

CASUALTY ACTUARIAL SOCIETY

Recommendations for Study

EDUCATIONAL COMMITTEE

EDWIN W. KOPF, *Chairman*

THOMAS F. TARBELL

EMMA C. MAYCRINK

PAUL DORWEILER

C. A. KULP

A. H. MOWBRAY

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H. O. VAN TUYL

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CASUALTY ACTUARIAL SOCIETY
SYLLABUS OF EXAMINATIONS

SUBJECTS

ASSOCIATESHIP: (*Part I: Sections 1 to 4*)

- Section 1. Advanced algebra*
- Section 2. Compound interest and annuities certain*
- Section 3. Descriptive and analytical statistics*
- Section 4. Elements of accounting, including double-entry bookkeeping*

(*Part II: Sections 5 to 8*)

- Section 5. Differential and integral calculus*
- Section 6. Finite differences*
- Section 7. Probabilities*
- Section 8. Elements of the theory of life contingencies; life annuities; life assurances*

FELLOWSHIP: (*Part I: Sections 9 to 12*)

- Section 9. Policy forms and underwriting practice in casualty insurance*
- Section 10. Investments of insurance companies*
- Section 11. Insurance law and legislation*
- Section 12. Economics of insurance*

(*Part II: Sections 13 to 16*)

- Section 13. Calculation of premiums and reserves for casualty (including social) insurance*
- Section 14. Advanced practical problems in casualty (including social) insurance statistics*
- Section 15. Advanced problems and practical methods of casualty insurance accounting*
- Section 16. Advanced problems in underwriting, administrative and service elements of casualty (including social) insurance*

EXAMINATION REQUIREMENTS
RULES REGARDING EXAMINATIONS FOR ADMISSION
TO THE SOCIETY
(As Amended May 23, 1929)

The Council adopted the following rules providing for the examination system of the Society:

1. Examinations will be held on the last Wednesday and Thursday during the month of May in each year in such cities as will be convenient for three or more candidates.*

2. Application for admission to examination should be made on the Society's blank form, which may be obtained from the Secretary-Treasurer. No applications will be considered unless received before the fifteenth day of March preceding the dates of examination.

3. A fee of \$5.00 will be charged for admission to examination. This fee is the same whether the candidate sits for one or two parts and is payable for each year in which the candidate presents himself. Examination fees are payable to the Secretary-Treasurer and must be in his hands before the fifteenth day of March preceding the dates of examination.

4. The examination for Associateship consists of two parts. No candidate will be permitted to present himself for Part II unless he has previously passed in Part I or takes Parts I and II in the same year. If a candidate takes both parts in the same year and passes in one and fails in the other, he will be given credit for the part passed. Upon the candidate having passed both Parts I and II he will be enrolled as an Associate, provided he presents evidence of at least one year experience in actuarial, accounting or statistical work in casualty insurance offices or in the teaching of casualty insurance science at a recognized college or university, or other evidence of his knowledge of actuarial, accounting or statistical work as is satisfactory to the Council.

5. In the case of applicants in the following classes, the Council may, upon receipt of satisfactory evidence that applicants are within the terms of this rule, waive the passing of both Parts I and II of the Associateship Examination. Such applicants may become Associates upon passing Part I of the Fellowship Examination, and may be admitted as Fellows by examination, provided they subsequently pass Part II of the Fellowship Examination.

*Arrangements can generally be made even if there is only one candidate in a city.

- (a) Casualty insurance men not less than thirty years of age who have been in the business a number of years and who have attained responsible actuarial, statistical, accounting or semi-executive positions.†
- (b) Fellows and Associates by examination of the Actuarial Society of America or of the American Institute of Actuaries.

6. The examination for Fellowship is divided into two parts. No candidate will be permitted to present himself for Part II unless he has previously passed in Part I or takes Parts I and II in the same year. If a candidate takes both parts in the same year and passes in one and fails in the other, he will be given credit for the part passed.

