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BOOK REVIEWS AND NOTICES*

*D. M. McGill, *Fundamentals of Private Pensions*, 2d Edition, pp. xv, 421, Richard D. Irwin, Inc., Homewood, Ill., 1964.

The growth of interest in and concern about the social and economic implications of the private pension movement is evidenced by the studies recently published by the Pension Research Council of the University of Pennsylvania.[1] Another volume in this series, evaluating the influence of actuarial decisions on the security of pension expectations, is also expected.

The past decade has also seen the publication by the Council of Dorrance C. Bronson's *Concepts of Actuarial Soundness in Pension Plans* (1957)[2] and Joseph J. Melone's *Collectively Bargained Multi-employer Pension Plans* (1963). Other publishers have offered Hamilton and Bronson's textbook, *Pensions* (1958);[3] Father Paul Harbrecht's *Pension Plans and Economic Power* (1959);[4] and, most recently, Merton C. Bernstein's *The Future of Private Pensions* (1964).

This array of new pension material might lead some pension experts to question whether there is a demand for another pension "primer." To the reader who attempts the new detailed studies without previous knowledge of the pension field, the need for a new edition of *Fundamentals of Private Pensions* is obvious.

The second edition follows in general outline the format of the original volume, but the text has been expanded from five chapters (239 pages) to nine chapters (421 pages). In part, this expansion is a reflection of the fundamental changes that have occurred in the operation of the private pension institution since the first edition was written a decade ago: new benefit forms have been introduced and old ones elaborated; new types of funding instruments have been developed; techniques of pension-fund investing have been refined; tax structures have been refined and new tax rulings issued; and new terminology has evolved. Appendixes to the second edition include as new material illustrations of the documents the pension-plan administrator may encounter: a specimen pension plan and trust agreement and examples of each of the major forms of

* Books and other publications noted with an asterisk (*) may be borrowed from the library of the Society of Actuaries under the rules stated in the *Year Book*.

[1] Reviews of these studies have appeared in the *Transactions: Legal Protection of Private Pension Expectations* by Professor E. W. Patterson, in *TSA*, XIII, 45; *Legal Status of Employee Benefit Rights under Private Pension Plans* by Professor B. Aaron, in *TSA*, XIII, 652; *Decision and Influence Processes in Private Pension Plans* by Professor J. E. McNutty, Jr., in *TSA*, XIV, 182; *Fulfilling Pension Expectations* by Professor D. M. McGill, in *TSA*, XIV, 539.

[2] Reviewed in *TSA*, X, 121.

[3] Reviewed in *TSA*, XI, 281.

[4] Reviewed in *TSA*, XII, 196.

group annuity contract—deferred annuity, deposit administration, immediate participation guarantee, and the separate account.

The book is introduced by a chapter surveying such forces underlying the pension movement as the economic basis of the old age problem, public pension programs, and the forces influencing the growth of private pension plans.

A new chapter entitled "Functions Associated with Private Pension Plans" outlines the activities involved in establishing a pension program in the broad categories of selling the plan, developing the terms of the plan, choosing the funding agency, installing the plan, and operating the plan. This chapter provides a smooth and logical transition from the broad economic survey of the first chapter to the more detailed examination of the pension planning functions which follow in succeeding chapters.

Two chapters entitled "Basic Features of a Pension Plan" are devoted to the scope of coverage of a pension plan, its primary retirement benefit structure, other plan features such as benefits on withdrawal, death or disability, source of contributions, limitations on the employer's commitment, and the effect of plan termination.

The author then discusses types of funding instruments in two chapters, one covering "Allocated Funding Instruments" and the other "Unallocated and Combination Funding Instruments." This useful separation, replacing the distinction made in the first edition by "plan types" and "funding media," highlights the flexibility available today under insured plans. Special attention is given to the newly developed separate account contracts which offer the employer who wants it an opportunity to increase his participation in equity investments under an insurance company contract.

A chapter, "Quantitative Measurement of Pension Obligations," describes in general terms the factors of mortality, interest, withdrawal, disability, and retirement which enter into the measurement of pension obligations. The author draws a distinction, easily overlooked by the pension novice, between actuarial liabilities used to measure the value of accrued pension credits or as a guide for the funding program of the employer and the legal liabilities of the employer to provide the benefits spelled out in his pension plan.

The discussion of "actuarial cost methods" employs the definition of this term adopted by the Committee on Pension and Profit-sharing Terminology as a "particular technique for establishing the amount and incidence of the annual actuarial cost accrued for plan benefits, or benefits and expenses, and the related actuarial liability." The author points out that this definition emphasizes the measurement of cost as opposed to the setting-aside of funds to meet those costs. Although the new terminology recommended by the Committee and used by the author does have many advantages in measuring pension obligations, it also has some disadvantages at least initially. Internal Revenue Service rules are still expressed in terms of the earlier terminology, and readers having to work with IRS regulations will require greater detail and precision in the definition of the formerly used terms than is provided in the text.

In introducing the chapter "Approaches To Meeting Financial Obligations of

a Pension Plan," the author again points out the function of an actuarial cost method is "to apprise the employer of the rate at which the obligations under the plan are accruing to the end that appropriate financial arrangements may be made to meet such obligations." He then describes the various approaches that may be utilized to meet the obligations of a pension plan as they are so measured. This careful distinction between the *measurement* of the obligation and the steps taken to fund it adds greatly to the value of this book and should do much to clear up misconceptions.

In the chapter entitled "Choice of Funding Instrument" the author offers an orderly sequence of decisions to be made in implementing a decision to install a funded pension plan. A general discussion of the major factors which have a bearing on the choice of funding instrument is presented under four broad headings—cost, security of benefits, flexibility, and service.

After an extensive review of items affecting net financial outlay—mortality, investment earnings, expenses, withdrawal rates, compensation levels, retirement rates, and employee contributions—the author concludes that only two elements of the cost, investment earnings and expenses, are affected in the long run by the choice of funding instrument. He points out that the choice of funding instrument will, however, have an effect on the *incidence* of costs.

Security of benefits is measured in terms of a third-party guarantee, a segregated pension fund committed to the payment of pension benefits, and the general financial resources and good faith of the employer.

The importance of flexibility in a pension plan is considered from the points of view of benefit structure, funding policy, investment policy, and in relationship to the facility with which a change in funding agencies can be accomplished.

The author points out that, although the service factor does not lend itself to precise delineation, it generally embraces those functions associated with the installation of the plan, periodic valuations, disbursements of pension monies, and routine record-keeping. He points out that it is very difficult even to generalize in this area, using as an example actuarial services provided by various consulting actuarial firms which may range from those which greatly surpass those provided by an insurance company under typical circumstances to those which do not approach even the minimum standard of an insurance company. With respect to the disbursement functions, he concludes that insurance companies enjoy a very definite advantage because of their superior facilities for keeping track of persons who have retired or who have left the service of the employer with purchased deferred benefits.

In the second edition of *Fundamentals of Private Pensions*, as in the first, Dr. McGill has performed an outstanding service to pension students by putting into perspective the issues which confront an employer considering the establishment and operation of a pension plan. In doing so, he has not hesitated to grasp the nettle of the controversy between the relative merits of the insured and the uninsured approaches to pension funding. It is a measure of his success that proponents of either school may feel that at certain points of the text the author does not give full credit to the virtues of that approach or adequate recognition

of the deficiencies of the alternate approach. With respect to insured plans, the author devotes entire sections of the text to a discussion of changes that have occurred in the past decade: investment-year methods; separate accounts, changes in the federal income-tax law as they affect insured pension reserves, and the actuarial services that are offered by insurance companies in the modern pension market.

This book has value for the pension expert as well as the student, serving not only as a convenient refresher course but as a sourcebook for approaches and language for explaining difficult pension concepts.

