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BOOK REVIEWS AND NOTICES*

*H. W. Haycocks and W. Perks, *Mortality and Other Investigations* (Volume I), pp. ix, 164, published for the Institute of Actuaries and the Faculty of Actuaries at the Cambridge University Press, 1955.

Under the current examination syllabus of the Institute of Actuaries, the subject of this book—Mortality and Other Investigations—is divided between two sections of the readings. The authors point out that the scope and standard of the present volume are, therefore, determined by its purpose. The essential emphasis is on principles rather than a detailed treatment of investigations that have been made. The limitations to the scope of this volume are defined negatively by reference to the examination syllabus—a detailed treatment of selection, of multiple decrements and of continuous exposed to risk formulas is not included.

The volume consists of nine chapters, which may be considered as falling into five sections. Chapter I contains a general discussion of the features of actuarial statistics, and the authors suggest that some readers may find it preferable to leave this chapter until the end. The chapter is written on a fairly sophisticated level and students will probably find that they can digest it more easily and with fuller appreciation after they have mastered the later chapters of the volume.

Chapters II through V present the principles of exposed to risk formulas for mortality investigations. The authors have used an interesting approach. They begin with an analysis of the principles involved in finding a group mortality rate for a one year investigation period. The periods considered include a single calendar year, a year which runs from the birthday of each individual in a given calendar year to the birthday in the following calendar year, and a year which runs from the policy anniversary of each individual in one calendar year to the anniversary in the next calendar year. By considering each of these time-intervals in succession, the authors are able to indicate the similarities as well as the differences in treatment.

Chapter III extends the treatment to mortality rates which are analyzed by age and by duration, still considering a one year time-interval for the investigation. Here the question of bringing the deaths and the initial populations into correspondence arises and is treated fully, particularly in the case where the investigation covers a single calendar year. While the authors have used some special notation which may at first mislead the student into thinking he is dealing with some elaborate approach by algebra or calculus, the authors eventually point out that broad approaches are adequate and meticulous adjustments are out of place in calculating the exposure. It is good to see the exile of the term

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

"mean age," because this term is probably one of the most confusing in exposure formula jargon. The authors use the phrase "calendar-year age" to mean the difference between the calendar year of the event of death, entry, or withdrawal and the calendar year of birth. Another important feature is the inclusion of four diagrams which help bring the reasoning out of the realm of the abstract.

Chapter IV proceeds to the case where the experience of a number of years is to be combined and Chapter V deals with the adjustments required for new entrants and withdrawals within the investigation period.

The treatment used by the authors allows emphasis on the correspondence between census formulas and formulas based on individual card sortings. Also, there is parallel treatment of formulas which lead to a q type of decrement rate and those which lead to an m type of rate.

Practitioners in the United States will find it interesting that Whittall's notation is not used in the land of its origin. Furthermore, no reference is made to the Balducci approximation, which is in the opinion of the reviewer a fundamental key to understanding of exposure formulas. The authors at one point comment on the approximation, $2 \times_{1/2} q_x \approx q_x$, and point out that this is equivalent to assuming a uniform spread of the deaths over the year of death. This comment, coupled with the omission of any reference to the Balducci approximation, may give students a mistaken notion that the assumption of a uniform distribution of deaths is the foundation of exposure formulas. Many students have been surprised at finding that the Balducci approach does not assume a linear movement of l_{x+t} over the year from $t = 0$ to $t = 1$, but that it assumes that the reciprocal of l_{x+t} follows a straight line over the year.

The authors have perpetuated, and in fact italicized, the inaccurate statement that deaths are given a full year's exposure in the year of death. In the case of a life which enters the experience within the analysis year of age and dies before the end of that year, the exposure given by the usual formulas is equal to the fraction of the year from date of entry to the end of the analysis year. The authors have included an arithmetic example of the application of a continuous exposure formula and have indicated a checking system which should be useful.

