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BOOK REVIEWS AND NOTICES*

Robert B. Mitchell, *From Actuaribus to Actuary*, pp. 71, Society of Actuaries, Chicago, Ill., 1974, \$2.00 each for the first five copies, \$1.50 each for the sixth and subsequent copies.

The Society of Actuaries observed the twenty-fifth anniversary of its formation under the guidance of a special committee, which commissioned, in addition to two papers viewing the long-range prospects for the actuarial profession in Canada and the United States, a popular history "to stress the importance of recognizing not only the actuarial profession's heritage but also its growing present and future responsibilities and influence." This assignment was entrusted to Robert B. Mitchell, former editor of the insurance journal *The National Underwriter* (Life and Health Edition). No profession finds self-analysis easy. The Twenty-fifth Anniversary Committee was especially wise, therefore, in going to a nonactuary for an examination of the entire actuarial profession. It was fortunate that a writer of Mr. Mitchell's ability, insurance knowledge, and acquaintanceship among actuaries was available to the committee.

From Actuaribus to Actuary, subtitled *The Growth of a Dynamic Profession in Canada and the United States*, is written to be understood by the general reader. A major purpose is to arouse interest in actuarial work among high-school and college students who might have an aptitude for such a career. Every recruiter should have copies available for distribution. Beyond that purpose the book should also aid in widening the public's understanding of what an actuary is and what he does.

The history starts with the beginnings of the actuarial profession in England about two hundred years ago. In his first chapter the author develops the derivation of the title "actuary" from a base probably unfamiliar to most of us. Consulting a dictionary would tell us that "actuary" had its root in the word *actuaribus*, which could be traced back to the Roman Senate. But this information would leave a considerable gap—how did the title "actuary" come to apply to the duties with which it is now associated?

The author brings out that two Englishmen were the keys to the development of the designation "actuary." The first was Edward Rowe Mores, one of the early promoters of the Equitable Life Assurance Society of London (1762) and an avid student of the classics, who appears to have wanted a special name for the chief administrative officer of this new kind of life insurer. The author states, "It was he who brought the designation 'actuary' into the insurance business, though with no thought of any mathematical connotation for it." Subsequently William Morgan was appointed actuary of the Equitable. He proceeded to

* 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*.

develop what we now regard as actuarial science to the point where the title of actuary came to have its modern meaning and ceased to signify the operating head of an insurance company.

Chapter II describes the early actuaries in Canada and the United States and their achievements. The first actuary in the modern sense of being a full-time mathematical officer was Charles Gill, an Englishman who was appointed mathematician of the Mutual Benefit Life Insurance Company in 1849 and later the same year became actuary of the Mutual Life Insurance Company of New York.

Chapter III refers briefly to the needs which brought about the formation of the Actuarial Society of America in 1889 and to the first few years of its existence.

Significant developments in the business to the 1930's as well as the growth of actuarial organizations are covered in Chapter IV. This includes the American Institute of Actuaries, founded in 1909, which merged in 1949 with the Actuarial Society of America to form the Society of Actuaries.

Chapter V, headed "A Time of Challenge and Opportunity," lists several notable developments since the 1930's. Among these are operations research and electronic data processing. The author might have developed the latter area more fully because a prospective actuarial student would be more likely to associate himself with such activities and interests than with charting the course of a submarine. Again, more attention might well have been given to the consulting actuary, particularly in view of the great increase in their numbers.

In Chapter VI, titled "The Actuarial Profession Comes of Age," the author does an especially good job of discussing the accreditation program and the efforts being made to bring about a better public understanding of the actuarial profession. The author also stresses the desirability of further unification of the existing actuarial organizations.

In the final chapter, entitled "Anyone for Extrapolation?" the author contrasts the present scope of the profession with what it was eighty-five years ago when the Actuarial Society of America was founded. He then wonders as to "where the actuarial profession will go in the next 85 years" and states that "forecasts would vary from mildly fantastic to extremely fantastic." This reader is most mindful of the diverse and significant developments and achievements of the actuarial profession during the past eighty-five-year period, although, in his opinion, they pale when compared with the accomplishments in many other areas—aviation as just one example. Surely, however, there would be general agreement with the author's final sentence, which would be most reassuring to the student considering an actuarial career: "But it takes no computer to see that the diversity of activities in the actuarial profession furnishes ample opportunity for anyone entering the profession to find work that will satisfy his capabilities and ambitions."

Finally, the author has more than met the assignment with which he was charged by the Twenty-fifth Anniversary Committee. He has produced a straightforward, interesting, and most readable work.

VICTOR E. HENNINGSEN

Charles A. Will, *Life Company Underwriting*, pp. 271, Life Office Management Association, New York, N.Y., 1974.

The title, *Life Company Underwriting*, does not adequately suggest the contents of this book, which is not limited to life underwriting theory and practice. It also covers office routines, including, sometimes, minute details of clerical steps more or less related to the underwriting process; gives job descriptions; and presents information about life reinsurance in great depth. A good service and clerical organization is an essential complement to a good underwriting department, but a good organization by itself cannot atone for deficiencies in basic underwriting. The organization is the practical side of underwriting; the theoretical side is just as important and has not received the same extensive treatment in the book.

Part I is titled "Underwriting" and consists of eleven chapters. "Selecting the Risk" is a general discussion of the factors requiring evaluation. In the first chapter, Mr. Will is highly critical of the numerical rating system and points out its limitations and shortcomings. Then subsequently, somewhat inconsistently, he proceeds throughout the rest of the book to demonstrate that the system is the best, most concise, and most accurate way of explaining most underwriting concepts, including the preparation of medical underwriting manuals or other such guides. Most underwriters feel that it provides a steadying influence in the step-by-step, systematic appraisal of the many factors involved in the evaluation of each risk the underwriter considers. As the author says, it can be misapplied or misused, and it is not a substitute for judgment.

The author's explanation is inadequate to convey to the average reader some understanding of the relationships between underwriting ratings and mortality data. Judgment and good teamwork between the actuary, the underwriter, and the doctor play large roles in choosing ratings for many, indeed most, impairment classes that lack valid statistics of sufficient volume and reliability. Nevertheless, some reference to actuarial studies, including some of the papers that have covered the translation of mortality experience ratios into underwriting ratings would have rounded out these sections.

The rather lengthy discussion of high-age underwriting problems, in this reviewer's judgment, is not justified by the amount of business that is generally obtained at these upper ages. However, carefully controlled mass-marketing experimentation with strictly limited amounts of issue is said to be financially successful. A high-age applicant, no longer gainfully employed, is, theoretically anyway, highly likely to be a speculative risk—a venture for profit by the person who directly or indirectly pays the premiums.