EDWARD A. GREEN

The first edition, written ten years ago, won the Elizur Wright Award of the American Risk and Insurance Association. Both editions have been published as a part of a series for the Pension Research Council, Wharton School of Finance and Insurance, University of Pennsylvania. The first edition was the initial publication for this series and was followed by nine other publications dealing with other specialized studies. A twofold purpose of the book was (1) to provide background for these other more specialized studies and (2) to serve as a basic text or reference book. Difficult concepts are discussed more fully than in the first edition. The second edition includes one hundred more pages of text material and appendixes illustrating different forms of documents implementing a pension plan.

A description is given of the contracts and arrangements for funding pension obligations. One chapter is devoted to "Allocated Funding Instruments," with descriptions of individual policies, group permanent policies, and group annuities on the traditional single-payment basis; another chapter then treats "Unallocated and Combination Funding Instruments," with descriptions of deposit administration group annuities, trust funds, and split-funding (partly trust funded and partly insured) arrangements.

Of special interest to actuaries is a schematic classification of actuarial cost methods. This classification depends on whether the benefits valued are (1) those accrued to the date of the valuation or (2) those projected to retirement. When benefits are projected to retirement, an individual approach (with or without the supplemental liability) or an aggregate approach (again with or without the supplemental liability) may be used, and this distinction is a part of the classification. Furthermore, this classification uses the terminology and concepts developed by the Committee on Pension and Profit-sharing Terminology which functions under the joint auspices of the Pension Research Council and the Commission on Insurance Terminology. For example, the first classification on funding relates to the method by which costs are based on benefits directly related to periods of service, known as the "unit cost," "unit credit," "step-rate," or "single-premium" method. On the other hand, the second classification on funding that depends on projected benefits may be the individual level cost without a supplemental liability (i.e., such as the level premium of an individual retirement income policy) or with a supplemental liability (frequently known as

"entry age normal"). Also, this second classification includes the aggregate level-cost method, the method having been known variously as the "entry age normal" or "attained age normal" where a supplemental liability is involved. The traditional "entry-age-normal" technique has, of course, been utilized frequently on an individual basis or on a group (i.e., aggregate) basis, and this method of classification would make the distinction.

A separate chapter deals with the financial policy of the employer in meeting the pension obligation. This may range all the way from meeting the obligations simply as they arise (i.e., pay-as-you-go, which does not involve advance funding and so was not classified as an actuarial cost method) to following one of the advance funding methods which have been classified. Reference is made to various actuarial assumptions (mortality, interest, expense, withdrawals, salary increase, retirement age) used for the cost examples given, but these assumptions are also covered much more completely in an earlier chapter on the "Quantitative Measurement of Pension Obligation" and in a following chapter in relation to the "Choice of Funding Instrument."

With respect to the "Choice of Funding Instrument," comparisons are made between investment income and expenses of the insured and trust-funded approach. Statements are made about the security of benefits that tend to favor the insured approach, which involves allocated funding, but statements are also made about flexibility that tend to favor the insured unallocated approach or the trust-fund approach. The author's concluding statements balance (1) flexibility and control of the benefits and their funding with (2) the freedom from such responsibilities enjoyed by the insurance of the benefits. But I wonder if we can purchase freedom from responsibility in this pension-plan area, even from an insurance company.

WILLIAM W. FELLERS

*American Federation of Labor and Congress of Industrial Organizations, *Pension Plans under Collective Bargaining: A Reference Guide for Trade Unions*, pp. x, 131, Washington, D.C. (undated).

This booklet replaces one with the same title last revised about ten years ago. As might be expected from the time elapsed, the current booklet is quite different from the one it replaces. Primary credit for preparation of the booklet is given to Richard E. Shoemaker, of the AFL-CIO's Department of Social Security, but the booklet shows the effects of many contributors and editors. Among the acknowledged participants are Howard Young and John P. Jones, both members of the Society.

The booklet contains eleven chapters. The first seven provide an introduction to the design and financing of a pension plan. Chapter viii is a statement of the "Pension Goals" of the AFL-CIO—this statement has received some publicity. Chapters ix, x, and xi deal mainly with the mysteries of actuarial valuations of pension plans. Actuaries working in the pension field will undoubtedly encounter persons attempting to make use of the tables appearing in these chapters.

The general approach favored by the booklet seems to be to bargain for benefits rather than for a specific contribution. Inevitably, this leads to arguments over what the benefits are going to cost the employer and what the level of funding should be. This approach requires more knowledge on the part of the bargaining agent than does the fixed-contribution approach, where other parties set the plan benefits.

The discussion of the laws pertaining to pension plans gives prominence to the Federal Disclosure Act. It is quite clear that the reporting required of employers is considered a valuable source of information, useful in bargaining, that might otherwise be difficult to obtain.

In the discussion of the merits of various pension benefit formulas and other plan provisions, the point is made that, while a benefit related to service but not to earnings is more in keeping with union tradition, upward trends in the cost and standard of living make a formula that reflects earnings as well as service more desirable in the long run. A consistent position for fixed-contribution situations is that the "fixed" element should be a percentage of payroll rather than a number of cents per hour. (A possible decline in the number of hours worked per year is another argument for this point of view.) There is a related discussion of how to protect the retired person from a gradual decline in his relative purchasing power. The preferred way is to have the employer commit himself to post-retirement cost-of-living adjustments. The possible use of variable annuities where such a commitment cannot be obtained is mentioned.

One section in the discussion of plan provisions pertains to the election of options. It contains the following sentences about the contingent annuitant option:

> Experience has shown that unless the option can be exercised at the time of application for retirement, it has little meaning. An irrevocable election required to be made long in advance results in very few workers exercising the option. Regardless, therefore, of the possible cost impact on the plan, which is slight in any case, the joint and survivor option should be open until actual retirement.

Considering that this is coupled with a desire for freedom in the election of when to retire and liberal early-retirement benefits, the cost impact could be more than "slight" unless the plan already provides a pre-retirement widows' benefit.

As part of the discussion of multiemployer plans, the "portability" of pension benefits is discussed. The conclusion reached is that, "while, in theory, it would be possible to make payments into a centralized fund based on the service of short-term employees and pay a pension based on these contributions, this would require a central administrative control of policies and procedures which could best be accomplished under the social security system." This is followed by urging that "unions should not, therefore, let preoccupation with private pensions deter their efforts from the long-term objective of improving the federal social security system." There is no evidence in this discussion of acceptance of the view that the union is strengthened when its bargaining produces the important part of its members' retirement income. Recent bargaining results suggest such a view is accepted by the UAW.

The discussion of insurance company contracts and of banks versus insurance companies will cause some pain to the insurance-company-oriented reader. Compared with banks, which are apparently deemed to be nonprofit operations and to support social insurance, the insurance companies are not so highly regarded. The possible social advantage to be achieved through directing pension funds into suitable investments is mentioned. One wonders how seriously to take such a statement.

The expense of obtaining actuarial assistance is discussed. It is indicated that such assistance can be obtained (free) through an insurance company. Also that "some banks and trust companies in the business of administering pension funds also offer consulting services." It is recommended that an "independent actuary" be hired, perhaps jointly with the employer. However, consultants regarded as employer-oriented should be avoided, according to the guide.

There is considerable space devoted to how to proceed if an insurance company is to be used. Some of the discussion of bids, costs, and retentions is appropriate for health and welfare benefits but *not* for pensions and will confuse many readers. Also, insurance company guarantees are deemed of no value, and any reserves the companies establish because of such guarantees are an unnecessary part of the "retention." Apparently, most weight should be given to recent past investment performance as reflected in experience crediting and other elements of the experience-rating process, with emphasis on estimated expense charges.