Chapter VI of the volume may be considered as the third section. It deals with sickness, withdrawal, retirement, incapacity, marriage and fertility rates. Most of the chapter is devoted to sickness rates and the treatment is the best the reviewer is familiar with. Chapters VII and VIII deal with the principles of graduation, the graphic method, osculatory interpolation and abridged life tables. These chapters cover a portion of the material which students in the United States study from Morton Miller's monograph on graduation and Mortimer Spiegelman's textbook on demography. The treatment in the present volume is succinct but not unduly condensed so that, from a student's viewpoint, it strikes a very happy medium.

The concluding Chapter IX describes the processes used in the construction of the more recent English Life Tables and will be useful for reference purposes to students in the United States. The last sentence of the chapter makes the interesting and profound comment that a master hand was able to make

actuarial bricks with a limited amount of suitable straw. This emphasis on a practical viewpoint is one that all students ought to appreciate. In mortality and similar investigations, particularly, no student is fully mature who does not recognize that he may be confronted with situations in which he can not obtain all the information he might wish to have, or that the information available may not be in the form he would prefer, and that part of the art of the practical actuary, like that of the good chef, is to modify his recipes in such a way that he can produce satisfactory results from the materials at hand.

HARRY GERSHENSON

*D. M. McGill, editor, *Pensions: Problems and Trends*, pp. xv, 211, Richard D. Irwin, Inc., Homewood, Illinois, 1955.

This volume, the sixth in the lecture series of Huebner Foundation publications, discusses the characteristics, trends, problems and implications of pension plans. Each of the 13 chapters covers a separate phase of the general subject and is written by an eminent authority in the pension field.

Although there are obvious advantages in having specialized experts discuss the aspects of the subject in which they are most qualified, there are the disadvantages that each author has a different style and that they do not write equally well. The book, therefore, tends to be uneven in that some discussions are in broad terms and some are rather technical. In spite of this, however, the series of lectures constitutes an excellent treatise on pensions.

In the first two chapters, Mr. McGill discusses the goals and characteristics of public and private pension plans today and gives a broad survey of the economic needs of the aged and how these needs are being met. In the third chapter, W. Rulon Williamson outlines the various forces underlying the private pension movement.

The fourth chapter, by William N. Haddad, a Chicago lawyer, concerns the various tax aspects of private pensions; it is a very commendable job on a complex subject. The author analyzes in some detail the present tax laws as they pertain to pensions, and emphasizes the nondiscriminatory provisions which he notes that the Internal Revenue Service enforces with "crusading zeal." In considering the impact of taxes on the various types of pension plans, I must disagree with his observation that "the tax laws have been reasonably neutral as between insured and uninsured plans."

The next two chapters, "The Economic Impact of Private Pension Plans," by Daniel H. Brill of the Board of Governors of the Federal Reserve System, and "The Impact of Pensions on Capital Formation and Investments," by Roger F. Murray of the Bankers Trust Company, deal with the general economic aspects of pensions, especially as regards investments.

The trends and implications of mortality under retirement plans are discussed by Ray Peterson in the seventh chapter. Actuaries will recognize some of the data from the excellent paper in which he presented the *Ga-1951 Mortality Table (TSA IV, 246)*.

George B. Buck discusses the question of actuarial solvency and describes the various actuarial funding methods. He ends with the truism that "the difficulty with pension plans is that, unlike Mr. Micawber whose state of happiness or misery was immediately ascertainable by an inventory of his pockets, a pension plan's state of happiness or misery may not truly emerge for many years."

The problems involved in adapting pension benefits to meet price level changes are reviewed by William C. Greenough of the Teachers Insurance and Annuity Association and College Retirement Equities Fund. He goes very thoroughly into the entire equity situation, and definitely feels that a portion of retirement savings should be invested in equity annuities, not only as a hedge for the individual but also to aid in the expansion of our American economy.