The plan of insurance credits discussed on page 16 does not seem quite convincing. Such credits assume that a group of people with a given impairment will die at only the normal rate of mortality for a few years and then at a higher-than-normal rate thereafter (presumably after the risk has ended by maturity of the policy). Does this describe any area of reality? Certainly that theory was at one time tested and failed with the underwriting of selected overweights at standard rates. The class as a whole showed extra mortality from the outset.

Levels of underwriting authority are discussed at some length. In the practical world of underwriting, limits are most often determined by the number of skilled underwriters available, by their degree of training and length of experience, and so forth. It need be added only that factors such as age, amount of insurance, and the presence of multiple impairments will determine the degree of skill needed and that different practical decisions will be required with each individual company.

"Underwriting Special Benefits," as covered in Chapter V, is an important area to the practical, intelligent underwriter. It may seem unnecessarily long, yet this reviewer notes a lack of discussion of the basic principles of underwriting guaranteed insurability options such as are found in term and in many other plans today.

In Part II, discussing "Other Life Coverages," the chapter on "Underwriting Group Life Benefits" is very good. The next chapter discusses the underwriting of group excess and other special areas and, by quoting from actual company literature, illustrates current, prevailing practice in guaranteed issue, pension trust, and mass marketing. Should not some statement be made as to the underwriting standards for determining the approvability of group excess amounts? Should they be the same as ordinary or more or less liberal? Also, when doing these other forms of simplified underwriting, what approval standards will tread the narrow line of producing an acceptable mortality level and yet not discouraging the marketing effort by too many rejections? The reader looking for some comments or guidance will find none.

A discussion of "Foreign Travel and Residence Underwriting" might have proceeded more usefully by exploring the underwriting of executives of American multinational companies as a first step. In underwriting abroad the usual tools may be less than ideal—medical examinations by doctors of known qualifications and reliability, attending physician information, or the usual inspection reports may be harder to obtain. After this the underwriting of foreign nationals associated with the same American-controlled corporations could be explored. The natural final step would have to be an evaluation of the underwriting and other problems associated with a full-blown foreign branch or agency operation.

A description of the underwriting department and its management and a discussion of interdepartmental relationships is covered in the four chapters of the final section, Part IV. The section on field relationships might benefit by some editing, but the message is clear: the underwriter must do his job without needlessly alienating any agent by any apparent lack of sympathy or interest in his problems, and he must avoid selling out his company by improper pricing of the company's products. Indeed, the latter is his fundamental responsibility.

The chapter on interdepartmental relationships would be improved by an expanded treatment of the special complementary roles of the underwriter, the actuary, and the medical director. Their working together effectively will result in good underwriting rules and rating practices.

Life Company Underwriting is worth any underwriter's time to read, even

though the reader merely may have his own ideas confirmed. For one reason or another the editing seems to have been done rather casually, and this we trust will be remedied in the next edition.

ALTON P. MORTON

Sylvia A. Law, and the Health Law Project, *Blue Cross—What Went Wrong?*, pp. 239, New Haven and London, Yale University Press, 1974, \$8.95.

The entire book is a well-documented all-out attack on Blue Cross. Only once was it possible to find a passing reference to Blue Cross that could be considered favorable. That was a concession that "some Blue Cross plans have initiated experimental cost control programs." Even in the review of the history of Blue Cross, only the negative aspects are commented on.

On the other hand, such criticism is stated to be the purpose of the book. There is no obligation to present an unbiased point of view. Any reader who believes that Blue Cross and/or the American Hospital Association are at the root of all the problems of medical care costs and inefficiencies of medical care delivery will find this book very much to their liking.

Documentation is one of the book's weaknesses. The text material involves only 160 pages. This is followed by 79 pages of small-print references that are cited in the text. With as many as five cited sources in a one-half page paragraph, it sometimes seems as though the emphasis is on stringing together thoughts or comments from a variety of sources. Any attempt to read the book and keep up with the references would be a disjointed effort.

The book has its precepts set out in Chapter 1, "Introduction." "In a nutshell, this book finds that Blue Cross is most accurately characterized today as the financing arm of American hospitals." There next follow three assumptions that set the tone: (1) "the issues involved in the financing of health services are fundamentally ones of public and social policy"; (2) "in the absence of countervailing pressures, any organization or bureaucracy will attempt to maximize institutional autonomy and stability, particularly financial stability"; (3) "the fundamental powerlessness of the consumer of health and hospital care."

Briefly, Chapter 2, entitled "A Unique American Institution," details the growth and special financial and tax status of Blue Cross. Problems of state supervision, the lack thereof, and hospital domination of Blue Cross boards are set forth.

Chapter 3, "Blue Cross and Federal Health Programs," develops the role of Blue Cross in the Medicare and Medicaid programs. The chapter presents a picture of costs rising out of control and a lack of supervision and auditing, and it further reinforces the concept of an alliance between Blue Cross and the hospitals.

In Chapter 4, "Blue Cross and the Cost of Hospital Services," the question of costs is examined. Reasonable cost reimbursement is discussed, and the development goes on to show that all costs turn out to be reasonable and allow-

able. The conclusion should come as no surprise: "The picture that emerges is one of total unaccountability."

In this same chapter, health maintenance organizations are discussed and given fair marks. Higher marks could easily be obtained with extensive government regulation of the quality of care, by effective consumer control of the HMO, or by effective competition and informed consumer choice concerning health care.

Chapter 5 deals with "Blue Cross Claims and Utilization Review." The premise is stated at the beginning of the chapter that the Blue Cross solution to the high cost of hospitalization lay in a process of denying claims in place of making attempts to control hospital unit costs.

The concluding chapter is no surprise. A Kennedy-Griffiths bill, even with its shortcomings, is advocated. A great deal of emphasis is placed on the benefits and difficulties of getting consumer advocates to participate in an effective manner at both the local and policy-making level. Such consumer representation is recommended, even recognizing that the costs would be higher, such costs being a worthwhile price for more responsive health services and the democratization of decision-making.

The concluding statement sets forth very nearly a summary of this book's purpose: "Examination of Blue Cross reveals not so much a system out of control as a system that is quite effectively designed to meet needs and interests that are not the needs and interests of those who use and pay for health services."

C. NORMAN PEACOR

Raymond Flower and Michael Wynn Jones, *Lloyd's of London: An Illustrated History*, pp. 192, Hastings House Publishers, New York, N.Y., 1974, \$15.00.