There is hearty indorsement of advance funding of the pension plan but mixed feelings about liquidating the past-service liability. A long amortization period means higher benefits for a given employer contribution but less safety if the employer goes out of business. Somewhat irrelevantly, mention is made that the social security program is actuarially sound "because future costs have been recognized and provision has been made to meet these costs." But "through increased taxes" is not added.

The chapters on actuarial matters will be heavy going for most bargaining representatives. The word "cost" is used in several senses, one being the amount the employer decides to contribute under a certain program of amortization of the past-service liability. In order to aid understanding, a few liberties are taken. For example, it is said that, if the plan provides for vesting, no turnover should be used in the service table beyond the point of vesting. This is appropriate on the unit-credit method but not for the entry-age-normal method being illustrated.

Chapter ix concludes with a table which shows the approximate contribution per person for a plan providing $1.00 per month per year of service for a given average age and average years of service. It gives the bargaining agent a reasonable basis for determining, before detailed calculations are available, the relationship between pension benefits and the contributions required to fund them. Also, it aids him in arguing with the employer's actuary. Chapter x contains tables of adjustment factors which are applicable to the contribution per person to reflect benefit variations. There is a discussion of the effect of using different mortality tables. The 1951 Group Annuity Table with a one-year setback in age

is thought to be "adequately conservative at the present time" for cost estimate purposes. Revenue Ruling 63-11 is apparently the basis for this judgment.

Any actuary whose work brings him close to collective-bargaining situations should read this booklet.

RAYMOND W. BENDER

M. Pilch and V. Wood, *New Trends in Pensions*, pp. 223, Hutchinson & Co., Ltd., London, 1964.

This book describes the practices among private pension plans in Great Britain, based on a survey of 180 companies conducted by the authors. While the survey is admittedly limited in scope, it is submitted by the authors as evidence of possible trends in the field of pensions. The text goes far beyond merely stating the results of the survey in terms of the various aspects of pension planning, such as benefits, contributions, and funding methods. With characteristic British thoroughness, the theories behind each type of provision involved in pension planning are carefully examined. As a result, the book makes a good text for reference in its field.

It is interesting to note that, despite a few outstanding differences between pension planning in the United States and Great Britain, such as the latter's preponderance of contributory plans, most of the problems encountered in both countries stem from the same fundamental principles. For example, cost estimates in connection with funding of private plans in Great Britain are frequently made without relating them to an adequate description of the details of the plan or the assumptions and methods of funding involved. In addition to factual material on general aspects of pension plans, there is also specific information on some of the large British plans. The final section of the book contains brief descriptions of the principal features of the national insurance schemes of about twenty other countries.

J. B. GARDINER

H. G. Fraine, *Valuation of Securities Holdings of Life Insurance Companies*, pp. xiv, 255, Richard D. Irwin, Inc., Homewood, Ill., 1962.

Dr. Fraine's book is not recommended for light summer reading, nor does an adequate reviewing of it constitute an easy task. Nevertheless, the book is something of real value to the life insurance industry, partly because one is forced to the conclusion that the valuation process now employed is unjustifiably complicated and that further complications should be firmly resisted. Rather we should try to move in the direction of much greater simplification.

The book begins with a record of the evolution of current method of valuing securities by American life insurance companies. The second chapter sets forth the available facts regarding loss experience on bonds, mainly corporate issues. This chapter details the more important findings of the Corporate Bond Study of the National Bureau of Economic Research and also the depression experience of life insurance companies. From it one is forced to conclude that there is

no worthwhile statistical basis for building up a mortality experience for bonds in any way akin to the mortality experience on lives. Therefore, in building up a loss reserve to cover future bond losses, one is steering blindly to a large extent, and any degree of attempted refinement in this area is unjustified.

The chapter on loss experience on preferred stocks sets forth the conclusion that swings in their value are largely due to money-market changes. The author concludes that the loss experience on preferred stocks, other than that arising from money-market fluctuations, has not been greater than that on bonds. This is in substantial part because the bulk of such preferred issues are relatively high-grade securities of public utilities.

Possibly the most controversial part of this book has to do with common stocks. The author correctly stresses the very wide cyclical swings in common-stock prices but points out that over the years 1918–60 the year-end values of the Standard & Poor's Price Index of five hundred common stocks trended upward at an average rate of 3.84 per cent a year. In view of this long-term upward trend in stock prices, which he points out has been well supported by dividend increases, it is rather surprising that he recommends that life insurance companies carry their common stocks at cost. In support of this proposal he makes the following statement, which, to this reviewer, opens the door to a good deal of potential controversy:

> There it may be noticed not only that dividend flow has been more stable than the movement of market values, but also that the increase in dividend receipts was at least as great as the rise in aggregate market value of holdings. This indicates that as far as common stocks are concerned, equity among succeeding generations of policyholders can be preserved through the realization of income, and for such a purpose the writing up of values above cost may amount to double counting: the introduction of income from anticipations as well as from realizations.

Is there not some confusion here between earnings statements and balance sheets, dividends belonging in the former and stock values in the latter? Also the author appears to fail to take into account the fact that the stock owner, unlike the bondholder or preferred-stock owner, receives only part of his reward in dividends paid, and the balance through capital appreciation which is a normal expectation from the plow-back of earnings into the business rather than for payment in dividends. The carrying of common stocks indefinitely at cost, regardless of market quotations, would seem to fail to recognize the fundamental nature of securities of this type and their basic difference from fixed-income investments.

The author points out weaknesses in the present system of valuation. He says that this system is far too complicated, with which conclusion this reviewer thoroughly agrees. Contributions to the Mandatory Securities Valuation Reserve are probably inadequate in the light of loss experience. Because of the minimum-balance requirement, this reserve is not fully available to meet losses, which is the purpose for which it is accumulated. He concludes that both the annual reserve accumulation and the maximum reserve requirement on bonds of investment quality are only one-quarter to one-half of a level which might be

required in future depressions. Except for market fluctuations due to changes in interest rates, the loss experience on preferred stocks has been as good as on bonds. Therefore, a loss-reserve accumulation on such stocks at the rate of 1 per cent per annum is excessive in the opinion of the author. With this conclusion, the reviewer also agrees.

Probably of maximum interest to the life insurance industry are the changes proposed by the author in the present valuation and reserve system. He proposes to divide all securities into just two classes: fixed-income securities and variable-income securities. Briefly, the fixed-income securities class would include all bonds and preferred stocks not in default as to interest, dividends, or principal. The variable-income securities class would include all others. Securities in both classes would have a statement value of cost.

It is in the area of loss-reserve accumulations that the author seems to get into deep water and to become unduly complicated. He proposes that reserves be accumulated against losses on corporate bonds and preferred stocks on a basis which would vary with the earnings coverage of interest and preferred dividends; the lower such coverage, the higher would be the rate of reserve accumulation. Carrying out such a proposal would provide a statistician's field day. For municipal revenue bonds, he proposes that the rate of loss-reserve accumulation be increased in proportion to the degree by which the market yield on such bonds exceeds that on United States Treasury bonds of equal maturity. To base a quality rating of a bond on a single statistic is, in the opinion of this reviewer, unrealistic. Because of their tax exemption, all but the most risky municipal bonds usually yield less than United States Treasury bonds of equal maturity.

The author proposes that the minimum loss-reserve required to be on hand at all times should be equal to the excess of statement values over the market values of variable-income securities. This would provide a reserve-liability item sufficient to offset the amount by which common stocks and bonds and preferred stocks in default as to interest and preferred dividends are carried above their market value.

Altogether, the author has done a very useful and painstaking job of exposing to careful analysis the weaknesses and inconsistencies of the present system of security valuation and loss-reserve accumulation. However, some of the remedies which he suggests are, in the opinion of this reviewer, of somewhat questionable merit and might even complicate the disease which it is proposed to cure.