Frederick P. Perkins analyzes the various types of insured pension plans. He also discusses the elements involved in setting premium rates and in determining experience rate credits or dividends. Mr. Perkins is also concerned about mortality and says, "Although insurance company actuaries have been charged with overconservatism in their mortality assumptions for annuity premium rates . . . past experience shows that this has not been the case." As the counterpart to the preceding chapter, the characteristics of trustee plans are outlined by Kenneth H. Ross. Mr. Ross feels that the substantial development of trustee plans in the 1940's was at least partially due to the overconservatism of insurance companies in that period.

In an interesting nontechnical chapter, Robert L. B. Roessle considers the preparation for life after retirement. He believes that the purpose of pension plans will be defeated if the annuitant is going to have a frustrated old age. He stresses that one must prepare for retirement, that hobbies are not enough and that living with the children is not good either.

The final chapter, by John K. Dyer, Jr., compares American and foreign pension plans. Since many American companies have foreign subsidiaries this subject is of pertinent interest.

In summary, this series of lectures covers almost every aspect of pension problems. Although several of the articles contain much personal opinion—especially as regards the relative merits of insured versus uninsured plans—the book is well worth reading by anyone who is interested in the general subject of pensions.

RALPH H. MAGLATHLIN

J. J. Corson and J. W. McConnell, *Economic Needs of Older People*, pp. xvii, 533, The Twentieth Century Fund, New York, 1956.

This very extensive book, dealing with the problem of old-age security, is the result of action taken by the Twentieth Century Fund in 1950 to focus attention upon this problem. The authors were commissioned to prepare a comprehensive research report. At the same time a Committee on the Economic Needs of Older People was appointed to review the report and make recommendations. This Committee consisted of six persons, with Arthur H. Dean, a lawyer,

as chairman, two labor union officials, two university professors, and an actuary (M. Albert Linton).

The book has fourteen chapters, the last one of some fifty pages being the report of the Committee. In the first five chapters, the authors collect and analyze a considerable body of interesting data relating to the aged. Figures are presented with regard to some population characteristics of the aged, their employment status, health conditions, housing situation, and economic position. Several chapters then describe the private and governmental provisions for economic security, covering the history of private pension plans, the effect of collective bargaining and their present status; also the provisions and status of Old-Age Assistance, Old-Age and Survivors Insurance, and other public plans. The section dealing with the OASI program contains a number of factual errors that do not particularly affect the arguments and conclusions drawn but, nonetheless, could have been easily avoided within the necessary space limitations.

One chapter deals with possible ways of providing old-age security other than the existing dual OASI-OAA method. Such alternatives include the Townsend Plan, the Meriam (of Brookings Institution) Plan, Social Budgeting (by W. R. Williamson), Senator Butler's Plan and, as the authors state, the "more practical alternative" of the U.S. Chamber of Commerce proposal. Each of these is discarded as being undesirable for reasons given by the authors.

The last chapter in the research report deals with "How Well Can We Provide for the Aged?" The very important point is brought out that, although the aged population may be increasing relative to total, the future ratio of nonproducers to producers will be more or less constant. Moreover, a steady growth in productivity is anticipated. All in all, therefore, there should be quite ample resources to allocate for the support of the aged.

The authors draw certain conclusions. First, the OASI system should be changed to provide monthly disability benefits, to provide higher benefits for the aged widows and also a lower eligibility age for widows (perhaps 55 or 60, instead of 65), to adjust benefits to keep abreast of price changes, and to cover all gainful employment (other than railroads). Second, OAA should be relegated to a declining, minor, supplementary role. Third, private pension plans should continue to expand with special emphases upon the needs of workers in heavy or hazardous employment and upon providing disability benefits. Fourth, more emphasis should be placed on service benefits for the aged, such as training older workers for jobs requiring less physical effort, preparing persons for retirement, encouraging more home ownership and accumulation of enough resources for use during old age, and providing for the relatively high potential costs of medical care and hospitalization.

The Committee Report first emphasizes the individual's responsibility to take care of himself and save as much as possible toward his own old age. Next is emphasized the responsibility of employers and unions toward providing greater opportunities for employment of older persons and for establishing supplementary private pension plans. Then is stressed the point that the government must play a basic role in this field.