I do not believe it would be heresy to suggest that insurance literature is normally read rather cerebrally and usually not for pleasure. Well, this book is certainly a most pronounced exception, since it makes learning actually enjoyable. There are approximately three pages of illustrations for every page of text. These pictures certainly lend a good deal of authenticity to an era so long past.

The book opens with a very brief profile of the history of insurance as it evolved from the times of Hammurabi to the middle of the seventeenth century, when the introduction of coffee brought the first great leap forward and coffeehouses began to spread all over London—including Edward Lloyd's in 1687.

The text provides a vivid description of seventeenth-century London, the backdrop for the development of Edward Lloyd's coffeehouse. Also, a profile of Lloyd the man is refreshingly given, including a renowned graphologist's analysis of surviving samples of his handwriting. Throughout the book, choice excerpts are injected, which, in very few words, tell a great deal. For example, "a" coffeehouse is described along with its clientele (albeit with a point of view): "You may see a silly *Fop*, and a worshipful *Justice*, a griping *Rock*, and a grave

Citizen, a worthy *Lawyer*, and an errant *Pickpocket*, a Reverent *Nonconformist*, and a canting *Mountebank*; all blended together to compose an *Oglia* of Impertinence. . . . The room stinks of tobacco worse than Hell of Brimstone, and is as full of Smoak as their heads that frequent it, whose humours are as various as those of Bedlam, and their discourse of times as heathenish and as dull as their liquor."

The authors then describe the various evolutions of Lloyd's—its ownership, its physical plant through its various relocations, its response to an accommodation of marine war risks, its different forms of organization, and so on, until its modern-day posture.

Perhaps the most significant aspect of this book is the authors' successful embedding of the entire development of Lloyd's of London into its numerous contemporary social, economic, and political structures even through present-day Lloyd's. The authors have portrayed Lloyd's as a facet of life through the numerous generations it has survived.

Enough could not be said for the many, many, excellent illustrations, which add a great deal to the entire effort. This book is must reading for any student of the business who wishes to develop a deep, historical perspective of insurance, the business and its people!

C. K. KHURY*

A. M. Niessen, "Twelfth Actuarial Valuation of the Assets and Liabilities under the Railroad Retirement Acts as of December 31, 1971," pp. 195, U.S. Railroad Retirement Board, December, 1973.

This actuarial valuation report is truly a classic example of how such a report should be prepared and presented to the public, both interested actuaries and laymen. It puts to shame the type of actuarial reports that are generally put out for government employee and private employee pension plans by giving a wealth of data as to various assumptions used, results of alternative approaches, and year-by-year projections of income and outgo (rather than merely present-value balance sheets and level costs).

The report should be most interesting reading for persons concerned with social insurance in general and this financially distressed system in particular. It should be of interest also to those in the general pension field, if for no other reason than the wealth of data on mortality, disability, remarriage, withdrawal, and retirement rates and on salary scales and family composition.

The work on this valuation was started by James L. Cowen, A.S.A., when he was chief actuary of the Railroad Retirement Board. Upon Mr. Cowen's being named chairman of the Railroad Retirement Board, A. M. Niessen, A.S.A. (Mr. Cowen's predecessor as chief actuary), over and beyond the call of duty returned to the post and completed the task.

The valuation was made as of December 31, 1971, but it took into account

* Mr. Khury, not a member of the Society, is a Fellow of the Casualty Actuarial Society.

legislative changes through 1972. One of the difficulties in making these extensive valuations of the RR system is that the program just does not stand still long enough! The program is affected not only by RR amendments but also by social security amendments (because of a number of interlocking provisions, such as the maximum taxable wage base and the financial-interchange provisions).

Mr. Niessen made a valiant effort to keep the report up to date by inserting a section indicating the approximate over-all effects of significant RR legislation enacted on July 10, 1973, over President Nixon's veto, and SS legislation enacted on July 9, 1973. But this was, in part, in vain because that SS legislation was overridden by SS legislation enacted in the month that the report was issued. And then there has just been enacted, in October, 1974, further RR legislation, over President Ford's veto, that greatly affects the financial situation of RR. In fact, this legislation at long last puts RR in a position that is reasonably close to financial balance, in part by eliminating for future service the windfall benefits for those eligible for both RR and SS and in part at the expense of the General Fund of the Treasury, that is, the taxpayers of the country.

A serious problem facing Mr. Niessen was that of determining just what he was to value. For one thing, the RR benefits as they were in 1972-73 contained a "temporary" increase aggregating 52 per cent, which was supposed to expire at a near-future date. From a strictly legal standpoint, the valuation should be made on the basis of the law as it stands—that is, assuming that the temporary increase would really be so and that benefits would decrease at the expiration date—but this would almost certainly never eventuate. So one valuation, which was clearly labeled as being completely unrealistic, was made on this basis. It showed the regular benefits of the RR system (i.e., exclusive of the supplemental annuity benefits) as having an actuarial surplus of 2.5 per cent of taxable payroll on a level-cost basis.

For another thing, RR itself does not contain automatic-adjustment provisions to reflect changes in economic conditions, but SS does, and this significantly affects part of RR. So the decision was to make two additional valuations. One would be on the basis of completely static economic assumptions. The other would be on the basis of dynamic economic assumptions, with the further assumption that the law would be changed so that the RR benefit formula would be rationalized and then appropriately be made subject to automatic-adjustment provisions in the same general manner as is done under SS. Both of these valuations, as was the case in all previous ones, were prepared on an open-group basis (i.e., considering new entrants in the future) and over perpetuity. This reviewer believes that this is the proper approach for this type of program.

In considering the results of the valuation, the reader should bear in mind that, since October, 1973, the cost of the regular benefits of the RR system is no longer equally divided between employer and employee. Now the employee

pays only the SS rate, and the employer pays the balance of the scheduled total tax rate (in 1974, a total rate of 19.4 per cent, an employee rate of 4.95 per cent, and an employer rate of 14.45 per cent, all exclusive of the hospital insurance tax rate of 0.9 per cent on each party).

The static valuation of the regular benefits of the RR system showed a long-range actuarial deficit, on a level-cost basis, amounting to 6.85 per cent of taxable payroll using a 5.75 per cent interest rate and to almost 11 per cent of payroll at 3 per cent interest, which seems more appropriate for static conditions. The deficit based on 5.75 per cent interest was increased to 8.66 per cent by the July, 1973, legislation, and the level cost of the program then was 28.29 per cent of payroll. (The December, 1973, legislation resulted in the actuarial deficit increasing to 9.06 per cent of payroll; the October, 1974, legislation reduced the deficit to 0.96 per cent of payroll, as mentioned previously.)