This book was not meant to cover the subject of mortgage loans, which currently are carried at cost and against which no loss reserve is required to be set up. This reviewer would point out that such treatment of mortgage loans is quite inconsistent with that currently accorded bonds and preferred stocks. Why go into great refinement with respect to the valuation and loss reserving of bonds and preferred stocks while treating mortgage loans in the present fashion?

F. J. McDiarmid

**Report of the Commission on the Cost of Medical Care*, Vol. I: *General Report*, pp. ix, 182; Vol. II: *Professional Review Mechanisms*, pp. x, 62; Vol. III: *Significant Medical Advances*, pp. ix, 96; Vol. IV: *Changing Patterns of Hospital Care*, pp. vii, 173, American Medical Association, Chicago, 1964.

Recognizing the public's concern with the rising costs of medical care, the trustees of the American Medical Association in 1960 authorized a commission to examine factors affecting medical care costs and the availability of medical services. The Commission's studies, conducted over a three-and-a-half-year period, drew on previously published reports, formal research projects, and discussions with various consultants. The results, presented in this four-volume report, are intended as a "contribution to a better understanding of medical care prices and expenditures."

Various aspects of medical economics are examined in Volume I of the Commission's report. A theoretical analysis of the market of the medical care "industry" is contained in one chapter. The discussion of selected components of supply and demand makes it apparent that the medical care market is not one of perfect competition. For example, the services offered by physicians are not identical; and ethics of the profession impose limitations which are not characteristic of a free market. The prices charged by hospitals do not respond to fluctuations in demand, unlike prices which are subject to the discipline of the market place, and consumers of medical care lack the complete knowledge of available alternative supplies which is assumed in the model of pure competition.

The market for medical care is marked not only by imperfect competition but by a high degree of price inelasticity—that is, the quantities demanded or supplied are relatively insensitive to price changes. The report states that this is true of the demand for most components of medical care, and it is also true, in the short run, of the output of medical goods and services. However, the report goes on to say that in the long run the inelastic demand "has been balanced by a reasonably elastic long-term supply function." It might have been pointed out that, when the public believes market forces are not sufficiently strong to bring about a desired increase in supply, public funds are allocated to stimulate, for example, the training of manpower and the construction of additional health facilities.

The Commission also essayed a study to measure the effect of different variables which influence the demand for medical care. The method used was that of multiple-regression analysis. Measures of several economic variables (e.g., family income and price of medical care) and sociodemographic variables (e.g., health status of the family and educational level) were correlated with measures of demand.

It was found, not surprisingly, that family income is significant in determining demand for both medical care and health insurance. Insurance coverage, in turn, was shown to be an important determinant of demand for hospital care. According to the analysis, price does not significantly affect demand for health services.

The study's findings are subject to several limitations. Existing data, collected by the Health Information Foundation and the National Opinion Research Center in a 1958 survey of family medical care expenditures, were used. Not only was this information several years old, but, having been collected for a different purpose, it did not wholly fit the needs of the present study. Consequently, the interest of this study lies not so much in its results as in the method it presents to explain and predict variations in expenditures for different components of medical care.

A chapter devoted to the medical care price index contains a clear and thorough discussion of the procedures employed by the United States Bureau of Labor Statistics in calculating the medical care component of the Consumer Price Index. Steps taken in the 1964 revision of the Index to correct earlier shortcomings are described.

The Commission charges that the CPI still does not accurately measure medical care price changes because it does not take into account the changes in the quality of medical care. As a result, it is claimed, the CPI overstates the true rise in medical care prices.

Descriptions of twelve programs organized by the medical profession to attempt to insure the continuing success of voluntary health insurance and other prepayment mechanisms are contained in Volume II of the Commission's report.

These programs are of three general types. The first is the foundation for medical care. Such organizations, found principally in California, are established by county medical societies. The foundations offer sponsorship to any underwriter who agrees to provide health insurance which meets basic standards set by the foundation and who further agrees to delegate claims-review functions to the foundation. All claims review is performed by physicians. Sponsorship implies that all physicians having agreements with the foundation will accept as payment in full the fees listed in the foundation's maximum fee schedule.

Because the foundation is completely responsible for claims review and payment, the underwriter has only a minimum amount of information in his records. Another drawback, from the standpoint of the insurer, noted in the Commission's description of three foundations is the fact that the basic standards set by the foundations are not uniform and that each contract written to allow for these variations must be filed with the insurance commissioner.

Medical service bureaus in the state of Washington are a second type of organization set up by the medical profession. There are twenty-two of these medical society–approved prepayment plans. Three are described in the report. These bureaus generally cover physician services in full, with free choice of physician. Coverage for hospital care is also available. Like the foundations for medical care, the medical service bureaus administer all claims of insured members. The service bureaus, however, are actually the indemnifiers, while the foundations act as administrators for insurance carriers.

Review programs which operate as committees of medical societies are the third type of structure studied. Unlike the foundations and service bureaus, these committees usually review only those claims which have been referred to

them by a health insurer. Their activities are generally advisory in nature, aimed at resolving differences between physicians and insurance carriers on the basis of reasonable, usual, and customary charges. The report states: "The review programs were established by the medical societies to provide objective, professional advice, on request, to health insurance carriers, prepayment plans and others concerning fees and procedures which appear unusual." The report further notes that "the health insurance industry has encouraged the formation of review mechanisms within medical societies and has assisted substantially in their formation." In 1962, seventeen state medical associations and fifty local medical societies had such committees. The report describes six of these, which illustrate some of the procedural variations among these bodies. The medical society review committee, whose formation is a relatively new development, is hailed by the Commission as "a constructive program of self-discipline by the medical profession which seeks to secure the wisest possible use of voluntary health insurance and prepayment plans."

Volume III surveys significant medical advances that have occurred during the quarter century 1936–62. Samples of twenty qualified physicians in each of the specialty areas of medicine and in general practice were surveyed. They were asked to name significant advances within their own area of practice. The criterion used was as follows: "A significant advance is one which medical practitioners would least like to do without in their own practice of medicine." This criterion is flexible, permitting the individual physician to establish his own standards.

The Pharmaceutical Manufacturers Association, representing manufacturers of prescription products, supplied a new list of single chemical entity drugs introduced in the United States between 1941 and 1962. The AMA's Department of Drugs compiled a similar list of products for the period 1935–41 and assisted in developing a survey, the results of which were consolidated into a list of the thirty pharmaceuticals mentioned most frequently in responses from 304 consultants.

The Commission also developed an outline to be used in determining whether an advance considered significant from a medical viewpoint could also be considered important from an economic point of view. Its analysis of the economic significance of specific medical advances sought to determine the medical implications, the impact on mortality and morbidity trends, and the economic benefits of these medical advances. The economic effects of medical advances are only infrequently clearly definable. In the interplay of multitudes of factors, affecting both mortality or morbidity and economic loss or gain, they are most frequently extremely difficult to ascertain.

Five specific areas were selected for a detailed analysis: (1) the development of the polio vaccines; (2) the early detection of uterine cancer; (3) the surgical correction of congenital heart defects; (4) the introduction of antituberculosis drugs; and (5) the evolution and use of disposable products.

Most people are acquainted with the significant decreases that have occurred in the incidence of polio since the introduction of the Salk vaccine. Relatively

few people are aware of how greatly the economic contribution that has resulted from this advance exceeds the research, developmental, and administration costs of the vaccine. It was estimated that between 1955 and 1961 about 154,000 cases of polio were prevented by vaccination, resulting in an avoidance of medical care costs of about $327 million. The value of the economic loss avoided is estimated to total about $6.4 billion. The cost of developing and administering the vaccine amounted to about $653 million, thus leaving an estimated net gain of over $6 billion. The benefit so far is thus about ten times as great as the cost. The discovery of the Salk vaccine clearly represents both significant medical and economic advances.

