

ABOUT THE AUTHORS



A. Stephen Beach, A.S.A. 1988, graduated from The Ohio State University with a B.A. degree in mathematics and actuarial science. Immediately thereafter, he began his actuarial career with Allstate Life Insurance in the area of group pension valuation. In October 1987, he transferred to the North American Company for Life and Health Insurance, where he was active in individual product development. In November 1989, Mr. Beach returned to Allstate Life, where his primary interests are in capital management and assurance of solvency. He is now working toward his F.S.A. on the individual life and annuity track.



John H. Cook, F.S.A. 1963, was employed by Metropolitan Life Insurance Company for 43 years until his retirement in 1982. He participated in committee activities of the Life Office Management Association, the American Council of Life Insurance, the Home Office Life Underwriters Association, and the Association of Life Insurance Medical Directors of America. During his last seven years with Metropolitan he served on the Ordinary Mortality Committee of the Society of Actuaries, the last three of those years as its chairperson. Since his retirement, Mr. Cook has returned to his first love, teaching mathematics; most recently he has been teaching statistics at the County College of Morris in New Jersey.



Michael V. Eckman, F.S.A. 1976, received a bachelor's degree in mathematics from the University of Minnesota. His first actuarial position was as an actuarial student for Equitable Life Assurance Society (1969-70); then he joined Lincoln National Life Insurance Co. (1971-81). He is currently assistant vice president and tax actuary at Northwestern National Life Insurance. Mr. Eckman is a member of the American Academy of Actuaries and has served on the Society's Part 5 Examination Committee and as an Education General Officer of the Education and Examination Committee. His paper "A Policy Year Model for GAAP Valuation Coinsurance and Modified Coinsurance," co-authored with David N. Becker, appeared in Volume XXXIII (1981) of the *Transactions*.



Edward W. (Jed) Frees, F.S.A. 1986, is an associate professor of business and statistics at the University of Wisconsin-Madison and in 1989 was a visiting mathematical statistician at the U.S. Bureau of the Census. He received a Ph.D. in mathematical statistics in 1983 from the University of North Carolina at Chapel Hill. Prior to being at Chapel Hill, he was employed by M & R Services, John Eriksen and Partner's (a New Zealand actuarial consulting firm), and the United Kingdom's Government Actuaries Department. For the Society, he is past chairperson of the Committee on Relations with Statistical Societies and currently a member of the Education Policy Committee, the Society liaison to the American Statistical Association, academic instructor and chairperson for the Society's new intensive seminar on applied statistical methods (Course 121), and Council member of the Education and Research Section. Research interests include stochastic models of insurance and finance and statistical inference. His paper "Net Premiums in Stochastic Life Contingencies" appeared in Volume XL (1988) of the *Transactions*. Dr. Frees has also published papers in *Insurance: Mathematics and Economics*, *Journal of Finance*, *Journal of Business and Economics*, *Annals of Statistics*, *Journal of the American Statistical Association*, *Journal of Insurance Issues and Practices*, *Journal of Statistical Planning and Inference*, *Sankhya*, *Stochastic Processes and Their Applications*, *Sequential Analysis*, *Naval Research Logistics Quarterly*, *ASTIN Bulletin*, *Management Science*, and *Scandinavian Journal of Statistics*.



Randolph M. Friend, F.S.A. 1983, received a B.S. and an M.A. in mathematics from the University of Nebraska-Lincoln and also attended the program in actuarial science there. His first actuarial position was with Capital Holding Corporation (1976-83); then he was a consulting actuary at Lewis & Ellis, Inc. (1983-85) and, following that, vice president and actuary at JTVA, Inc. (1985-90). He is currently a consulting actuary at William M. Mercer, Inc., in Dallas. He is an enrolled actuary and a member of the American Academy of Actuaries.



Roy Goldman, F.S.A. 1980, received a bachelor's degree cum laude from Franklin and Marshall College and a Ph.D. in mathematics from Rutgers University. From 1974 through 1977, he taught at the University of Pernambuco in Recife, Brazil and at Rutgers University; from 1977 through 1978, he was an assistant actuary for a pension consulting firm. Since 1978, he has been with the Prudential Insurance Company of America and is currently chief financial officer of Prudential's group business unit. For the Society, Dr. Goldman has served on the Examination Committees on Life Contingencies, Risk Theory, and Interest Theory (chairperson, 1983-85), on the F.E.M. (Future Educational Methods) Implementation Task Force, and on the Task Force on Education for the Actuary of the Future. He is currently the Examination Chairperson of the Education and Examination Committee. He is a member of the American Academy of Actuaries and served on the NAIC Special Advisory Task Force on Standard Valuation Law and the Health Reserve Subgroup of the ACLI Section 807 Task Force. His paper in this volume of the *Transactions*, "Pricing and Underwriting of Group Disability Income Coverages," received the L. Ronald Hill Memorial Prize for the best paper on employee benefit plans in 1990.