The dynamic valuation of the regular benefits of the RR system, for a valuation period of seventy-five years rather than into perpetuity, showed a long-range actuarial deficit of about 5 per cent of taxable payroll under the assumption of wages increasing 5 per cent per year and prices increasing 2.75 per cent per year.

Under either the static or the dynamic valuations, the fund would be exhausted in 1981. Thereafter, current-cost tax rates for the employer and employee combined would have to be about 30 per cent in all future years for the static estimate and, for the dynamic estimate, about the same until 2000 and then 23 per cent. However, if the price-increase assumption in the latter were the alternative 3.50 per cent rate, the current-cost tax rate would average about 30 per cent over the next seventy-five years.

It is interesting to observe that, if the actuarial deficit were eliminated by a level tax-rate increase, financing problems would still remain, on a cash-flow basis. This situation arises because the annual costs rise to a peak in the 1980's and then decline (as a result of the age distribution of the RR covered population).

In considering the cost of the RR system, there must also be mentioned the cost of the supplemental annuity benefits, which are financed entirely by the employers on a cents-per-hour basis. These have a level cost equivalent to 1.87 per cent of taxable payroll.

There is only one point of adverse criticism of the report. It would have been quite helpful if some discussion and explanation had been given as to why some of the assumptions were changed so significantly between the previous valuation and this one (e.g., the disability incidence rates and the per cent eligible for the disability freeze).

ROBERT J. MYERS

1974 Reports of the Board of Trustees of the Social Security (OASDHI) Trust Funds.

In format and organization of material, the 1974 OASDHI reports are similar to those of previous years. There are three separate reports: one for

OASDI, or what is known as social security proper; another for the hospital insurance part of the Medicare program (HI); and the third for the medical insurance part of Medicare (SMI). Each of these documents gives a summary of new legislation, operational and fiscal highlights for fiscal year 1972-73, and the results of the latest actuarial estimates for the program in question. The actuarial sections include brief discussion of methodology and listings of the major assumptions used in the cost estimates.

From the point of view of program analysis and planning for the future, the most important parts of the reports are obviously those dealing with the actuarial aspects in general and with future costs in particular. In fact, the actuarial content is so predominant that the documents could be regarded as actuarial reports with everything else being only secondary. This is particularly true because the fiscal and statistical data contained in the reports are available from other official publications, whereas the cost estimates are usually the first published information on the latest appraisal of the actuarial condition of the program under consideration. The OASDHI annual reports have acquired a fine reputation for technical excellence, timeliness, and judicious selection of material. The social security actuaries, both past and present, deserve high praise for making the trustees' reports the fine actuarial documents they are.

Each of the three programs reported on is a giant in its own right, but OASDI overshadows the other two in every respect. During fiscal year 1972-73, OASDI outgo amounted to \$49.1 billion, while the corresponding figure for both Medicare programs came to only \$9.5 billion. Furthermore, most of the actuarial assumptions made for the OASDI program apply also to the Medicare programs. It seems, therefore, appropriate to devote most of this review to the actuarial cost estimates for OASDI. An added justification for the emphasis on OASDI is that the new assumptions and the emerging cost figures are materially different from those cited in last year's annual report.

THE NEW COST ESTIMATES FOR OASDI

According to the 1974 report, the average cost of the OASDI program for the seventy-five-year period 1974-2048 will be 13.89 per cent of taxable payroll. This is 2.50 percentage points above the previous estimate of 11.39 and 3.26 points above the 10.63 figure quoted in Trowbridge's paper on the 1969-72 social security amendments (*TSA*, XXV, 625-61). The difference between the original estimate for the dynamic system and the present one is thus 31 per cent relatively. In view of the fact that there have been no substantive changes in the program (the 11 per cent increase in benefits and the higher earnings base would have come through anyway although a little later), the step-up in the estimated cost may be regarded as extraordinary. This, in turn, calls for more than a cursory examination of the new assumptions that brought about the drastic change.

The analysis of the cost increase by source starts in the 1974 report with a deficit of 0.51 per cent of payroll, according to earlier cost figures, and breaks down the 2.47 (0.03 per cent of the increase in cost is due to moving the valua-

tion period one year in time) per cent increase as follows:

Retirement and disability rates . . .	0.35%
Economic assumption	0.19
Population assumptions	1.87
All other factors (net)	0.06

According to this breakdown, the ranking of the major causes of increase would be: population assumptions, retirement and disability rates, and economic assumptions. Your reviewer, however, thinks that the highest rank should be assigned to the economic assumptions, since their potential impact could be much greater than that of all other assumptions combined. Accordingly, the discussion that follows will begin with observations regarding the economic assumptions used in the latest cost estimates.

Economic Assumptions

The economic forecasts made in the past several decades have not earned high marks for accuracy and reliability. Judging by past performance, one is inclined to think of economics as an art rather than as a science. There is, therefore, no good reason to believe that the economic forecasts underlying the current OASDI cost estimates will turn out any better than have their predecessors. But since economic assumptions were necessary for the newly established dynamic mechanism of the social security program, prudence would indicate the use of conservative rather than liberal assumptions. In the opinion of this reviewer, the assumptions described in the 1974 OASDI report do not meet the requirements of even moderate conservatism. This opinion is shared by other students of social security, including R. J. Myers, the former chief actuary of the Social Security Administration.¹

The main issue here is the assumption that throughout the valuation period of seventy-five years there will be a 2 percentage point differential between the rate of increase in wages and that of prices. More specifically, the assumption is a 5 per cent annual rate for wages versus a 3 per cent rate for prices (higher rates were assumed for 1974-80). This is really not much of a change from the original assumption of 5 and 2.75 per cent, especially since the original estimates had a 0.375 per cent margin for all years through 2010. Let us see where a steady increase of 2 per cent per year in productivity would lead us. For one thing, this implies that by the end of the valuation period the standard of living will be some 325 per cent higher than today. What such an increase in consumption might do to our resources, environment, and job availability is too frightening to contemplate. Second, as pointed out by Mr. Myers, the assumption disregards the expected relative growth of the service and merchandising industries at the expense of the industries engaged in the production of goods. While productivity increases are likely in manufacturing, agriculture, and so forth, they are not equally likely in the other sectors of the economy. These considerations

¹ See *TSA*, XXV, 664.

seem to indicate that the main economic assumption used for the 1974 cost estimate is in all likelihood overly optimistic. However, it should be kept in mind that in the area of economic assumptions it is, as a practical matter, incumbent upon the actuary to be guided by the pronouncements of the professional economists, and this might be the reason for the economic assumptions being what they are.