Deaths from cancer of the uterus have declined from about 27.5 per 100,000 in 1930 to 13.6 in 1960. Factors contributing to increased survival have been early diagnosis, refinements in surgical technique, and developments in radiation treatment. Perhaps the most important contribution was the discovery of the smear test by George N. Papanicolaou, M.D., in 1928—the PAP test. Because of this test, increasing numbers of cases are being detected in the early stages of the disease when treatment is more successful and less costly.

The correction of congenital heart defects is both a dramatic illustration of advances in medical technique and a demonstration of the economic importance of heart surgery. Advances have been aided by the improvement in diagnostic techniques, such as angiocardiography and cardiac catheterization and development of the heart-lung machine.

The study points out that saving the lives of fifty boys at age 5 would lead to an estimated increase in net national output of $1 million during the lifetime of these children. Even though costs of treatment are very high, the study concludes that there has been an economic gain from advances in heart surgery.

One advance which has received far less attention than those previously mentioned but which has been of great significance in its effect on mortality has been the improved methods of treatment of tuberculosis. In the thirty years from 1935 to 1965, mortality from this disease decreased by 90 per cent. This decrease has resulted in substantial net economic benefits from persons who would otherwise have died had the 1935 death rates continued. The most significant single advance has been the discovery and development of antibacterial agents—streptomycin, para-aminosalicylic acid (PAS), and isoniazid. The management of tuberculosis is rapidly changing from a clinical to a preventive-medicine approach.

Disposable products, the last area of medical advance that was studied, represents a relatively new and rapidly developing factor in hospital care. The case history of the disposable syringe and needle combination illustrates the growth of disposable products. Since its introduction in 1957, its use has grown until today 78 per cent of the short-term hospitals use this combination for approximately one-third of all syringe procedures performed. During this period the cost has decreased from 13½ cents to 6⅛ cents per combination. It is estimated that purchases of *all* disposable medical products in 1963 exceeded $125 million

and that projections indicate the volume will be in excess of $300 million by 1970.

Volume IV studies changing patterns of hospital care, describing variations in services available to hospitalized patients over the fifteen-year period 1946–61 and the changes in cost.

Perhaps no component in our present cost of living has received as much attention in recent years as that of the cost of hospital care. The study points out that it is particularly important to define the service that is being purchased in attempting to analyze the changing costs of hospital care. Medical care purchased in 1946 is not the same as that purchased in 1961. Illnesses that are prevalent today are not the same as those that were encountered most frequently in 1946. This volume attempts to analyze changing patterns of hospital care. It describes hospital care for those illnesses causing the largest proportion of all hospitalizations and then analyzes fifteen selected diagnoses in depth.

Chapter v discusses the patterns of care for over fifty different illnesses requiring hospitalization. Dramatic advances such as those reported in Volume III have not occurred in the case of all illnesses. Where there has been little change in the hospitalization pattern, or where there are indications of increased hospitalization, or longer durations of hospital stay, attempts have been made to give possible reasons for such changes. For example, it is noted that the incidence of hospitalization for rheumatic fever, contrary to what would be expected from the effective use of penicillin, has not declined during the period of study. One possible explanation given is that the increased use of corticosteroids in treatment of this disease has necessitated hospitalization for close observation.

For those who wish to examine more closely the changes in hospital care that have occurred during the period of study, fifteen selected diagnoses are presented for study in chapter vi. Analyses of the changes in pattern as shown for these selected diagnoses give many clues to the increased costs of present-day care. The use of complicated and expensive diagnostic procedures, almost universal utilization today of laboratory procedures which were uncommon fifteen years ago, increased use of wonder drugs, and an increase in the use of blood and blood derivatives—all have improved the quality of medical care while greatly increasing the cost of it.

Prospects for even greater medical advances are bright, and the American public has indicated a willingness to accept, within reason, the cost of providing for these advances. The public in general and persons in the health insurance field in particular can, by the reading of this report, obtain valuable information concerning the true costs of medical care.

K. Arne Eide
Theodore Allison[5]

*M. Lerner and O. W. Anderson, *Health Progress in the United States, 1900–1960*, pp. xv, 354, University of Chicago Press, Chicago, 1963.

[5] Mr. Allison, not a member of the Society, is Research Associate in the Metropolitan Life Insurance Company.

This book deals with various aspects of the health of the American people in the period from 1900 to 1960. These aspects range widely, from the average rate of mortality for the country in 1900 (the authors consider a high death rate, especially from communicable diseases, a manifestation of ill-health) to the charges made for hospital services in Indiana in 1956.

The studies described in the book are documented with a wealth of statistics and are illustrated by well over one hundred charts. The data used were developed largely by agencies of federal government (but some state data are presented), the principal sources being the Division of Vital Statistics and the National Health Survey Program. Both of these sources are the responsibility of the National Center for Health Statistics.

The material covered in this volume is divided into five sections, concerned respectively with mortality trends, differentials in mortality (male versus female; urban versus rural; white versus nonwhite; rich versus poor; United States versus other advanced nations), illness and impairments, economic aspects of health, and the social consequences of declining mortality. The first three of these sections are familiar subject matter to most North American actuaries, and the features presented by the authors from demographic experience accord with observations made in actuarial studies, namely: (*a*) the extraordinary decline in mortality among all segments of the population; (*b*) the marked diminution in the occurrence of the communicable diseases; (*c*) the very substantial reductions in morbidity; (*d*) the increasing prominence, in the past six decades, of the degenerative diseases as causes of death; and (*e*) the relatively more favorable improvements in the foregoing for females as compared with males and for nonwhites as compared with whites, but the latter are still at an advantage. The authors call attention to the tendency for good health and low mortality to be associated with the more favored groups in the population, as far as income and social status are concerned. They also note some significant relationships between morbidity and mortality, on one hand, and geography, on the other.

An anomalous situation for which no explanation is attempted appears with regard to morbidity experience according to sex. Several reports by the United States Public Health Service extending from the 1920's through the 1940's and by the United States National Health Survey, more recently, indicated significantly higher rates of illness among women than men. Such a differential was observed for nondisabling illness, for disabling illness, for bed cases, and for chronic cases. Other studies showed that women consulted physicians in private practice more frequently than men, even after visits for conditions peculiar to females were omitted in the comparison. This characteristic sex differential in morbidity contrasts with a one-day census of the nation's hospitals in 1953 which showed that men constituted a definitely larger proportion of the hospital-patient population. A similar situation of greater morbidity for males was reported in the major medical experience of the New York Life by Lowell M. Dorn.[6]

[6] *TSA*, XVI, 275.

In addition to sections of the book concerned with the communicable diseases, heart disease, cancer, and diabetes, there are chapters dealing with poliomyelitis, mental illness, the venereal diseases, dental health, and blindness. The substantial changes which have taken place in the incidence of these conditions are reported in considerable detail.

The sections of the book devoted to the economic aspects of health should be particularly interesting to actuaries engaged in determining the price of benefits provided for sickness and hospital care. The chapters dealing with the patterns of hospital use, trends in hospitalization according to diagnosis, and hospital use and charges by diagnostic category contain a great deal of useful material. Especially interesting to actuaries involved in the development and administration of health insurance should be the chapters concerned with the increased utilization of medical care, trends in consumer expenditures for health, and the growth of voluntary health insurance.

In connection with their discussion of the mortality decline between 1900 and 1960, the authors point out the great changes in the expectation of life at birth and at various ages by sex, color, and geographical division. Prospects for further increases in longevity, assuming that several of the present-day leading causes of death are completely eradicated, are developed. The authors also discuss the more rapid increase in the proportion of females at the older ages as compared with males consequent to differentials in mortality. Other topics covered are the rise in the aged population of both sexes and the consequences of such population shifts.