7. As an alternative to the passing of Part II of the Fellowship examination, a candidate may elect to present an original thesis on an approved subject relating to casualty or social insurance. Candidates electing this alternative should communicate with the Secretary-Treasurer as to the approval of the subject chosen. All theses must be in the hands of the Secretary-Treasurer before the last Thursday in May of the year in which they are to be considered. Where Part I of the Fellowship examination is not taken during the same year, no examination fee will be required in connection with the presentation of a thesis. All theses submitted are, if accepted, to be the property of the Society and may, with the approval of the Council, be printed in the *Proceedings*.

Communications should be addressed to

RICHARD FONDILLER,
Secretary-Treasurer,
CASUALTY ACTUARIAL SOCIETY,
75 FULTON STREET, NEW YORK

Text books are loaned to candidates by the Society to assist in preparation for the examinations. Communications regarding the loan of books should be addressed to the Librarian, Insurance Society of New York, 100 William Street, New York City.

†In support of the candidate's claim that he is within the terms of this rule, he should attach to his application a letter from each of the nominators signing his application. These letters should state the facts of the candidate's experience which appear to entitle the candidate to the benefit of this rule.

RECOMMENDATIONS FOR STUDY

In effect commencing with examinations held in 1930

NOTE: The number in parentheses after the title refers to the more complete description of the book in the *Index* at the end of these *Recommendations*. The texts shown in large Roman type are recommended as master or principal readings; auxiliary readings are shown in smaller type under each section. For readings in periodical literature, only the name of the author, the name of the journal and the volume and page are shown. The subject of the article pertains to that of the Section under which it is shown.

ASSOCIATESHIP (Sections 1 to 8)

(PART I, SECTIONS 1 to 4; PART II, SECTIONS 5 to 8)

PART I

Section 1. Advanced algebra.

This subject includes the matter in the ordinary college algebra, except determinants, continued fractions, and the theory and solution of equations higher than the quadratic. Special emphasis should be placed upon permutations and combinations. Thorough preparation in elementary and intermediate high school algebra and in practical business arithmetic is presupposed.

Text:

Hall and Knight. Higher algebra. (24). First 16 chapters, except Chapters VI, VII and XV.

Auxiliary Texts:

Rietz, H. L. and A. R. Crathorne. College algebra. (52). *Wilson, N. R. and L. A. H. Warren.* College algebra. (74).

Section 2. Compound interest and annuities certain.

Text:

Rietz, Crathorne and Rietz. Mathematics of finance. (53). Chapters I to IV.

Auxiliary texts:

Skinner, E. B. Mathematical theory of investment. (60). Chapters V to X, (1924 edition); *Hart, W. L.* Mathematics of investment. (27). Facility with problems in the elementary mathematics of finance will be obtained by working as many as possible of the 100 exercises given at the close of Part I of Hart's text.

NOTE ON SECTION 2: In addition to a reasonable mastery of the elementary principles of financial mathematics, the student should show acquaintance with the more useful aids to computation. See: *Moore,*

Justin H. Handbook of financial mathematics (43), especially Chapters XV-XX; *Glover, J. W.* Tables of applied mathematics in finance, insurance and statistics (21); or *Van Dyke, J. E.* Complete bond tables (71).

The articles on "annuities" in *Encyclopedia Britannica*, *Encyclopedia Americana*, *Encyclopedia of the Social Sciences*, or in Walford's *Insurance Cyclopedia* should be read to afford acquaintance with the historical, legal and descriptive aspects of the annuity not found in strictly mathematical texts. See also: *Kopf, E. W.* Early history of the annuity. *Proceedings*, Casualty Actuarial Society, Volume XIII, Pt. II, 225; *Avery, John M.* The nature of an annuity. Association of Life Insurance Counsel. *Proceedings*, Vol. IV, 65, May 26, 1928.

Section 3. Descriptive and analytical statistics.

This subject covers the commonly accepted elementary and intermediate methods of statistical compilation and analysis, but excludes advanced applications of mathematics to statistics.