To pursue this subject a little further, let us see what difference other economic assumptions would have made in the cost figures. It is clear that the social security actuaries were keenly aware of this problem, since the report quotes cost figures for several combinations of rates of increase in wages and prices. Under the essentially 5 and 3 combination used in the 1974 estimates, the average cost for the next seventy-five years would be 13.89 per cent of taxable payroll; under a 6 and 4 combination—15.20 per cent; and under a 5 and 4 combination the cost would skyrocket to 20.41 per cent. We can thus see that the potential effect of a large error in the economic assumptions is much more serious than an error in the population assumptions. An observation that may be to the point here is that the 1971 Advisory Council on Social Security had banned the presentation of alternative cost estimates. (This might have been the reason for alternative costs showing in the report in an indirect rather than a direct manner.) As long as the system remained formally static, there were, in the opinion of this reviewer, good reasons for single cost estimates, but with the advent of dynamism these reasons no longer prevail. The great vulnerability of all economic forecasts makes alternative cost estimates almost mandatory. It is hoped that the current Advisory Council will give this particular problem some thought.

The Population Assumptions

The population assumptions have undergone a drastic change, one that has caught the public eye as being chiefly responsible for the sharp increase of social security costs. While revisions have been made in several areas, the main change is a new and much lower fertility rate, which would in due time bring about a stationary population. More specifically, the 1974 estimates used a total fertility rate (average number of children per woman during her total childbearing period) of 2.1 as compared with a rate of about 2.5 used in the previous population projections. We shall not here discuss the changes at length, since the reader interested in particulars can find them in the SSA *Actuarial Studies No. 62* and *72*. The discussion that follows will be limited to pointing out the effects of different fertility rates on the age composition of the population and on costs.

The newest cost studies considered total fertility rates of 1.9, 2.1, and 2.3. The spread between average costs for the period 1974–2048 did not turn out to be particularly large, with the costs being 14.64, 13.89 (the central figure), and 13.27. However, when we consider individual years, the story is quite different. Thus, for the year 2045, we have costs of 19.91 for a 1.9 fertility rate, 17.86 for the central 2.1 rate, and 16.15 for the 2.3 rate. But it should be noted that even

this spread is not nearly as large as that found for a material change in the economic assumptions.

To show the extent of the changes in the population assumptions, we shall cite a few figures and ratios. Under the previous projections (*Actuarial Study No. 62*), the population total for the year 2045 emerged as 493 million; according to the newest projections (*Actuarial Study No. 72*), the corresponding figure is 317 million. The then-existing ratio of the aged to the total would be 0.120 under the previous projection and 0.158 under the new one. Additional comparisons are given in the accompanying tabulation. On the whole, the new population assumptions appear eminently reasonable in view of the knowledge available today. It will also be recalled that a substantial reduction in the fertility assumption would not have nearly the effect of assuming a narrow spread between wage and price increases in future years. Thus, it is rather strange that in most public utterances on the new cost estimates for social security the stress is placed on the new fertility assumption, with little being said about the potential effects of changes in wage and price patterns.

YEAR	PREVIOUS PROJECTION	NEW PROJECTION	NEW PROJECTIONS WITH TOTAL FERTILITY RATE	
			1.9	2.3
Total U. S. Population, Millions				
1975.....	228	223	223	223
2000.....	312	271	263	279
2025.....	410	305	280	332
2050.....	515	320	271	374
Population Aged 65 and Over as Per Cent of Total				
1975.....	9.7	10.3	10.3	10.3
2000.....	9.0	11.4	11.8	11.1
2025.....	12.0	15.7	17.1	14.4
2050.....	12.2	16.0	18.5	14.1
Population Aged 65 and Over as Per Cent of Population at Ages 20-64				
1975.....	18.3	18.8	18.8	18.8
2000.....	17.7	19.6	19.7	19.4
2025.....	21.8	27.7	29.5	26.1
2050.....	22.3	28.3	31.9	25.3

NOTE.—Previous projection figures are from SSA *Actuarial Study No. 62* and represent midpoints between the high and low estimates; the new projection figures are from SSA *Actuarial Study No. 72* for a total fertility rate of 2.1. The figures in the remaining two columns give an indication of the potentially strong effect of seemingly small variations in the fertility rate.

Other Assumptions

The report attributes a cost increase of 0.14 per cent of payroll to the use of higher retirement rates and 0.21 per cent to higher disability rates. As for the former, the main reason for the higher rates might be the proliferation of liberal early retirement provisions in industrial pension plans and the limited employment opportunities for people of middle and later age. In the area of disability benefits, social security has been under constant pressure from the courts to allow benefits in cases where according to the letter and intent of the law no such benefits should be allowed. It will be recalled in this connection that the 1967 amendments inserted language intended to prevent the courts from changing the statutory definition of disability (strictly permanent and total) into something much more liberal (occupational with regard to job availability for the claimant), but the effect of this legislative clarification has been much less than hoped for. An important factor here is that for some reason there have been very few appeals to higher courts against unduly liberal decisions; thus, the most liberal criterion applied by a certain judicial district in time becomes the standard for the program. That this is so can be seen from a comparison with disability rates experienced under the Railroad Retirement Act, which for most employees requires only occupational not total disability. With the passage of time, the difference between the two sets of rates has been getting smaller and smaller. According to the latest experience studies, some 75 per cent of railroad retirees presumably awarded annuities under the occupational definition of disability would have qualified medically also under the then-current social security standards.

The interest rate used in the latest OASDI estimates was 6 per cent. Ordinarily, the interest assumption is one of the most important assumptions in a valuation of a retirement system. However, since social security is being financed essentially on a pay-as-you-go basis, the interest assumption makes very little difference. As of June, 1974, the OASDI balance of \$46 billion was equivalent to but nine months of benefits, and, in the cost estimates, the "reserve" is limited to a contingency fund of one year's benefits. This most probably accounts for the quoting in the report of average costs (simple averaging of annual cost ratios) instead of equivalent level costs. In fact, it appears that even the concept of average costs should be relegated to a secondary position and that the main emphasis should be on the projected trend exhibited by the individual cost ratios. After all, if there is to be no prefunding, average costs over a long period of time have little practical meaning.