The chapter titled "Health and the Family" deals with the trend in marital dissolution and in the changing patterns of widowhood and orphanhood. One of the important conclusions of this chapter is that the lower rates of death during the working period of life since 1900 and the longer average lifetime enjoyed by the several segments of the population since then result in an extended working expectation of life and in a longer average lifetime in retirement.

A large part of the field covered by this book has been intensively cultivated by American and Canadian actuaries; some portions, one might say, are their special province. Yet the authors do not once refer to any part of the sizable accumulation of facts concerning mortality and disability recorded in the literature of this continent's actuaries. Ironically, the authors themselves say, in this context: "A great deal of data in the health and related fields are collected routinely by public and private agencies and are too little exploited for scientific as well as strictly practical purposes."

The Society's studies of mortality, disability, blood pressure, and impairments might well have been cited, especially for those facets not available in other sources. Much, too, in individual papers could have been utilized.

LOUIS LEVINSON

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 Security"; 5—"Other Topics."

The review section of the *Journal of the Institute of Actuaries* contains digests in English of articles appearing in foreign actuarial journals.

Actuarial and Other Mathematics, Statistics, Graduation

O. Lundberg, *On Random Processes and Their Application to Sickness and Accident Statistics*, pp. vii, 172, Almqvist & Wiksells Boktryckeri AB, Uppsala, 1964.

"The present work is an endeavor to enlarge the theoretical basis for the actuarial application of random processes with special reference to accident and sickness insurance."

Life Insurance and Annuities

*M. E. Ogborn, *Staple Inn*, pp. 27, Institute of Actuaries, London, 1964.

In his Introduction the author writes: "Staple Inn has meant much to generations of actuaries. The dignified home has had a formative influence on the profession. . . . Recent historical research has thrown new light on much that was dark in the story of England and its capital. This treatise attempts to reassess the evidence concerning Staple Inn with the help of what is now known." The subsequent account has sections titled: "The Merchant City," "Le Stapled Halle, 1300–1400," "The Society of Staple Inn, 1400–1600," "The Wool-Pack Insignia," "An Inn of Chancery, 1600–1800," "Jetsam of History, 1800–1884," "A Home of Actuaries," "Renascence," "Acknowledgments," and "Notes on Sources and Reading." The brochure is illustrated, with several in color.

*National Center for Health Statistics, *United States Life Tables: 1959–61*, Vol. I, No. 1, pp. 31, and No. 2, pp. 23, Public Health Service, Washington, D.C., December, 1964.

Number 1 contains the official complete life tables based upon the census of population, taken April 1, 1960, and recorded deaths for 1959–61. The life tables included are those for the total population, total males, total females, total whites, white males, white females, total nonwhites, nonwhite males, and nonwhite females. Comparable abridged data are shown for the previous decennial life tables.

Number 2 contains the actuarial tables based upon the new official life tables. The basic actuarial functions for total males, total females, white males, white females, nonwhite males, and nonwhite females are shown at interest rates of $2\frac{1}{2}$, $3\frac{1}{2}$, and $4\frac{1}{2}$ per cent. In addition, tables for white males and white females are shown at interest rates of 3 and 4 per cent. These life tables are described in the paper by Robert J. Myers and Francisco Bayo in this issue of the *Transactions*.

*W. Sachs and G. Drude (editors), *Dictionary of Actuarial and Life Insurance Terms*, 2d Edition, pp. 308, Verlag Versicherungswirtschaft E.V., Karlsruhe, 1964.

This is a multilingual dictionary in English, French, German, Italian, and Spanish. There are five sections, one for each of the languages. Within each section, the terms are

listed alphabetically according to the language, and opposite each, in columnar arrangement, are listed the translations into the other four languages.

Health Insurance

L. S. Reed, *Blue Cross–Blue Shield Nongroup Coverage for Older People*, pp. 54, Social Security Administration, Washington, D.C., 1964.

Early in 1962 the Blue Cross and Blue Shield announced a nation-wide effort would be made later that year to make available to older people throughout the nation a certain level of health insurance coverage. This study describes in some detail the nongroup initial enrollment contracts actually offered by the Blue Cross–Blue Shield plans to older people during the fall of 1962 and early winter of 1963. It compares these coverages with the nongroup contracts made available to the aged prior to October, 1962, and with the recommended standards for plan offerings. Information is not available on the number of older people who have been enrolled under these newer contracts. However, estimates newly developed by the Blue Cross and Blue Shield associations of total enrollment of persons aged 65 and over show a significantly smaller increase in total enrollment during 1962 than had occurred during 1961, particularly in the case of Blue Cross. The figures are given at the end of the Introduction and Summary of this report.

L. K. Young, *A Study of Health Insurance Policies Available in New York State for the Purpose of Developing a Procedure for Their Evaluation and Grading*, pp. 25, li, Sloan Institute of Hospital Administration, Cornell University, February 7, 1964.

The publication describes a method of evaluating and grading health insurance policies. Work on this project was undertaken at the request of the New York State Joint Legislative Committee on Health Insurance Plans.

According to the procedure described, four broad groups of policy provisions were designated for evaluation—hospital expense benefits, professional expense benefits, exclusions and restrictions, and miscellaneous benefits, most of which are "not yet generally included in policies." Six items were included within each of the first three groups, and eight items were included in the last group. In grading a particular policy, ratings are assigned to each of these items according to an ordinal scale from A to D. The grade assigned to the lowest-rated item in each group is taken as the rating for the entire group, and the end result is a series of four grades for a single policy. A major reason for using multiple ratings rather than a single index was that the author was unable to find "a common denominator, or mutually convertible equivalent, for the diversity of policy benefits and provisions."

The grading procedure had "the single objective of providing guidance to prospective purchasers of insurance, in the selection of policies offering a maximum of protection with a minimum of restrictions per dollar of premium." Premium rates were not included as an element to be graded. According to the grading system, a policy cannot receive A ratings unless it provides full service benefits without deductibles or coinsurance. With regard to the grading system, the report acknowledges that "this procedure has not yet been perfected, and it is not yet ready for implementation."

Ratings were published in the report for one hundred individual and family policies sold in New York State. These included policies of all the Blue Cross and Blue Shield plans and a selected list of policies from insurance companies and independent plans. The author later explained in a letter to the *New York Times* (July 20, 1964), in response to criticism of the study, that this was not a representative sample, stating: "Several

excellent companies have been represented in the list by one of their poorer policies, and more than one marginal company has been represented by its best policy."

*R. C. Horn, *Subrogation in Insurance Theory and Practice*, pp. xxv, 371, Richard D. Irwin, Inc., Homewood, Ill., 1964.

The purpose of the chapter on "Subrogation in Health Insurance and Health Service Plans" is to re-examine the traditional view that subrogation is not applicable to health insurance contracts. The author suggests that there is "a very distinct possibility of subrogation under health insurance, if the policies contain express provisions." He reports that some insurers now include subrogation clauses in group major medical contracts, and he presents data on the extent to which Blue Cross and Blue Shield plans have exercised subrogation rights. A Michigan verdict allowing enforcement of a subrogation clause in a Blue Shield agreement is regarded as a landmark decision. Although many state insurance departments object to subrogation under health insurances, the author predicts the issue will be tested again in the near future.

U.S. National Center for Health Statistics, *Acute Conditions, Incidence and Associated Disability, United States, July 1962–June 1963*, pp. 66, Public Health Service Publication No. 1000, Series 10, No. 10, Washington, D.C., June, 1964.

Incidence rates and durations of restricted activity and of bed disability per one hundred persons per year are presented according to age and sex for categories of specific acute conditions. Time lost from school and from work is also shown for groups of acute conditions with details by age and sex. Other data, according to age and sex, relate to urban and rural areas, to regions of the United States, and to calendar quarters of the survey period.