Texts:

Gavett, G. Irving. First course in statistical method. (20); or *Burgess, Robert W.* Introduction to the mathematics of statistics. (7).

Auxiliary texts:

Yule, G. Udny. Introduction to the theory of statistics (75) is an excellent text for intermediate study leading to the more advanced methods. For practical application of elementary methods to economic or business data, see: *Mills, F. C.* Statistical methods applied to economics and business. (41); or *Riegel, Robert.* Elements of business statistics. (50); or *Day, E. E.* Statistical analysis. (13). *Schnackel, H. G. and H. C. Lang.* Accounting by machine methods. (58).

Section 4. Elements of accounting, including double-entry bookkeeping.

The student should have an understanding of the basic principles of double-entry bookkeeping and their application to the following: theory of debit and credit and its application to the presentation of simple accounting facts; the uses and relations of the basic accounting books,—ledger; journal, cash-book and voucher register, with simple columnar development; the technique of periodic adjustments affecting accruals, use of subsidiary ledgers and of controlling accounts; meaning and relation of the balance sheet, loss and gain account and the technique of their preparation as applied to simple problems. The student will be expected to be familiar only with *principles* of accounting applicable chiefly to mercantile and manufacturing accounts (inventory, manufacturing and cost accounts, partnership, consignments, discounts, valuation of assets and good will and issuance of capital stock, and corporate organizations.)

Text:

Kester, R. B. Accounting theory and practice. (33). Volume I, Chapters I to XXX. This subject covers the scope of courses in elementary accounting theory and elementary accounting practice given in university schools of business.

PART II

Section 5. Differential and integral calculus.

Text:

Granville, William Anthony. Elements of the differential and integral calculus. (22). Revised edition. All theory and problems involving trigonometry may be omitted.

Section 6. Finite differences.

Texts:

Forsyth, C. H. Introduction to the mathematical analysis of statistics. Chapters II and III, except Sections 20 and 21. (18); *Henry, Alfred.* Calculus and probability for actuarial students. Chapters II to IX (28); *Institute of Actuaries, Great Britain.* Textbook, Vol. II, Second Edition, Chapters XXII to XXIV, Section 20. (31). See also: Chapter III, by J. W. Glover, in *Rietz, H. L.* "Handbook of mathematical statistics." Boston. Houghton Mifflin. 1924.

Section 7. Probabilities.

This subject covers the algebraic treatment of probabilities.

Text:

Hall and Knight. Higher algebra. (24). Chapter XXXII (except geometrical methods).

Auxiliary texts:

Pearl, R. Medical biometry and statistics. Chapter XI. (49); *Rietz, H. L. and A. R. Crathorne.* College algebra. (52). Chapters on permutations, combinations and probabilities; *Rietz, Crathorne and Rietz.* Mathematics of finance. Chapter VII. (53).

Section 8. Elements of the theory of life contingencies; life annuities; life assurances.

Text:

Dowling, L. Wayland. Mathematics of life insurance. (14). Chapters 1 to 6 and 9.

Auxiliary texts:

Moir, H. Life assurance primer. Chapters I to VIII and Chapter X. (42); *Forsyth, C. H.* Mathematical theory of life insurance (except sections 19 to 23). (19).

The following may be read as introductions to the preceding texts.

Rietz, Crathorne and Rietz. Mathematics of finance. Chapters VIII and IX. (53); *Skinner, E. B.* Mathematical theory of investment. (60). Chapter XII. For an elementary discussion of life insurance, *See: Maclean, J. B.* Life insurance. (37).

NOTE ON SECTION 8: The student is urged to pay particular attention to the mathematics of life annuities.

FELLOWSHIP (Sections 9 to 16)

(PART I, SECTIONS 9 to 12; PART II, SECTIONS 13 to 16)

PART I

Section 9. Policy forms and underwriting practice in casualty insurance.