Projections of Beneficiaries and Benefits

According to the report, the number of OASDI beneficiaries will more than double during the valuation period, and the greatest relative increase will occur in the number of retired workers. For all classes of beneficiaries, the number at the end of the period will be 66.7 million versus 30.4 at the beginning, and for retired workers, the corresponding numbers are 48.3 million versus 16.8 million, respectively. But as large as the expected increases in the numbers of

beneficiaries are, they are minuscule in comparison with the projected increases in benefit amounts. This is understandable in view of the dynamic factors on which these projections are based.

According to the new estimates, by the year 2045, OASDI benefit payments will be \$5.6 trillion, over 100 times as much as the expected outgo during 1974. The average retirement benefit awarded will by the year 2045 be \$8,174 per month, 44 times as large as the average of \$185 for 1974. While increases of that magnitude are possible, at the present time they appear wholly incredible. The true meaning of the projected benefit figures would have been enhanced by translating them through the consumer price index into 1974 dollars. Thus, for example, the \$8,174 benefit referred to previously would be about \$960 in terms of 1974 dollars, indicating more than a 400 per cent increase in the benefit's purchasing power. The authors of the report were undoubtedly aware of this problem since they show ratios of increase in benefits to increase in wages. These ratios are truly remarkable in that they call attention to the fact that, under the existing dynamic provisions, benefits will grow even faster than wages, thus exceeding the criterion of keeping up with the standard of living. Unless the object is to have social security attain higher and higher levels in terms of income replacement, the dynamic provisions would have to be materially changed. This should be one of the prime concerns of the present Advisory Council on Social Security.

THE MEDICARE REPORTS

The Medicare programs are discussed in two separate reports, one for HI and the other for SMI. From the point of view of actuarial content, the first is much more interesting, since it includes projections (and average costs) for the next twenty-five years; by comparison, the SMI report goes no further than calendar year 1976. The news conveyed by the HI report is good in the sense that it shows a tiny actuarial surplus (0.02 per cent of payroll) rather than a deficit. Here too, one might question the practical significance of average cost figures, since the projected figure for 1995 is more than double the 1974 figure (3.45 versus 1.63—the cost would be much higher after the turn of the century because of the aging of the population and the fast increase in the number of disabled beneficiaries). The emphasis on average cost figures would tend to obscure the true significance of what seems to lie ahead in the way of paying for social security.

In terms of unadjusted dollar amounts, per capita hospital costs are expected to increase much faster than either prices or wages. More specifically, the percentage increases quoted in the report are 9.6 for 1974, 12.6 for 1975, 11.0 for 1980, and 8.0 for 1985-95. By comparison, the assumed rate of increase in wages is 5 per cent for all years after 1981 and in prices, 3 per cent. For years prior to 1981, the highest wage increase quoted is 8.5 per cent.

The SMI report is particularly noteworthy for the excellent discussions of past experience and for the wealth of statistical material it presents. Benefit payments for 1974 are estimated at \$138.36 on a per capita basis and the cor-

responding projected figures (all for aged beneficiaries only) are \$156.14 for 1975 and \$175.99 for 1976. Administrative expenses would add 13 per cent to these figures; thus, it appears that next year the SMI per capita cost will be about 15 per cent above today's cost.

CONCLUDING REMARKS

The 1974 OASDHI reports are extremely important and interesting sources of information on what has happened in the area of social security in the past and what might happen in the future under present program provisions. The intelligent reader will find in these reports everything he needs to know about the subject. However, due to the nature and purpose of these reports, they could not include all the tables, factors, and other relevant material that inquisitive actuaries who are interested in social security would like to have. This could be remedied by the publication of a technical supplement, and it is hoped that the social security actuaries will find the time for this.

Past experience has taught us that social security tax schedules should not be taken too seriously beyond the first several years. This brings into question the whole idea of pronouncing a given set of provisions actuarially sound because the level- or average-cost figure is approximately the same as the average tax rate for the valuation period. As indicated earlier in this review, the analysis of future events should be based on a close examination of the projected cost figures for successive short periods of time (say, five-year periods), rather than on long-term averages. It is realized, of course, that a change along such lines would have to come from outside the Social Security Administration, and it is hoped that the outstanding actuarial group now working with the Advisory Council will give this matter some consideration.

There have been suggestions for shortening the valuation period for OASDI to, say, twenty-five years and for HI to, say, ten or five years. In the opinion of this writer, such a change would not be wise because it would conceal from public view the substantial cost increases that are expected to occur in later years. A short valuation period could result in setting benefit levels to a cost figure that appears acceptable. But once benefit levels are set, it is practically impossible to lower them, and this would of necessity bring about later costs beyond the point of either reasonableness or acceptability. If anything, longer valuation periods might be desirable, with the understanding that no particular attention will be paid to average- or level-cost figures for the whole period.

All in all, the 1974 reports have performed an extremely important public service in that they clearly indicate that the era of rapid social security expansion may be coming to a close. From now on, responsible policy-makers will have to be much more careful about "improving" social security than has been the case in the past. It is gratifying to see that the news media have picked up the somber tone of the OASDI report and are giving the public realistic appraisals of what may lie ahead for the social security system.

A. M. NIESSEN

I. Pfeffer and D. Kloch, *Perspectives on Insurance*, pp. 501, Prentice-Hall, Englewood, N.J., 1974.

Professors Pfeffer and Kloch present, in textbook form, seven perspectives of insurance (historical, legal, psychological, economic, actuarial, managerial, and consumerist). That so much interesting material on so many diverse topics—all of which are important and timely to our industry—can be found in one book should be most helpful.

The scope of the subject matter necessarily limits the depth to which the authors explore each perspective. Life-health, property-liability, and social insurance, for example, are examined together. The material presented is of value and interest and very current. Review and study questions follow each chapter. The reviewer wonders whether the inclusion of one more perspective on distribution of marketing might not have been appropriate.

The authors briefly trace insurance development over the centuries. That the insurance idea took form so long ago (Code of Hammurabi, laws governing Hanseatic League) should be of comfort to us in these current troubled times.

Legal perspective describes life-health and property-liability contract benefits and provisions. General legal, agency, and corporate law are briefly covered. An excellent chapter on the insurance commissioner and public policy is new to most insurance texts.

A brief chapter on the psychological perspective shows that fear, anxiety, degrees of disbelief, and doubt exist for most of us and that insurance provides some relief for these pains. Risk-management techniques and behavioral patterns are briefly discussed.