The contributory wage-related nature of the OASI system is endorsed, and extension of coverage to all gainfully employed persons is recommended. In this connection, the Committee proposes that existing systems for government employees and railroad workers should be revised to be supplementary to OASI (one of the union officials, although agreeing in principle, dissents on grounds of practicality). The Committee, with the exception of Mr. Linton, rejects the proposal to blanket-in the current retired noninsured aged, although two other Committee members disagree with the majority view that this proposal is unfair to the present contributors.

The Committee members are divided on the means to provide income to disabled persons. Some favor disability benefits under OASI, while others favor the existing State assistance programs, supplemented by individual and group arrangements. The Committee agrees that OASI benefits should not become inadequate and, with the exception of Mr. Linton, believes that the \$4,200 wage base should be higher, but no specific figure is given. The principle of a retirement test is favored, but it is believed that it should be more flexible, if and when administratively feasible. The Committee is in accord with the present method of financing OASI, but believes that an advisory council should be appointed to study this subject and make recommendations before the next scheduled rate increase in 1960.

The Committee favors the continuation of the OAA program, but believes that the States should assume an increasing share of the cost. Finally, the belief is expressed that the States should be encouraged to extend and develop services for the aged, with respect to health, welfare, employment, housing, etc.

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—Accident and sickness insurance; 4—Social security; 5—Other topics.

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

ACTUARIAL AND OTHER MATHEMATICS, STATISTICS, GRADUATION

United Nations, Statistical Office, *Handbook of Vital Statistics Methods*, pp. iv, 258, New York, April, 1955.

The purpose of this handbook "is to explore current practices, to make conveniently available recommended statistical standards, and to present uniform concepts, definitions, and procedures upon which development of national vital statistics and the improvement of their international comparability may be based." The practices and procedures relate essentially "to those in use in connexion with records and statistics of live birth, death, stillbirth (late foetal death), marriage, and divorce. . . ."

The 14 chapters are concerned with the history, uses and general organization of the vital statistics system; the procedures and responsibilities for the registration of vital events; the collection, compilation and tabulation programs; computation procedures; and, lastly, with present methods for evaluating the efficiency of the vital statistics system. One of the four annexes contains a chronological history of the development of vital statistics.

LIFE INSURANCE AND ANNUITIES

H. A. R. Barnett, "The Components of Mortality," *Journal of the Institute of Actuaries*, vol. 81, part II, no. 358, p. 105, 1955.

"The object of this paper is to build up a new mortality curve from its component parts, as many as possible of these parts having a philosophical background, and the whole fitting the national data. . . . The final conclusions drawn are that mortality can be divided into the following components:

Normal components

- (1) The rate of senescent deaths, an exponential curve.
- (2) The rate of normal anticipated deaths, in the shape of a normal curve.
- (3) The rate of childhood anticipated deaths, apparently in the shape of a harmonic curve.

Components due to abnormalities or disturbances

- (4) The rate of natal deaths, starting at a high level at birth, and decreasing rapidly, with no remaining effect after the first few years of life; a discontinuous curve.
- (5) The rate of early anticipated deaths, a skew cocked-hat shape for males and symmetrical bowler-hat shape for females, due to a number of causes, largely unnatural.
- (6) The additional rate of mortality due to temporary disturbances, the only evidence of such disturbance in the 1951 data being some remaining 'war selection' for males.

"Amongst other advantages, this subdivision of the data should throw much light on the effects of selection."

W. Bolt and E. A. Lew, "Prognostic Value of Life Insurance Mortality Investigations," *Journal of the American Medical Association*, vol. 160, p. 736, March 3, 1956.

The purpose of the paper is to bring the *Impairment Study, 1951* to the attention of the medical profession as a source of information on prognoses. Focus is placed on those results of the *Impairment Study, 1951*, believed to be of general medical interest. These include principally apical systolic murmurs, phlebitis, epilepsy, chronic bronchitis, gastric and duodenal ulcers, gall-bladder disorders, renal stone or colic, Caesarean section, and family history of cardiovascular-renal disease.