The student should be generally familiar with the policy forms and rate manuals in use in the several divisions of casualty insurance. Analysis of the policy contract and the study of the descriptive matter and rate tables of the manuals should give the student a sound understanding of the chief characteristics of the various lines of insurance:

- A. The Insuring Clauses of the Contract:* (a) subject matter of the insurance; (b) the contingency insured against; (c) service in investigations and settlements; (d) defense of suits; (e) payment of expenses; (f) exceptions as to coverage; (g) period of insurance; (h) conditions relieving insurer of liability. *B. The Premium:* (a) Unit on which computed; (b) when payable; (c) methods of adjustment when policy is cancelled by insurer or assured. *C. General Provisions:* (a) inspection of premises or subject of the insurance by the insurer; (b) inspection of the assured's books; (c) notice of loss; (d) subrogation.

Texts:

Bates, W. H. Casualty and surety coverages. (3); *Kulp, C. A.* Casualty insurance. (35); *Lunt, E. C.* Surety bonds. (36); *Mackell, L. E.* Principles of surety underwriting. 3rd edn. N. Y. Spectator Co.; *Michelbacher, G. F. and T. M. Nial.* Workmen's compensation insurance. (40); *Michelbacher, G. F. and*

Associates. Casualty insurance principles. N. Y. McGraw-Hill. (late 1929); *Riegel, R. and H. J. Loman*. Insurance principles and practices. (51); *Rough Notes Company*, Indianapolis. Policy and form analysis, 1929. (54); *Ryder, Ambrose*. Automobile insurance. Spectator Co., N.Y. 1924; *Spectator Company*, New York. Accident insurance manual. (61).

Optional readings :

Manes, Alfred. Versicherungswesen, Vol. II.(39) for German point of view; *Welson, J. B.* Dictionary of accident insurance (72), for British point of view.

Section 10. Investments of insurance companies, with special emphasis upon law, principles and practices of investing capital, surplus and reserve funds of casualty and allied lines of insurance.

General readings:

Preparation is presupposed in (a) the principles of economics as in *Taussig, F. W.* Principles of economics. (65); (b) in the principles of investment, *Badger, R. E.* Investment principles and practices. (1); *Chamberlain, L. and G. W. Edwards*. Principles of bond investment (9); *Benson, P. A. and N. L. North*. Real estate: principles and practices. (4); *Bishop, A. L.* The financing of business enterprises. (5); and (c) in the broad outlines of the law of real property: *Kirchwey, Geo. W.* Readings in the law of real property. (34).

Texts:

Moulton, H. G. Financial organization of society. (44); *Zartman, L. F.* Investments of life insurance companies. (76); *Sun Life Assurance Company* (Montreal). The President's Book, Chapter X. (64); *Baldwin, W. E. and Miriam Keeler*. New York Insurance Law, 1929. (2). Sections 12 to 21, with special emphasis upon Section 16; Sections 36, 39 to 47; Sections 71-a, 76 to 82, 86, 100 and 176. (See especially the annotations to these sections of the N. Y. Law in Baldwin-Keeler, 1928 edition). The student should read also the papers on investment subjects contained in the Proceedings or Journals of the following associations and societies since 1925: Investment Bankers Association of America (Committee Reports); Association of Life Insurance Presidents; Actuarial Society of America; Institute of Actuaries, Great Britain; National Convention of Insurance Commissioners, (September, 1929 meeting, Toronto, especially).

Section 11. Insurance law and legislation, including supervision, regulation and taxation of casualty and allied branches of insurance, the principles of the law of insurance, and the provisions of the more important statutes of the United States (and Canada, for Canadian candidates) relating to casualty insurance.

A. Introduction to the law; business law.

Stone, H. F. Law and its administration. (63); *or, Gray, J. C.* Nature and sources of the law. (23); *Conyngton, T. H.* Business law. (10).