The reviewer found the economic perspectives to be particularly useful and timely. The structure of the insurance industry and competition (price, non-price, and defensive) are creditably presented. Insurance is examined both with micro- and macroeconomic techniques. The role of insurance in the world economy contains facts and data not usually in print.

Basics of actuarial theory are simply but adequately presented. The five major areas of actuarial weakness claimed by the author are (1) need for more refined data, (2) deficiency of comprehensive or aggregate statistics, (3) effects of adverse selection on data studied are not measured, (4) creditability criteria are not adequately measured, and (5) no suitable theory for determining appropriate retention limit or capacity level.

Modern management theory and practices are briefly surveyed. Quantitative measures of an insurance company's performance are given; also given are certain scientific management methods (simulation models, operations research techniques, and use of behavioral sciences).

As part of consumerist perspectives the authors include social insurance, corporate risk management, and estate planning. Current consumerist developments in insurance (federal health proposals, the automobile insurance problem, and life insurance cost measures) is the most important part of this perspective and is discussed rather thoroughly.

CARLTON HARKER

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—"Health Insurance"; 3—"Social Security"; 4—"Other Topics."

ACTUARIAL AND OTHER MATHEMATICS, STATISTICS, AND GRADUATION

U.S. National Center for Health Statistics, *United States Life Tables by Dentulous or Edentulous Condition, 1971 and 1957-58*, pp. 18, Data Evaluation and Methods Research, Series 2, No. 64, Rockville, Md., August, 1974.

Numbers of survivors by age, sex, and dentulous or edentulous condition, and average remaining lifetime by age and sex, classified by dentulous and edentulous years. Based on data collected in household interviews in 1971 and 1957-58.

U.S. National Center for Health Statistics, *Mortality Trends for Leading Causes of Death, United States—1950-69*, pp. 75, Data from the National Vital Statistics System, Series 20, No. 16, Rockville, Md., March, 1974.

A study of the trends during 1950-69 for the fifteen leading causes of death, which accounted for 89 per cent of the 1,921,990 deaths occurring in the United States in 1969.

HEALTH INSURANCE

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

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

U.S. National Center for Health Statistics, *National Ambulatory Medical Care Survey: Background and Methodology, United States—1967-72*, pp. 76, Data Evaluation and Methods Research, Series 2, No. 61, Rockville, Md., April, 1974.

A report on feasibility studies of methods developed for collecting national ambulatory medical care data from practicing, office-based physicians in the United States, 1967-72, prepared for the Division of Health Resources Statistics, National Center for Health Statistics, Health Resources Administration, U.S. Department of Health, Education, and Welfare.

U.S. National Center for Health Statistics, *The National Ambulatory Medical Care Survey: Symptom Classification*, pp. 35, Data Evaluation and Methods Research, Series 2, No. 63, Rockville, Md., May, 1974.

Methodology for classifying patients' symptoms, complaints, problems, and reasons for seeking ambulatory medical care. Developed for use in the National Ambulatory Medical Care Survey.

U.S. National Center for Health Statistics, *Ambulatory Medical Care Records: Uniform Minimum Basic Data Set—a Report of the United States National Committee on Vital and Health Statistics*, pp. 16, Documents and Committee Reports, Series 4, No. 16, Rockville, Md., August, 1974.

This report has been prepared by a group of consultants on ambulatory medical care records, under the auspices of the U.S. National Committee on Vital and Health Statistics. It sets forth and defines the minimum set of items of information that should be entered uniformly in the records of all ambulatory medical care, regardless of the setting in which the care is delivered. It also specifies classifications of the information that would be recorded for most of the items in the set.

U.S. National Center for Health Statistics, *Health Characteristics by Geographic Region, Large Metropolitan Areas, and Other Places of Residence, United States—1969-70*, pp. 56, Data from the National Health Survey, Series 10, No. 86, Rockville, Md., January, 1974.

Statistics on chronic activity limitation, disability days, persons injured, acute conditions, short-stay hospital discharges, and physician and dental visits by geographic region, large metropolitan area, and other places of residence. Based on data collected in health interviews during 1969 and 1970.

U.S. National Center for Health Statistics, *Disability Days, United States, 1971*, pp. 64, Data from the National Health Survey, Series 10, No. 90, Rockville, Md., June, 1974.

Statistics on volume of days of restricted activity and bed disability and days lost from work and school, by age, sex, place of residence, family income, color, usual activity status, employment status, industry, and occupation. Based on data collected in household interviews during 1971.

U.S. National Center for Health Statistics, *Personal Out-of-Pocket Health Expenses, United States, 1970*, pp. 60, Data from the National Health Survey, Series 10, No. 91, Rockville, Md., June, 1974.

Statistics on the proportion of persons with no out-of-pocket health expenses, those with expense by selected expense intervals, and per capita annual expense by age, sex, family income, education of head of family, color, place of residence, and geographic region. Based on data collected by self-enumeration or personal interview during 1971.

U.S. National Center for Health Statistics, *Measures of Chronic Illness among Residents of Nursing and Personal Care Homes, United States, June-August 1969*, pp. 65, Data from the National Health Survey, Series 12, No. 24, Rockville, Md., March, 1974.

Statistics on number of chronic conditions and impairments, mobility status, primary type of service, level of patient care, and number and types of special aids used. Comparisons made with data collected in May-June, 1964. Based on data collected from a national survey of institutions during the period June-August, 1969.

U.S. National Center for Health Statistics, *Patient Charges in Short-Stay Hospitals, United States—1968-1970*, pp. 41, Data from the National Health Survey, Series 13, No. 15, Rockville, Md., May, 1974.

Statistics are presented on the utilization of short-stay, nonfederal hospitals based on data collected in the Hospital Discharge Survey from a national sample of hospital

records of discharged patients. Number of discharges, total charges, average charge per episode of hospitalization, and average charge per day of hospitalization are presented by sex and age of patient, geographic region, bed size of hospital, and type of hospital service. Average charge per day of hospitalization is also presented by length of stay of patient.

U.S. National Center for Health Statistics, *Inpatient Utilization of Short-Stay Hospitals by Diagnosis, United States—1971*, pp. 71, Data from the National Health Survey, Series 13, No. 16, Rockville, Md., July, 1974.

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

U.S. National Center for Health Statistics, *Utilization of Short-Stay Hospitals, Summary of Nonmedical Statistics, United States—1971*, pp. 41, Data from the National Health Survey, Series 13, No. 17, Rockville, Md., August, 1974.