B. M. Cohen and M. Z. Cooper, *A Follow-Up Study of World War II Prisoners of War*, Veterans Administration Medical Monograph, U.S. Government Printing Office, Washington, 1955.

This report was prepared by the Follow-Up Agency of the National Research Council in cooperation with the Veterans Administration upon the advice of the Committee on Veterans Medical Problems. A sample of white Army males, who were prisoners during World War II in the Pacific and European areas, was followed for a period of 6 years after liberation. Comparisons were made with combat controls in these areas and a general control. ". . . the possibility of three levels of mortality was visualized: one associated with imprisonment, one with combat and related military experiences, and one with medical selection for military service." It is pointed out among the specific findings that "the survivors of imprisonment by the Japanese experienced a marked excess of mortality during the first 2 years after liberation and a diminished but apparently persistent excess during the next 4 years. The European prisoners, on the other hand, showed no early effect on mortality. The principal causes of death responsible for the mortality excess in the Pacific prisoners are tuberculosis and accidents. After liberation the Pacific prisoners exhibited a wide variety of illnesses as shown by hospital diagnoses. These occurred with frequencies far in excess of those shown by the control groups or the European prisoners and represent nearly every major category of disease. In the European group there was not found a great deal more illness after liberation than was observed in their controls, although they did show a relative excess of malnutrition, psychoneurosis, and gastrointestinal disorders. By far the greater part of the morbidity exhibited by hospital diagnoses in the prisoner groups occurred in the first year after liberation, for the most part in the screening hospitalizations in which the medical status of returning ex-prisoners was evaluated. . . . After the first year following liberation the morbidity levels of both prisoner groups fall appreciably."

U.S. Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics, "United States Life Tables for the First Year of Life, 1949-51," *Vital Statistics—Special Reports*, vol. 41, no. 3, p. 53, September 21, 1955.

The principal life table functions are presented for each of the first seven days of life, for each of the first four weeks, and for each of the first twelve months. The experience relates to the total United States for 1949-51. The functions are shown separately for total persons, total males, total females, total whites, total nonwhites, and separately for each race and sex category. Corresponding values of q_x , l_x , and e_x are also shown for white males and white females in 1929-31 and 1939-41, and for Negro males and Negro females in 1939-41. The method of computation is also described. The author of these tables is Dr. Monroe G. Sirken, with acknowledgment for assistance from Mr. Gustav A. Carlson.

U.S. Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics, "State Life Tables: 1949-51," *Vital Statistics—Special Reports*, vol. 41, supplements, December 22, 1955.

The life tables for individual States are being published in alphabetical order, each in a separate supplement. Life tables were prepared separately for white males and white females in each State, and for nonwhite males and nonwhite females in each of 16 Southern States and the District of Columbia. These tables were prepared in the Statistical Bureau of the Metropolitan Life Insurance Company from mortality and population data supplied by the National Office of Vital Statistics and the U.S. Bureau of the Census. The method of computation was that used by the National Office of Vital Statistics for the "United States Life Tables: 1949-51."

E. K. Rowe, "Health, Insurance, and Pension Plans in Union Contracts," *Monthly Labor Review*, vol. 78, p. 993, September 1955.

According to this report, "At least 11,290,000 workers were covered by some type of health and insurance or pension plan under collective bargaining agreements in early 1954." This compares with about one-half million in 1945, more than 3 million in 1948, and about 7,650,000 in 1950. The estimate is that about 70% of all workers under collective bargaining agreements in early 1954 had at least one type of health, insurance, or pension benefit. These estimates exclude government and railroad workers provided for under federal, state or municipal legislation. Over 60% of those covered were under health and insurance and pension plans, almost 40% had health and insurance protection only, and less than 2% had pensions only. The article summarizes methods of financing, the extent to which benefits are provided employees' dependents and retired workers, and types of benefit in major industry divisions.

