower than the replacement level.

U.S. National Center for Health Statistics, *Comparability of Mortality Statistics for the Seventh and Eighth Revisions of the International Classification of Diseases, United States*, pp. 93, Data Evaluation and Methods Research, Series 2, No. 66, Rockville, Md., October, 1975.

It has been the practice since 1900 to revise the International Classification of Diseases every ten years to keep abreast of medical knowledge. Each decennial revision has produced breaks in the comparability of cause-of-death statistics. The degree of discontinuity resulting from the introduction of the eighth revision, used beginning with data year 1968, has been considerable for a number of causes of death. An adequate presentation of mortality trends without reference to these discontinuities is impossible.

Each of the fifteen leading causes of death (and the major component diseases therein) are analyzed for the effects of the eighth revision on the statistical results.

Life Insurance and Annuities

Robert A. Marshall and Eli A. Zubay, *The Debit System of Marketing Life and Health Insurance*, pp. 152, Prentice-Hall, Inc., Englewood Cliffs, N.J., $15.95.

Published for the Educational Foundation, Inc., which is part of the School of Business Administration of Georgia State University, this book was commissioned from the Center for Insurance Research (at Georgia State) by the Life Insurers Conference, an association of companies using (in varying degree) the home service (née "debit") system.

The book is written for a specialized audience, most of whom will be very familiar with the operation of the debit system. It includes a history of debit insurance, descriptions of debit accounting and debit underwriting, and discussion of marketing environment.

Health Insurance

The National Center for Health Statistics publishes "Vital and Health Statistics," which consists of several series of reports, some of the more recently published of which may be of interest to actuaries. Several are digested below. To be placed on the mailing list for items in the series, write to:

National Center for Health Statistics
U.S. Public Health Service
HEW Building South
Washington, D.C. 20025

U.S. National Center for Health Statistics, *Health Interview Survey Procedure—1957–1974*, pp. 153, Programs and Collection Procedures, Series 1, No. 11, Rockville, Md., April, 1975.

The Health Interview Survey, one of a variety of programs conducted by the National Center for Health Statistics to gather information on the health of the American people, has been in operation since July, 1957. The survey consists of a continuous sampling and interviewing of the civilian, noninstitutional population of the United States.

In addition to the collection of information and the production of health statistics, research studies relating to survey methodology and improved techniques in data collection have been carried out since the beginning of the survey. As a result of these studies and of the experience gained in the collection process, many changes have occurred in the format, content, and administration of the questionnaire, the collection document used in the survey.

This report outlines the changes that have led to the improvement of data collection in the household survey since its inception. The expansion of the survey is also examined to provide for the gathering of information on supplemental health-related topics.

U.S. National Center for Health Statistics, *A Study of the Effect of Remuneration upon Response in the Health and Nutrition Examination Survey—United States*, pp. 23, Data Evaluation and Methods Research, Series 2, No. 67, Rockville, Md., October, 1975.

This report describes the design and results of an experiment to test whether a $10.00 payment to participate in the National Health and Nutrition Examination Survey would significantly increase the response rate for the survey.

U.S. National Center for Health Statistics, *Quality Control in the Hospital Discharge Survey*, pp. 41, Data Evaluation and Methods Research, Series 2, No. 68, Rockville, Md., December, 1975.

This report contains a detailed description of the quality control, process control, and editing techniques employed in the National Center for Health Statistics continuing Hospital Discharge Survey.

U.S. National Center for Health Statistics, *The Analytical Potential of NCHS Data for Health Care Systems—a Report of the United States National Committee on Vital and Health Statistics*, pp. 26, Documents and Committee Reports, Series 4, No. 17, Rockville, Md., September, 1975.

At their October 19–20, 1972, meeting, the U.S. National Committee on Vital and Health Statistics established a technical consulting panel charged with investigating ways in which the analytical potential of data produced by the National Center for Health Statistics could be more fully realized. The panel was organized in the spring of 1973 and held its first meeting September 17, 1973.