Mark W. Griffin, F.S.A. 1983, is a vice president of Morgan Stanley & Co. Inc., where he is involved in the development and implementation of investment strategy and asset/liability management for insurance companies. He is a regular contributor to Society and industry meetings and has authored a number of Section newsletter articles. He is a member of the Investment Section Council. Griffin received a B. Math at the University of Waterloo and is a chartered financial analyst.



James B. Keller, F.S.A. 1986, is the individual life reinsurance actuary and an assistant vice president at Lincoln National Life, a company he joined in 1983 after working at Capital Holding for two years. He received a B.A. degree, summa cum laude, in mathematics and economics from Indiana University in 1981. Mr. Keller has been serving on the Risk Classification Committee of the American Academy of Actuaries since 1988. He was a panelist at the SOA 1988 AIDS symposium and a 1988 Spring Meeting. Published articles include "Mortality Expectations Based on HIV-Infection Status at Time of Underwriting" (*Product Development News*) and "HIV Infection: New Business Mortality Expectations" (*Product Development News* and *Reinsurance Section News*).



Rama Kocherlakota, not a member of the Society, is a National Science Foundation postdoctoral fellow and an adjunct assistant professor at the University of California Berkeley. He holds a bachelor's degree from Princeton and a doctorate from Harvard, both in mathematics. He worked for several summers at the Great-West Life Assurance Co. in Winnipeg, supplementing his education with stimuli from the real world of business. His article, "Algorithms for Cash-Flow Matching," co-authored with E. S. Rosenbloom and Elias S. W. Shiu, appeared in Volume XL (1988) of the *Transactions*.



Ernest J. (Jack) Moorhead, F.S.A. 1938 and A.I.A., began his actuarial career at Great-West Life in 1929; from 1945 until 1948, he was with a predecessor of the Life Insurance Marketing and Research Association (LIMRA, at that time LISRB and then LIAMA); from 1948 to 1952, at United States Life in New York City; from 1952 to 1967, at New England Mutual Life; and from 1967 until his retirement in 1972, at Integon in Winston-Salem, N.C. Since 1972 he has participated in public interest activities, including advisory work for the U.S. Senate Subcommittee on Antitrust and Monopoly and two studies of the financial problems of the Social Security system. He served the Society of Actuaries as chairperson of the Committee on Papers, president (1969-70), and editor of *The Actuary* and is currently chairperson of the Committee on Memorials. He served the

American Academy of Actuaries as president (1973–74). He is the author of *Our Yesterdays: the History of the Actuarial Profession in North America, 1809–1979*, which was published by the Society as part of the profession's Centennial Celebration in 1989. He has published several papers, discussions and book reviews in the *Transactions*, including "The Construction of Persistency Tables" (XII, 1960), "Mortality Investigation with Expected Mortality Estimated at Issue by Use of Persistency Factors (XIII, 1961), "Valuation of Nonvested Renewal Commissions" (XV, 1963), "Report on the Forthcoming Sequel to the 1966–67 Future Outlook Study of the Institute of Life Insurance (XXIV, 1972), "Unresolved OASDI Decoupling Issue," with C. L. Trowbridge (XXIX, 1977), and "Sketches of Early North American Actuaries" (XXXVI, 1984).