B. Supervision, regulation and taxation of insurance business.

Patterson, E. W. Insurance commissioner in the United States. (48); *Couch, George J.* Cyclopedia of insurance law. (11). Vol. I, sections: 244-249; 72-72b; 136; 158; 1109-1112; 1117. Vol. III, sections 583-586.

C. Principles of the law of insurance.

The student should secure a grasp of the *major principles* of insurance supervisory, contract and administrative law.

Hammon, Louis Lougee. Title, "Insurance," in *Corpus Juris*, (25) Volume 32, p. 950 *et seq*: Sections 1 to 31; 39 to 42; 44 to 125; 175 to 323; 324 to 354; 403, 404 and 407; 424; 482 to 491; 492 to 527; 528, 530, 531, 534, 537, 541, 542, 550, 551, 561, 565, 581, 583, 587, 595, 596, 600, 640, 642, 647. This text is exceptionally well written and may be read with profit by insurance students reasonably prepared in (A) and (B) above. The insurance titles in *Corpus Juris* will be found in the law libraries of most insurance companies.

See also the definitions and *general* sections in the following: *Cyclopedia of law and procedure* (12), denoted "Cyc;" and in *Corpus Juris*, denoted "C. J."

Accident insurance, Vol. I, C. J., p. 397; *automobile insurance*, Vol. 6, C. J., p. 867; *burglary, robbery and theft insurance*, Vol. 9, C. J., p. 1095; *casualty insurance in general*, Vol. 11, C. J., p. 30; *credit insurance*, Vol. 15, C. J., p. 1354; *fidelity insurance*, Vol. 25, C. J., 1088; *health insurance*, Vol. 29, C. J., p. 278; *indemnity, in general*, Vol. 31, C. J., p. 417; *liability insurance*, Vol. 25, Cyc., p. 224-b; *livestock insurance*, Vol. 25, Cyc., p. 1516; *Lloyd's*, Vol. 25, Cyc., p. 1523; *plate glass insurance*, Vol. 30, Cyc., p. 1641; *steam boiler insurance*, Vol. 8, C. J., p. 1140; *title insurance*, Vol. 38, Cyc., p. 344.

In event that *Corpus Juris* or *Cyc.* may not be available, the following may be used:

Couch, George J. Cyclopedia of insurance law. (11). Vol. I, Chapter I; Chapter II, parts I, II, III, sections 84-94, 97-103, 134 (riders, manuals, schedules), 166-167, 169-188b, 189, 219-233, 241-249, 292-304.

Vol. II, sections 210-216, 486-501, 502 *et seq.* (powers and authority of agents.)

Vol. III, sections 556-573, 579-586, 703-741.

Vol. IV, sections 817-823.

Vol. V, sections 1038-1065, 1163-1164.

Vol. VI, Chapter 17, Parts I and II; Chapters 18, 19, 20, 23, 24, 28, 29, 33, 34, 36, 37, 39, 40, 41-45, 46.

(These readings in *Couch* were selected for our students by the author.)

D. Current decisions.

See Legal Notes in the *Proceedings of the Casualty Actuarial Society* also in the *Transactions of the Actuarial Society of America* for the past three years. *Bulletin 161*, Department of Labor, New York State, Sept. 1928-July 1929, contains recent court decisions on the New York Compensation Law. See also *Digest of Workmen's Compensation Laws*, 11th edition, 1929, published by Workmen's Compensation Publicity Bureau, One Park Avenue, New York City.

E. Statute law governing insurance companies.

Baldwin, W. E. and Miriam Keeler. New York Insurance Law, 1929, containing the New York Insurance Law and Miscellaneous Laws relating to Insurance. (2). Articles I, II, V-a, X-b, and Workmen's Compensation Law of New York State, page 407. The annotations at the end of the respective sections should be read carefully. The 1928 edition of Baldwin-Keeler contains many important notes on departmental rulings, and opinions of Attorneys General, not found in the 1929 issue.