Following a brief account of background factors related to the charges given to this panel, the report deals with four main topics: users, their information needs, specific recommendations, and conclusions.

U.S. National Center for Health Statistics, *Persons with Impaired Hearing, United States—1971*, pp. 43, Data from the National Health Survey, Series 10, No. 101, Rockville, Md., November, 1975.

Estimates of the number of hearing-impaired persons by degree of hearing loss and age of onset, distributed by age, sex, place of residence and geographic region, size of family, limitation of activity, telephone in household, family income, years of completed education, color, living arrangements, and usual activity. Based on data collected in household interviews during 1971.

U.S. National Center for Health Statistics, *Acute Conditions Incidence and Associated Disability, United States, July 1973–June 1974*, pp. 69, Data from the National Health Survey, Series 10, No. 102, Rockville, Md., October, 1975.

Statistics on the incidence of acute conditions and the associated days of restricted activity, bed disability, and time lost from work and school, by age, sex, calendar quarter, place of residence, and geographic region. Based on data collected in household interviews during the period July, 1973–June, 1974.

U.S. National Center for Health Statistics, *Family Out-of-Pocket Health Expenses, United States—1970*, pp. 61, Data from the National Health Survey, Series 10, No. 103, Rockville, Md., December, 1975.

Statistics on the annual out-of-pocket health expenses of families and unrelated individuals, by type of expense, type of family unit, proportion of family units with no expense, and intervals of expense. Total family-unit expenses are distributed by color and family income. Based on data collected by self-enumeration or personal interview during 1971.

U.S. National Center for Health Statistics, *Persons Injured and Disability Days by Detailed Type and Class of Accident, United States—1971–1972*, pp. 54, Data from the National Health Survey, Series 10, No. 105, Rockville, Md., January, 1976.

Statistics on the incidence of persons injured and associated disability days by detailed type and class of accident, place of accident, and selected demographic characteristics. Based on data collected in health interviews during 1971 and 1972.

U.S. National Center for Health Statistics, *Inpatient Utilization of Short-Stay Hospitals by Diagnosis, United States—1972*, pp. 66, Data from the National Health Survey, Series 13, No. 20, Rockville, Md., November, 1975.

Statistics are presented on the utilization of nonfederal short-stay hospitals, based on data abstracted by the Hospital Discharge Survey from a national sample of hospital records of discharged inpatients. The number of discharges, discharge rates, and average length of stay are shown for the classes and categories of first-listed diagnoses, by demographic characteristics of inpatients discharged and by geographic region and bed size of the hospitals. For these patient and hospital characteristics, this report also presents the number and percentage distribution of all listed diagnoses (up to five diagnoses per patient) reported for inpatients discharged.

U.S. National Center for Health Statistics, *Selected Operating and Financial Characteristics of Nursing Homes, United States: 1973–74 National Nursing Home Survey*, pp. 66, Data from the National Health Survey, Series 13, No. 22, Rockville, Md., December, 1975.

Statistics are presented on the major operating and financial characteristics of nursing homes, based on data collected in the 1973–74 National Nursing Home Survey. Data are reported by type of ownership, certification status, size of home, and geographic region.

U.S. National Center for Health Statistics, *Selected Vital and Health Statistics in Poverty and Nonpoverty Areas of 19 Large Cities, United States, 1969–71,* pp. 63, Data from the National Vital Statistics System, Series 21, No. 26, Rockville, Md., November, 1975.

A descriptive and analytical study of differentials in selected vital and health statistics measures associated with residence in poverty and nonpoverty areas within nineteen of the largest cities in the United States for the years 1969–71. Discusses characteristics of births (including birth weight, legitimacy status, prenatal care, and educational attainment of the mother), infant and fetal mortality, and deaths due to tuberculosis and to violent causes. Race or ethnic group is used as a control variable in the analysis.

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