**Report of the State Commission on Pensions on Supplementation or Coordination of Social Security Coverage and Benefits of State Employees' Retirement System, State of New York, Legislative Document (1956), No. 15, Albany, 1956.*

This is the second report of the New York State Pension Commission, of which Reinhard A. Hohaus is Chairman. According to the Foreword, the Commission is directed to "undertake a study of the practicable means or methods of coordinating old-age and survivors insurance benefits under the federal social security act with benefits provided by public employee pension or retirement systems maintained by the state and the political subdivisions thereof."

In the present report, the Commission "has confined its study to the State employees' Retirement System, the largest and most comprehensive public employee retirement system in the State. The report includes methods of supplementing or coordinating the benefits of such system with those of Federal Old-Age and Survivors Insurance, and estimates of the costs involved."

**W. M. Mercer, Canadian Handbook of Pension and Welfare Plans, pp. 184, C. C. H. Canadian Limited, Toronto, 1956.*

Written in nontechnical language, this book describes the essential features of numerous types of employee welfare benefits such as pension plans, group life insurance, accident and sickness insurance, stock purchase plans, profit sharing plans, etc. It is designed in the main for the use of personnel officers, union executives and others who occasionally need to know something about these matters. The book contains several useful appendixes which reproduce the relevant provisions of the Canadian Income Tax Act, the rules governing the approval of pension plans for income tax purposes and a selected group of decisions of the Income Tax Appeal Board.

Group Insurance Committee of the Canadian Association of Actuaries, *Principles of Practical Group Life Insurance Administration*, pp. 84, The Canadian Association of Actuaries, Toronto, 1955.

The first edition of this booklet was published in 1950 (*TSA* II, 518). This revised edition covers very much the same ground as the first, except that it reflects some of the more important changes that have occurred in group life insurance practices during recent years.

ACCIDENT AND SICKNESS INSURANCE

"Major Medical Expense Insurance," pp. 33, Chamber of Commerce of the United States, Washington, February 1956.

The first article of this brochure, by A. M. Wilson, describes the origin of major medical expense insurance for employees and its subsequent development, including coverage for dependents and retired personnel. In a second article, by E. B. Whittaker, an account is given of the operation of group major medical insurance, with a discussion of current trends. A subsequent article, by J. F. Follmann, Jr., deals with individual and family policies; among the topics covered are the conditions qualifying for benefit and renewability. The outlook and social significance are discussed by H. S. Beers in the fourth and final article.

R. W. Osler, *Guide to Accident and Sickness Insurance*, pp. 168, The Rough Notes Co., Inc., Indianapolis, July 1955.

The book is intended as a review and quick reference for the experienced accident and sickness agent and as the first book in a training course for the agent new to the accident and sickness field.

The early chapters of this book deal with the opportunity and importance of accident and sickness, the contents of accident and sickness policies, and the nature of the benefits. The author then discusses the individual policy provisions, standard provisions, and uniform provisions of accident and sickness insurance, with his interpretation of them. In addition the application, underwriting, rating, reserve, and claim procedures are presented, together with a discussion of their importance and the responsibilities of those connected with them. Classes of accident and sickness insurance, state, social, and cooperative coverages, regulation of the business, and the history and development of accident and sickness insurance are covered in the final chapters of the book.

"Digest of One-Hundred Selected Health and Insurance Plans Under Collective Bargaining, 1954," Bulletin No. 1180, Bureau of Labor Statistics, United States Department of Labor, Washington, June 1955.

The plans in this digest "were chosen . . . because they covered large numbers of workers in major industries, or because they illustrated different approaches to health and insurance coverage, or because of their interest to the general public evidenced in inquiries received by the Bureau." Among the significant changes since an earlier digest of 1951 "have been (1) the broadening of the health and insurance 'package' to include additional benefits, (2) the extension of benefits to dependents of employees and, to a lesser degree, to retired employees and their dependents, and (3) the general increase in the amounts of the benefits provided." Single employer and multi-employer plans are described separately, each classed according to industry. The digest summarizes, in addition, state temporary disability laws which affect some of the plans and also describes three prepaid medical care programs used by one or more of these plans.