U.S. National Center for Health Statistics, *Bed Disability among the Chronically Limited, United States, July 1957–June 1961*, pp. 62, Public Health Service Publication No. 1000, Series 10, No. 12, Washington, D.C., September, 1964.

On the basis of definitions used in the National Health Survey, it is estimated that 41.4 per cent of the civilian, noninstitutional population of the United States "had one or more chronic diseases or impairments during the 4-year period from July 1957 through June 1961" and that these persons had an average of 10.7 days of bed disability per person per year, compared with 3.3 for persons with no chronic conditions. Comparable data are presented, by age, according to sex, geographic region, family income, and living arrangements.

U.S. National Center for Health Statistics, *Health Insurance Coverage, United States, July 1962–June 1963*, pp. 37, Public Health Service Publication No. 1000, Series 10, No. 11, Washington, D.C., August, 1964.

The results presented were derived from responses given in household interviews in a probability sample of the civilian noninstitutional population of the United States. The respondent in the household may answer for others not present. The report states: "Only 1 percent of the households scheduled for interview resulted in respondents refusing to give any information. Of the persons with whom the regular interview was completed, 0.6 percent did not know if they had hospital insurance coverage and 1.6 percent did not know if they had surgical insurance coverage." Plans excluded from the report are those limited to dread diseases, free-care plans, plans paying only for accidents or for conditions incurred on the job, and plans paying only for loss of time.

Only hospital and surgical insurance is considered. The variables discussed are family income, age, geographic regions, and employment. Table 1 presents the findings with regard to family income and age.

TABLE 1

PERCENTAGE OF PERSONS WITH HOSPITAL INSURANCE AND WITH SURGICAL INSURANCE, BY FAMILY INCOME AND AGE, UNITED STATES, JULY, 1962—JUNE, 1963

AGE (YEARS)	FAMILY INCOME					
	All Incomes*	Under $2,000	$2,000–$3,999	$4,000–$6,999	$7,000–$9,999	$10,000 and Over
	Hospital Insurance					
All ages	70.3	34.1	51.9	79.0	87.3	87.9
Under 15	68.7	21.9	42.8	78.2	87.8	87.3
15–24	66.1	41.6	49.4	73.7	81.4	84.1
25–34	74.7	32.0	51.3	81.4	89.4	87.7
35–44	77.7	30.0	54.3	82.1	91.0	90.6
45–54	77.5	34.7	61.2	83.0	89.8	92.8
55–64	73.2	40.3	65.0	84.4	88.7	89.4
65 and over	54.0	39.0	58.4	66.4	68.1	72.6
65–74	60.8	43.1	64.0	74.4	74.9	79.3
75 and over	41.1	33.2	44.2	46.7	53.2	58.2
	Surgical Insurance					
All ages	65.2	28.8	46.8	73.9	83.2	82.6
Under 15	64.8	18.5	39.2	74.1	84.1	82.6
15–24	60.6	35.6	43.7	68.2	77.0	78.4
25–34	70.6	26.9	47.5	77.4	85.8	82.9
35–44	73.0	25.9	49.3	77.0	87.5	85.9
45–54	72.2	30.0	56.2	77.1	85.6	88.0
55–64	66.7	34.3	59.1	77.4	83.8	83.0
65 and over	45.7	32.0	50.3	56.4	59.6	62.4
65–74	50.5	35.4	55.5	65.1	67.4	70.1
75 and over	33.1	27.4	37.4	35.2	42.8	45.8

* Includes unknown income.

U.S. National Center for Health Statistics, *Glucose Tolerance of Adults, United States, 1960–1962*, pp. 25, Public Health Service Publication No. 1000, Series 11, No. 2, Washington, D.C., May, 1964.

The data in this report were derived from the Health Examination Survey based upon a nation-wide probability sample of persons aged 18–79 years.[7] "Altogether, 6,672 persons were examined during the course of the survey which was begun in October 1959 and completed in December 1962." The sample was taken of the civilian noninstitutional population.

"A history of diabetes was considered definitely diagnostic if the examinee reported the use of insulin or an oral hypoglycemic agent. If the disease was reported to have been diagnosed by a physician but the person was not on medication, the case was accepted as definite known diabetes, unless the blood glucose level was below 138 mg. per cent

[7] See *TSA*, XIV, 563, for a description of this survey.

without challenge or 148 mg. per cent with challenge." The number of adults with definitely known diabetes per 100 persons for the United States during 1960–62 is shown below:

Age (Years)	Both Sexes	Males	Females
Total—18–79....	1.8	1.3	2.1
18–24.....	0.3	0.2	0.5
25–34.....	0.4	0.2	0.6
35–44.....	0.9	1.1	0.8
45–54.....	2.0	1.1	2.9
55–64.....	3.3	3.3	3.2
65–74.....	4.8	3.2	6.1
75–79.....	4.7	2.7	6.7

U.S. National Center for Health Statistics, *Blood Pressure of Adults by Age and Sex, United States, 1960–1962*, pp. 40, Public Health Service Publication No. 1000, Series 11, No. 4, Washington, D.C., June, 1964.

The data for this report were obtained from the first cycle of the Health Examination Survey and relate to a sample of the civilian noninstitutional population of the United States who were given a standard examination. Subdivision of this sample according to age and sex yields averages that are subject to large sampling variability. The published report shows average blood pressures by ten-year age groupings for the most part. The following unpublished averages by five-year age groupings were furnished upon request.

AVERAGE BLOOD PRESSURES IN MM. HG., UNITED STATES, 1960–62

AGE (YEARS)	SYSTOLIC		DIASTOLIC	
	Males	Females	Males	Females
All ages, 18–79.	132.1	129.9	79.4	78.1
18–19.....	118.7	110.5	69.9	68.8
20–24.....	122.9	112.3	72.3	69.6
25–29.....	122.7	113.7	74.8	71.3
30–34.....	126.2	117.6	77.6	74.5
35–39.....	127.4	120.3	79.6	76.8
40–44.....	129.7	125.7	81.7	79.4
45–49.....	132.1	131.5	83.0	81.4
50–54.....	135.7	136.7	83.4	82.7
55–59.....	138.7	143.2	83.3	84.2
60–64.....	141.9	150.9	82.9	85.8
65–69.....	146.0	156.6	81.3	84.8
70–74.....	150.7	165.0	80.6	82.2
75–79.....	154.3	156.6	79.4	79.3

Higher blood pressures were found with larger arm girths. However, for any given arm girth, the average blood pressure rises with age. Also, average blood pressures varied little during the day.

U.S. National Center for Health Statistics, *Blood Pressure of Adults by Race and Area, United States, 1960–1962*, pp. 20, Public Health Service Publication No. 1000, Series 11, No. 5, Washington, D.C., July, 1964.

"There were only slight differences between regions of the United States in mean blood pressure level, but these differences were statistically significant.

"No differences in blood pressure level were demonstrable between places . . . of different population size or between urban and rural areas or between subdivisions of such areas.

"The blood pressure of Negro adults was greater than the blood pressure of white adults, by 5.6 mm. hg. systolic and 5.0 mm. hg. diastolic. The comparison was about the same if the South is considered separately." The data suggest that "part of the recorded racial difference in blood pressure readings may arise from greater tension on the part of Negro examinees at the time of examination."

U.S. National Center for Health Statistics, *Heart Disease in Adults, United States, 1960–1962*, pp. 43, Public Health Service Publication No. 1000, Series 11, No. 6, Washington, D.C., September, 1964.