Statistics are presented on the utilization of short-stay hospitals based on data collected in the Hospital Discharge Survey from a national sample of hospital records of discharged patients. Discharges, days of care, and average length of stay are distributed by each of the variables age, sex, and color of patient and by geographic region, bed size, and type of ownership (control) of hospital.

U.S. National Center for Health Statistics, *Podiatry Manpower: Characteristics of Clinical Practice, United States—1970*, pp. 72, Data on National Health Resources, Series 14, No. 11, Rockville, Md., March, 1974.

From information collected in a national survey of podiatrists conducted by the National Center for Health Statistics, statistics are presented describing the clinical practice of podiatry in the United States in 1970. Patient-care activity is described in terms of its volume and its nature. Indicators of volume are number of hours per week spent in patient care, number of patient visits, actual number of patients seen a week, and number of full-time and part-time helpers employed. Indicators of the nature of clinical activity are the practitioner's primary and secondary clinical specialties, range and types of clinical services rendered, and clinical setting (such as office, hospital, and nursing home) in which services were rendered.

U.S. National Center for Health Statistics, *Inpatient Health Facilities as Reported from the 1971 MFI Survey*, pp. 65, Data on National Health Resources, Series 14, No. 12, Rockville, Md., March, 1974.

Statistics about nursing homes, hospitals, and other kinds of inpatient health facilities include numbers of institutions, beds, and employees as well as types of ownership, geographic distribution, and comparisons with other surveys. Based on data collected during the period August–October, 1971.

U.S. National Center for Health Statistics, *Optometric Manpower: Characteristics of Optometric Practice, United States—1968*, pp. 81, Data on National Health Resources, Series 14, No. 13, Rockville, Md., June, 1974.

From information collected in a national survey of optometrists conducted by the National Center for Health Statistics, statistics are presented describing features of optometric practice in the United States in 1968. These features include the form and composition of practice arrangements, primary and secondary activities of the practitioners, the range of services that practitioners provided, and the numbers and types of supplementary personnel that the optometrist used to assist him in his practice.

U.S. National Center for Health Statistics, *Characteristics of Patients Treated by Podiatrists, United States—1970*, pp. 31, Data on National Health Resources, Series 14, No. 14, Rockville, Md., August, 1974.

From information collected in a national survey of podiatrists conducted by the National Center for Health Statistics in 1970, statistics are presented on patients treated by podiatrists in the course of one week. Patients are statistically described in terms of their sex, age, and geographic distribution; by selected professional characteristics of the podiatrists who treated them; and by the clinical setting where they were treated, for example, private office, nursing home, patient's home, hospital, or nonhospital clinic.

SOCIAL SECURITY

Erwin S. Janush, *Occupational Differences in Separation Rates of Railroad Workers, 1968-71*, pp. 43, Actuarial Study No. 11, U.S. Railroad Retirement Board, Chicago, Ill., September, 1974.

This study is a sequel to four previous studies on the same subject covering prior periods. Data by occupational group are presented for active employees as well as new entrants, dealing with deaths in active service, nondisability and disability retirements, and withdrawals. Data for all retirements (disability and nondisability) were obtained from a universe count, while data from all other categories of separations were obtained from 4 per cent samples.

Active census.—An active employee is defined as one who worked some time during a particular calendar year and who is alive and not retired at the end of that year. This definition constitutes an overstatement of the number of employees who were working at the end of the year, because it includes those who have withdrawn from the industry in the particular calendar year. Employment in all occupations combined as well as employment in most of the specific occupational groups have continued to decline, with the greatest decreases in the occupations requiring the least skill. Railroad employees are older on the average than the male labor force in the United States. The 1971 median ages for the two groups are 46 and 36 respectively.

New entrants.—After declining in prior years, this group increased from 1968 to 1970 but again decreased in 1971. Preliminary data indicate further declines in 1972 and 1973. The increases in 1968-70 occurred because of the accelerated hiring to offset the accelerated retirements resulting from the enactment of the supplemental annuity program in 1966. Many of the new entrants, who are temporary or part-time employees filling unskilled jobs, should not be included in the study; however, it was not possible to isolate the data pertaining to them.

Active service mortality.—A death in active service is one that takes place in the calendar year in which the employee last worked or in the year immediately following.

The study is restricted to employees with ten or more years of service because this service requirement is necessary for the payment of survivor benefits by the Railroad Retirement Board. Since there are wide differences in the age distributions among the various occupational groups, the mortality rates by occupational group were age-adjusted. Mortality ratios were also calculated, with the standard mortality used being the 1965-68 age-specific death rates for all railroad employees. An apparently surprising result is that the lowest economic groups experienced low rates of mortality in active service. However, it should be observed that the disability rates for these groups are the highest.

Nondisability retirement rates.—This study is concerned with immediate retirement, which includes those who last worked in the calendar year of retirement or in the preceding year. Retirement rates have increased significantly since the previous study because of the introduction of the supplemental annuity program. The highest rates occur at ages 65 and 70, but rates for ages under 65 have been increasing steadily because of recent benefit increases.

Disability retirement rates.—Two types of disability benefits are available under the railroad retirement system—total and permanent disability and occupational disability. For the latter, the employee must have twenty years of service or be aged 60 or over. Studies by category of disability for employees with twenty or more years of service would not be meaningful, since the practice of the board is to award an occupational disability benefit whenever possible. The over-all disability rates by occupation, which were age-adjusted, have increased since the previous study.

Withdrawal rates.—Studies were conducted with respect to employees with less than ten and more than fifteen years of service. For the former, the studies for each occupational group were done by duration only. The highest withdrawal rates were among the least-skilled employees, with substantial numbers withdrawing in the calendar year of entry. Part-time and temporary employees were included in this group.

OTHER TOPICS

U.S. National Center for Health Statistics, *Language and Adjustment Scales for the Thematic Apperception Test for Children 6-11 Years*, pp. 70, Data Evaluation and Methods Research, Series 2, No. 58, Rockville, Md., December, 1973.

U.S. National Center for Health Statistics, *The Rationale, Development, and Standardization of a Basic Word Vocabulary Test*, pp. 71, Data Evaluation and Methods Research, Series 2, No. 60, Rockville, Md., April, 1974.

U.S. National Center for Health Statistics, *An Assessment of the Occlusion of the Teeth of Children 6-11 Years, United States*, pp. 52, Data from the National Health Survey, Series 11, No. 130, Rockville, Md., November, 1973.

U.S. National Center for Health Statistics, *Skinfold Thickness of Youths 12-17 Years, United States*, pp. 68, Data from the National Health Survey, Series 11, No. 132, Rockville, Md., January, 1974.

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