Committee on Prepayment Medical and Hospital Service, "Summary of Survey of Physicians' Attitudes Toward Voluntary Health Insurance," pp. 31, Council on Medical Service, American Medical Association, Chicago, 1956.

The survey is based on the opinions of over 8,000 physicians who responded to a questionnaire sent to 15,000 physicians who had graduated from medical school prior to 1949. These physicians were selected at random from the records of the American Medical Association. The summary interprets the answers to the questionnaire with regard to basic purposes, benefit structure, benefit payments, and the effects of voluntary health insurance on medical fees. In the conclusion it is indicated that this report should be considered only as research or "background" material.

Research Division of the Department of National Health and Welfare, *Voluntary Medical and Hospital Insurance in Canada*, pp. 72, Department of National Health and Welfare, Ottawa, 1955.

This is the second bulletin issued by the Department dealing with voluntary insurance in the health care field. Unlike its predecessor (*Voluntary Medical Care Insurance: A Study of Non-Profit Plans in Canada*, TSA VI, 637), it has to do with hospital as well as medical expense insurance and covers the plans of insurance companies as well as those of the so-called nonprofit agencies. This new study also deals with such matters as the coverage and level of benefits of the voluntary agencies, their financial experience and the number of Canadians covered under such plans.

Research Division of the Department of National Health and Welfare, *Selected Public Hospital and Medical Plans in Canada*, pp. 128, Department of National Health and Welfare, Ottawa, 1955.

This bulletin deals with public health care plans in Canada. It describes the benefits and experience of the public hospital care plans in the provinces of British Columbia, Alberta and Saskatchewan, the public hospital and medical care plan in the cottage hospital districts of Newfoundland, and the medical care plans operating in Swift Current, Saskatchewan, and in certain other centers of Saskatchewan and Manitoba.

M. G. Taylor, *The Administration of Health Insurance in Canada*, pp. xiv, 270, Oxford University Press, Toronto, 1956.

This publication is primarily concerned with a study of the Blue Cross hospital care plans, medical care plans sponsored by the medical profession and governmentally administered plans of hospital and medical care in Canada. It does not include a detailed examination of the contracts offered by "medical co-ops" and insurance companies but makes frequent reference to them for purposes of comparison or clarification. The main object of the book is to describe the experience of the various plans in meeting the admittedly difficult task of administering the most complex of the "social insurances." The book is concerned with such matters as a description of the prepayment plans and their pattern of organization; the legislative and administrative regulations to which they are subject; the setting of premiums and methods of payment to hospitals and physicians; and the problem of controlling over-use of services.

Department of National Health and Welfare, "Volume of Health Care (National Estimates)," Report No. 8 of the Canadian Sickness Survey, 1950-51, pp. 44, Queen's Printer, Ottawa, October 1955.

This is the eighth in a series of reports based on the Canadian Sickness Survey, 1950-51, to which reference was made in TSA VII, 562. The purpose of the latest report is to

provide estimates by age group and sex of the volume of health care received by Canadians. The volume of health care is estimated according to three different measures, namely, the number of people who received various types of health care, the number of "complaint periods" for which health care was received and the number of units provided of the various categories of health care.

OTHER TOPICS

A. C. Baker, "Ordinary Life Office Organization Using a Large Scale Electronic Computer," *Journal of Institute of Actuaries*, vol. 81, part III, no. 359, p. 203, 1955.

This paper reports in detail how British life-office operations could be managed from a single file of basic records on magnetic tape through the use of an electronic data processing system. The procedures involved were programmed and demonstrated on the Ferranti Mark I Computer. The corresponding systems under consideration for performing life office operations in North American life offices are discussed and important differences from British practices are pointed out.