This is another in the series of reports obtained from the first cycle of the Health Examination Survey. The cardiovascular evaluation included a self-administered medical history and a few additional questions asked by a receptionist. This was reviewed

TABLE 1

PERCENTAGE OF PERSONS WITH SPECIFIED HEART DISEASE DIAGNOSIS, BY AGE AND SEX, UNITED STATES, 1960–62

HEART DISEASE DIAGNOSIS	AGE (YEARS)							
	18–79	18–24	25–34	35–44	45–54	55–64	65–74–	75–79
Definite heart disease:								
Both sexes	13.2	1.2	2.4	6.7	13.2	25.3	39.9	42.3
Males:	12.6	1.4	2.9	7.4	13.8	24.2	33.2	38.8
White	11.5	1.4	2.5	6.1	11.3	22.5	31.3	39.3
Negro	23.8	1.9	7.9	18.1	33.0	41.6	56.9	32.3
Females:	13.7	1.1	2.0	6.1	12.5	26.2	45.2	45.8
White	12.5	0.8	1.4	4.9	9.6	23.7	43.5	44.8
Negro	24.8	3.2	6.8	14.0	36.6	52.2	70.1	69.5
Suspect heart disease:								
Both sexes	11.7	4.0	4.9	8.8	15.3	19.4	20.7	25.2
Males:	13.9	6.4	6.6	11.4	18.3	18.5	25.3	27.1
White	13.5	6.3	5.5	10.6	18.4	17.6	26.4	25.3
Negro	17.6	6.7	16.9	16.7	18.2	28.2	11.9	50.3
Females:	9.7	2.0	3.3	6.4	12.4	20.1	17.1	23.3
White	9.3	1.2	2.6	5.4	11.8	20.3	17.3	23.4
Negro	12.6	8.3	7.8	13.0	14.8	20.3	16.2	14.2
Definite hypertensive heart disease:								
Males:								
White	6.5	0.2	1.1	4.0	7.7	11.7	16.3	24.0
Negro	19.1	1.9	5.2	15.2	24.4	33.1	50.2	32.3
Females:								
White	9.8	.....	0.7	2.7	6.8	19.5	37.5	37.1
Negro	22.2	1.6	4.7	14.0	31.5	46.4	66.4	69.5
Suspect hypertensive heart disease:								
Males:								
White	5.0	1.5	1.2	4.0	4.3	7.3	13.8	15.7
Negro	7.6	1.5	7.3	6.2	10.5	13.8	.....	21.4
Females:								
White	3.3	.....	0.7	0.8	3.4	8.5	8.4	10.7
Negro	4.7	.....	.....	3.6	5.9	15.0	10.3	14.2
Definite coronary heart disease:								
Males:								
White	3.8	.....	0.1	1.2	3.0	10.3	12.2	9.8
Negro	3.2	.....	3.1	.....	7.4	5.7	3.4	.....
Females:								
White	2.1	.....	0.2	0.4	1.3	4.7	8.2	5.1
Negro	2.0	.....	.....	1.0	3.9	5.5	5.1	.....
Suspect coronary heart disease:								
Males:								
White	2.1	.....	.....	1.0	3.5	4.2	5.1	4.1
Negro	3.1	.....	.....	3.5	2.8	7.7	7.5	.....
Females:								
White	2.2	.....	0.2	0.5	2.4	5.3	6.2	8.5
Negro	2.2	.....	.....	0.9	4.1	4.3	9.0	.....
Rheumatic heart disease:								
Both sexes	1.1	0.5	0.5	1.1	1.5	1.3	2.2	3.3
Males	1.2	0.4	0.5	1.1	1.1	1.3	3.0	3.8
Females	1.1	0.5	0.6	1.0	1.8	1.3	1.5	2.9

by the examining physician to correct inconsistencies and for incompleteness. The report reproduces the forms used and also shows the criteria and classifications used in electrocardiographic reading; another section deals with the interpretation of the chest X-ray. The statistical findings are shown in Table 1.

Social Security

*R. J. Lampman (editor), *Social Security Perspectives: Essays by Edwin E. Witte*, pp. xx, 419, University of Wisconsin Press, Madison, 1962.

In introducing this selection from Professor Witte's writings on social security, Professor Lampman, who, as did Witte and John R. Commons before him, occupies the Chair of Economics at the University of Wisconsin, treats it as part of a trilogy. The first volume, which appeared a quarter of a century before the other two, was *Social Security in America: The Factual Background of the Social Security Act as Summarized from Staff Reports to the Committee on Economic Security.*[8] These staff reports were largely written by Witte himself, or under his direction. The second—*The Development of the Social Security Act*—received a recent notice in these pages,[9] where reference was made to its "historical" role. The present volume, according to Lampman, is the most "popular" of the three, which, taken together, will give the reader "a good insight into Witte's role in the field of social security." That role, as indicated on the jacket, is conceived to be nothing less than "architect of the Social Security Act."

The included essays, of which the earliest ("Unemployment Insurance") dates from 1928 and the latest ("The Objectives of Social Security") from 1959, are grouped into four sections. Part I (ten essays) takes in general considerations of social security, Part II (ten essays) old age, Part III (eight essays) issues in unemployment, and Part IV (seven essays) issues in health.

The volume ends with a much more extensive bibliography (over three hundred titles listed chronologically) of Witte's social security writings. He also wrote extensively in economic and other fields.

**Ninth Actuarial Valuation of the Assets and Liabilities under the Railroad Retirement Acts as of December 31, 1962, with Technical Supplement*, pp. xii, 92, U.S. Railroad Retirement Board, November, 1964.

The main part of this publication constitutes a report on the actuarial condition of the railroad retirement plan as it was amended on October 5, 1963. The 1963 amendments had the purpose of strengthening the financial basis of the plan by increasing the earnings base and permitting higher returns on investments. As a result of these amendments, the actuarial condition of the system has improved to a point where the deficiency is now only 0.41 per cent of taxable payroll or $18 million a year on a level basis.

The Technical Supplement includes a listing of all assumptions, a complete set of decrement rates, and a reproduction of all mortality and remarriage tables that were used in the valuation. In addition, the supplement contains summaries of mortality, retirement, disability, withdrawal, and other studies. Other parts of the supplement deal with age and service distributions, salary scales, future payrolls, dual coverage under railroad retirement and social security (OASDI), and other matters pertinent to the valuation.

[8] Washington, D.C.: Government Printing Office, 1937.

[9] *TSA*, XIV, 568.

OTHER TOPICS

R. Freedman (editor), *Population: The Vital Revolution*, pp. vi, 274, Doubleday & Company, Inc., Garden City, N.Y., 1964.

P. M. Hauser (editor), *The Population Dilemma*, pp. iv, 188, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1963.

H. S. Simpson (editor), *The Changing American Population*, pp. 111, Institute of Life Insurance, New York, 1962.

Although these three volumes, published as paperbacks, have some topics in common, together they furnish a background to current thinking on population problems. The first of these contains, with some modifications, the series of nineteen lectures broadcast by specialists over "The Voice of America" in its "Forum Series" in November, 1963, to eighty-five countries. The second contains seven papers prepared as background reading for the Twenty-third American Assembly at the Arden House Campus of Columbia University, May 2–5, 1963. The third publication, with papers by four authors, is a report of an Arden House Conference sponsored jointly by the Graduate School of Business, Columbia University, and the Institute of Life Insurance.

D. B. Hertz and R. T. Eddison (editors), *Progress in Operations Research, Volume 2*, pp. 455, John Wiley & Sons, Inc., New York, 1964.

This is the second volume in a series sponsored by the Operations Research Society of America. In contrast with the first volume, which dealt with progress in techniques, the current volume reviews the application of operations research to business and government organizations. Separate chapters survey applications in the major functional areas of management—production, marketing, distribution, systems analysis, capital budgeting, and long-range planning. Other chapters review the status of operations research in the fields of government planning, community service, transportation, agriculture, mining, steel, petroleum, textile, electric power, chemical and pharmaceutical industries, and in the national ballistic missile and space programs. References to expository articles on techniques and to source articles on applications are listed in a bibliography at the end of each chapter.