Robert J. Myers, F.S.A. 1940 and A.I.A., served in various actuarial positions with the U.S. Social Security Administration from 1934 until 1970, including chief actuary (1947–70). Since then he has been a member of the National Commission on Social Security (1978–81), Deputy Commissioner of Social Security (1981–82), executive director of the National Commission on Social Security Reform (1982–83), and chairman of the Railroad Unemployment Compensation Committee (1983–

85). He is currently chairman of the Commission on Railroad Retirement Reform. He also has been an actuarial consultant to various Congressional Committees and the Federal Judiciary and a member of missions of technical assistance in connection with Social Security or pension programs in many foreign countries. He was President of the Society of Actuaries and President of the American Academy of Actuaries in 1971–72. He is a Fellow of the Casualty Actuarial Society, the Conference of Actuaries in Public Practice, the American Statistical Association, the American Association for the Advancement of Science, and the Royal Statistical Society. His numerous awards include the Triennial Prize from the Actuarial Society of America and the Distinguished Service Award from the U.S. Department of Health, Education, and Welfare. Mr. Myers is the author of several books, including *Social Insurance and Allied Government Programs* (Richard D. Irwin, Inc., 1965), *Medicare* (Irwin, 1970), *Social Security* (Irwin, 1st ed., 1975; 2nd ed., 1981; 3rd ed., 1985), and *Indexation of Pension and Other Benefits* (Irwin, 1978). He has published 775 papers in technical and scientific journals, of which 32 have appeared in the *Transactions*, the *Transactions of the Actuarial*

Society of America, and the *Record of the American Institute of Actuaries*; about 500 discussions, book reviews, and letters to the editor; and 135 testimonies before Congressional Committees and advisory groups.



Colin M. Ramsay, A.S.A. 1984, is an assistant professor of actuarial science at the University of Nebraska-Lincoln. He obtained his B.Sc. degree in actuarial science from the City University, London, England, in 1979 and his M. Math and Ph.D. degrees in statistics from the University of Waterloo, Ontario, Canada, in 1980 and 1984, respectively. His research interests include ruin theory, the impact of AIDS on insurance, and the adequacy of pension funding levels. Dr. Ramsay's papers have appeared in *Journal of Risk and Insurance*, *Journal of the Institute of Actuaries*, *ASTIN Bulletin*, *Insurance: Mathematics and Economics*, and *Scandinavian Actuarial Journal*. His paper "AIDS and the Calculation of Life Insurance Functions" appeared in Volume XLI (1989) of the *Transactions* and another paper, "Adjusted Moving-Weighted-Average Graduation," will appear in Volume XLIII (1991).



Alfred Raws, III, F.S.A. 1976, is assistant vice president and actuary with CIGNA's Property & Casualty Group. He received a B.S. in mathematics from Trinity College in 1967 and an M.S. in mathematics from the University of Michigan in 1968. After several years with the National Security Agency, Mr. Raws has been employed as an actuary since 1973. He has held positions with National Liberty Corporation, Continental American Life Insurance Company, Price Waterhouse, and NRG America Life Reassurance Corporation. He is an associate of the Casualty Actuarial Society, an enrolled actuary and a member of the American Academy of Actuaries. For the Society of Actuaries, he has served on the Part 5 Examination Committee, being vice-chairperson for the risk theory topic. Mr. Raws has written several discussions on articles that have appeared in the *Transactions* and has had an article published in the *Lawyer's Digest*.



Robert R. Reitano, F.S.A. 1980, received a B.A. and an M.A. in mathematics from the University of Massachusetts and a Ph.D., also in mathematics, from the Massachusetts Institute of Technology. He is senior financial officer and director of research in investment policy and research at John Hancock Mutual Life Insurance. He has been an assistant professor at the University of Massachusetts, a visiting scholar at M.I.T., an instructor of a risk theory seminar for the Society of Actuaries, moderator of a panel discussion on Funding for Investment Risk at the 1990 Annual Meeting, and a member of the Investment Course Content Committee. Currently he is an instructor for the Actuaries Club of Boston and is presenting three seminars on Multivariate Duration Analysis for the Society. Dr. Reitano is a member of the American Academy of Actuaries, the Mathematical Association of America, and Sigma Xi. He has published papers in *Actuarial Research Clearing House*, *Journal of Portfolio Management*, and the *Transactions* ("Mortality Cost Valuation of Underwriting Requirements," Vol. XXXIV, 1982, and "Multivariate Duration Analysis" and "Multivariate Immunization Theory," Vol. XLIII, 1991).

Dr. Reitano is a member of the American Academy of Actuaries, the Mathematical Association of America, and Sigma Xi. He has published papers in *Actuarial Research Clearing House*, *Journal of Portfolio Management*, and the *Transactions* ("Mortality Cost Valuation of Underwriting Requirements," Vol. XXXIV, 1982, and "Multivariate Duration Analysis" and "Multivariate Immunization Theory," Vol. XLIII, 1991).