Among the many observations made are the following:

- (1) The life office organization and methods must be reviewed from first principles and, if necessary, completely altered so that full advantage can be taken of the electronic processes now available.
- (2) For over a hundred years, policy records have been increasing both in number and with respect to the information included. Electronic processes permit a reversion to the original policy record system. The basic policy records would then become (a) the case papers and (b) a policy register in a form acceptable to a computer.
- (3) Results of demonstrations show that a computer can be programmed to operate on a single basic policy record to provide all the information required on policy renewal, to carry out a complete net premium policy valuation, and to print a copy of the record itself.

The paper contains a wealth of detailed information concerning the items carried in policy records, the forms to be used, and the flow diagrams and procedure charts used in planning computer processes. It emphasizes, as have many others, that the main work involved is not in the programming (*i.e.*, the translation of basic steps into code form); instead, it is found in the necessity to completely analyze office procedures and divide them into basic steps.

The paper closes with a general discussion of certain aspects of computer operation such as programming, printing, maintenance, size of computer and with the observation that electronic machinery presents actuaries with an excellent opportunity to review their present life office administration from top to bottom.

*R. E. Schultz, *Life Insurance Housing Projects*, pp. xvi, 154, published for the S. S. Huebner Foundation for Insurance Education, University of Pennsylvania, by Richard D. Irwin, Homewood, Ill., 1956.

The author concerns himself with the activities of legal reserve life insurance companies in the United States in the field of housing developments in a 30-year period. An examination was made of the "statutory limitations and restrictions on life insurance housing investments and . . . into the social and technical problems encountered by the companies in the construction and management of housing projects." Detailed operating data on these investments were assembled and analyzed to ascertain their financial return.

D. Godlow, "The Economics of Sale and Lease-Back Transactions," *The Mortgage Banker*, January 1956.

This article points out the factors usually in back of a sale and lease-back transaction, what both parties expect to accomplish, what have been the real reasons why such a vast amount of investment money has gone into these transactions and what role is played by tax savings.

G. McHugh and H. Holding, "Purchase and Lease-Back—Another Investment Field for Life Insurance Companies," *Journal of the American Society of Chartered Life Underwriters*, vol. 9, p. 293, Fall 1955.

This article describes the technique used for the purchase of real estate and of railroad equipment, noting the advantages and disadvantages to both the seller-lessee, and the buyer-lessor. In conclusion to the real estate portion, it lists the items the insurance company's real estate investment officer should look for in a real estate purchase lease proposal.

In regard to railroad equipment, it points out defects in the conventional equipment trust plan of financing railroad equipment purchases which usually require a 20% down payment. It describes a purchase lease plan for railroad equipment where the investor retains title to the equipment throughout the lease period and rents it to the railroad which maintains and uses it as it would its own.

M. Kaplan and S. A. Miller, "Government Insurance and Economic Risk," *Kyklos*, International Review for Social Sciences, vol. 8, p. 252, 1955.

"This paper addresses itself to several basic economic-actuarial problems in the theory of loan-investment insurance as an instrument of public policy. The vehicle of government insurance which presupposes a framework of private enterprise is designed to provide strategic incentives for the expansion of capital formation in given sectors of the economy by inducing the lender to lend and the entrepreneur to enterprise. Unlike conventional insurance underwritten by private carriers in which the catastrophe hazard is relatively unimportant, in this type of loan-investment insurance the catastrophe hazard predominates. The risk may be defined as economic in nature and cyclical in pattern.

"To treat the economic-actuarial problems, a model loan-investment insurance program is constructed. The first problem considered is the nature of the insurance risk. This is defined as decreasing term insurance with a pronounced catastrophe hazard. . . .

"The second problem is the measurement of the risk. . . . The mortality table for a given loan maturity shows average rates of insurance loss by duration of the insurance contract for the favorable and unfavorable phases of the cycle. . . .

"The third and final problem is the insurability of the risk. . . . The analysis discloses that with a composite insurance premium such surpluses as develop from profitable endorsements can offset the deficits of unprofitable contracts for the business written over a cyclical period."