E. S. Rosenbloom, not a member of the Society, is an associate professor in the department of actuarial and management sciences at the University of Manitoba. He obtained a B.Sc. (Hons) degree in mathematics in 1970 and a M.Sc. degree in mathematics from the University of Manitoba in 1971. He obtained a Ph.D. in operational research from the University of Waterloo in 1976. Before joining the University of Manitoba, Dr. Rosenbloom taught at the University of Lethbridge and at the University of Alberta. His research interests include manpower scheduling and operational research models in finance. Dr. Rosenbloom has published in *Cahiers du Centre d'Études de Recherche Opérationnelle*, *Congressus Numerantium*, *European Journal of Operational Research*, *Managerial Finance*, and *Mathematics of Computation*. His paper "Algorithms for Cash-Flow Matching," with Rama Kocherlakota and Elias S. W. Shiu, was published in Volume XLI (1989) of the *Transactions*.

Dr. Rosenbloom has published in *Cahiers du Centre d'Études de Recherche Opérationnelle*, *Congressus Numerantium*, *European Journal of Operational Research*, *Managerial Finance*, and *Mathematics of Computation*. His paper "Algorithms for Cash-Flow Matching," with Rama Kocherlakota and Elias S. W. Shiu, was published in Volume XLI (1989) of the *Transactions*.



Bruce D. Schobel, F.S.A. 1976, is actuary in the tax department of New York Life Insurance Co., which he joined in June 1990. Before that, he was a principal in the Louisville, Kentucky office of William M. Mercer, Inc. In 1979-88, he was with the U.S. Social Security Administration in various actuarial and policy development positions, including staff actuary to the National Commission on Social Security Reform. His first actuarial position was with the Prudential Insurance Co.

Schobel earned a B.S. in mathematics from the Massachusetts Institute of Technology in 1974. He is a member of the American Academy of Actuaries, a Fellow of the Conference of Actuaries in Public Practice, a Chartered Life Underwriter, and a Certified Employee Benefit Specialist. Mr. Schobel's paper "Money's-Worth Analysis of Social Security Retirement Benefits," co-authored with Robert J. Myers, was published in Volume XXXV (1983) of the *Transactions*; his paper "Social Security Considerations in Transfers to and from the United States," published in *Benefits & Compensation International*, April 1989, became a Society of Actuaries Study Note in 1991; and he has also published articles in *The Wall Street Journal*, *Journal of Taxation*, *The Actuary*, and *Contingencies*.



Eric S. Seah, F.S.A. 1984 and F.C.I.A. 1985, is associate professor of actuarial science at the University of Manitoba. Before joining the University of Manitoba, he was associated with the Great-West Life Assurance Company in Winnipeg. He received a B.Sc. in 1979, an M.Sc. in 1981 and a Ph.D. in 1987, all from the department of computer science at the University of Manitoba. He now serves on the Education and Examination Committee of the Society. Dr. Seah's research interests

include combinatorial designs, applications of expert systems in financial industry, and computer applications in actuarial science.



Elias S. W. Shiu, A.S.A. 1977, is a professor in the department of actuarial and management sciences at the University of Manitoba. He obtained a B.Sc. (Hons) degree and an M.Sc. degree from the University of Manitoba in 1971 and a Ph.D. degree from the California Institute of Technology in 1975. He is chairperson of the Committee on Research on Theory and Applications of the Society and a member of the Research Paper Committee. He is an associate editor of *Insurance: Mathematics and Economics*. Since 1976, Dr. Shiu has been a consultant for the Great-West Life Assurance Company. His current research interests are asset/liability management and risk theory. In addition to more than 30 discussions, his papers published in the *Transactions* include "Integer Functions and Life Contingencies" (XXXIV, 1982), "Minimum- R_2 Moving-Weighted-Average Formulas" (XXXVI, 1984), "Algorithms for Cash-Flow Matching," with Rama Kocherlakota and E. S. Rosenbloom (XL, 1988), and "Arbitrage-Free Pricing of Interest-Rate Contingent Claims," with Hal W. Pedersen and A. E. Thorlacius (XLI, 1989).



Gordon E. Willmot, F.S.A. 1989 and F.C.I.A. 1989, is associate professor of statistics and actuarial science at the University of Waterloo. He received a B. Math in 1980, an M. Math in 1981 and a Ph.D. in 1986, all from the University of Waterloo. Prior to completing his doctorate, he was employed by the Mutual Life of Canada in the group actuarial department. He is the winner of the 1987 International Actuarial Association's ASTIN competition for young researchers. Research interests include risk theory and statistical modeling. He is the author of numerous papers that have appeared in *Scandinavian Actuarial Journal*, *ASTIN Bulletin*, *Insurance: Mathematics and Economics*, *Journal of Econometrics*, *Journal of the American Statistical Association*, *Biometrika*, *Journal of Applied Probability*, *Advances in Applied Probability*, *Statistics and Probability Letters*, and *Canadian Journal of Statistics*. His paper "Models for the Distribution of Aggregate Claims in Risk Theory," co-authored with Harry Panjer, appeared in Volume XXXVI (1984) of the *Transactions*.



FINANCIAL REPORT

BALANCE SHEETS

ASSETS

	YEAR ENDED	
	JULY 31	
	<u>1990</u>	<u>1989</u>
Current Assets:		
Cash and short-term investments	\$3,900,452	\$1,987,681
Accounts receivable, less allowances of \$18,000	136,174	388,196
Inventories—at cost	109,458	176,955
Other	<u>646,182</u>	<u>266,655</u>
Total current assets	\$4,792,266	\$2,819,487
Long-Term Investments—Note B	1,639,954	2,255,474
Furniture, Equipment and Leasehold Improvements—at cost, less allowances for depreciation and amortization (1990—\$255,754; 1989—\$202,610)	330,216	333,126
Custodian Funds—primarily short-term investments, at cost which approximates market—Note C	<u>631,967</u>	<u>347,025</u>
	<u>\$7,394,403</u>	<u>\$5,755,112</u>

LIABILITIES AND MEMBERSHIP EQUITY

Current Liabilities:		
Accounts payable and accrued liabilities	\$1,258,299	\$1,533,932
Unearned revenues	1,454,131	1,010,023
Due to International Actuarial Association	70,021	63,651
Advances (principally on publications)	<u>31,038</u>	<u>24,663</u>
Total current liabilities	\$2,813,489	\$2,632,269
Deferred Rent—Note D	510,966	255,483
Custodian Funds—accounts payable—Note C	15,041	6,405
Custodian Funds—Note C	616,926	340,620
Membership Equity	<u>3,437,981</u>	<u>2,520,335</u>
	<u>\$7,394,403</u>	<u>\$5,755,112</u>

See notes to financial statements.

STATEMENTS OF REVENUES AND EXPENSES
AND CHANGES IN MEMBERSHIP EQUITY

	YEAR ENDED JULY 31	
	1990	1989
Revenues:		
Membership dues	\$2,201,752	\$1,893,530
Meeting registration fees	1,272,005	836,546
Seminar fees	744,566	827,789
Examination fees, calculator sales and educational material sales	5,058,147	4,363,437
Sale of publications	116,504	119,869
Experience studies	—	532,138
Income from allied organizations	176,536	163,886
Investment income	390,335	318,707
Other	61,967	35,040
Total Revenues	<u>\$10,021,812</u>	<u>\$9,090,942</u>
Expenses:		
Salaries and related expenses	\$3,004,693	\$2,578,239
Printing	1,355,893	1,538,570
Travel and honoraria	1,661,072	1,444,568
Postage and mailing	812,438	824,929
Grading services	380,189	462,156
Fellowship Admission Course and intensive seminars	256,409	56,748
Experience studies	—	438,543
Cost of calculators sold	73,524	59,229
Rent	461,117	449,098
Office	332,816	297,039
Computer	84,685	92,351
Public relations/strengthening profession	57,654	64,131
Telephone	91,092	69,720
Professional fees	105,741	67,407
Depreciation—books	39,253	29,648
Depreciation—office	42,645	31,445
Insurance	33,289	31,872
Broadcasting fees	—	158,350
Course development	68,804	—
Research projects	150,000	75,361
Other research expenses	16,390	17,400
Library	16,962	12,638
Miscellaneous	59,500	62,557
Total Expenses	<u>\$9,104,166</u>	<u>\$8,861,999</u>
Excess of Revenues over Expenses	917,646	228,943
Membership Equity at Beginning of Year	<u>2,520,335</u>	<u>2,291,392</u>
Membership Equity at End of Year	<u>\$3,437,981</u>	<u>\$2,520,335</u>

See notes to financial statements.