Brosmith, William, et al. Draft of statutory provisions relating to the business of insurance. Approved by the American Bar Association, Sept. 2, 1927. Published by American Bar Association, 209 So. LaSalle St., Chicago, Ill. (Copies deposited in the New York and Hartford libraries of the Society by the American Bar Association.)

Section 12. Economics of insurance.

This subject includes (A) the theory of risk and (B) the theory and practice of social insurance. Preparation in the principles of economics is presupposed, as in *Section 10*.

A. Theory of risk:

Texts:

Willett, A. H. Economic theory of risk and insurance. (73). Chapters 1 and 7; *Hardy, C. O.* Risk and risk-bearing. (26); *Fisher, Irving.* Nature of capital and income. (17). Chapter XVI.

B. Social insurance:

Texts:

Brucker, Ludwig and associates. Die Sozialversicherung. 3 Vols. (6); *Carroll, Mollie Ray*. Unemployment insurance in Germany. (8); *International Congress of Actuaries*, London, 1927. Papers on social insurance and allied topics in *Transactions*; *International Labour Office*,* Geneva, Studies and reports, Series M, social insurance. (32); *International Labour Review*. International Labour Office,* Geneva, Recent articles; *Manes, Alfred*. Sozialversicherung. (38); *National Bureau of Casualty and Surety Underwriters*. Library bulletin, second annual index, 1929 (45), for bibliography of recent works on social insurance; *Rubinow, I. M.* Social insurance (55), and standards of health insurance. (56); *Seager, H. R.* Social insurance. (59). *United States Bureau of Labor Statistics*. Monthly Labor Review. Issues 1926 to date for summaries of recent developments in social insurance.

PART II

Section 13. Calculation of premiums and reserves, including basis for reserves for accident, sickness, workmen's compensation, pension, unemployment and other branches of casualty (and social) insurance.

Includes: (A) *Workmen's compensation manual rates*; (B) *Merit rating*; (C) *Loss reserves for workmen's compensation*; (D) *Premiums and reserves on other casualty lines*; (E) *Pensions*.

A. *Workmen's Compensation Manual Rates.*

The student should be familiar with (a) the National Council on Compensation Insurance rate making method; (b) the modifications of this method followed in New York and Massachusetts and (c) the Pennsylvania system of rate making. In this and following divisions of Section 13, "Proceedings" means Proceedings of the Casualty Actuarial Society.

References:

Greene, W. W. and Roeber, W. F. The permanent rate making method adopted by the National Council on Compensation Insurance. *Proceedings*, XII, 253; *Roeber, W. F.* Recent developments in workmen's

*Information regarding International Labour Office publications may be obtained from: Washington Branch, I. L. O., 701 Lenox Bldg., Washington, D. C. Prices nominal.

compensation rate making. *Proceedings*, XV, 223; *Smith, A. G.* Compensation rate making procedure in New York. *Proceedings*, XIV, 181; *Kulp, C. A.* Casualty insurance, (35) Chapter XIII; *Hobbs, C. W.* A series of reports to the National Convention of Insurance Commissioners, *Proceedings of the National Convention of Insurance Commissioners, 1925*—Pages 201-211; 1926—Pages 13-18; Pages 253-271; 1928—Pages 87-103.

The *Proceedings* of the Casualty Actuarial Society contain many other papers of interest on Compensation rate making. The following papers are noted as having a bearing on current problems but the student would do well not to confine his study to these references only:

Volume	Page	Author	Subject Matter: Short Title
I	24	Mowbray	Dependability of Experience
III	195	Michelbacher	Law Differentials
VIII	77	Mowbray	Classification of Risks
IX	208	Mowbray	Weekly Limits
XII	268	Dorweiler	Experience Differentials
XIII	154	Dorweiler	Excess Insurance
XIV	262	Haugh	Recent Developments

B. Merit Rating, Workmens' Compensation.

The student should secure access to copies of the Industrial Compensation Rating Schedule—1923*—and the Workmen's Compensation Experience Rating Plan—1928*—and the forms actually used in applying these plans in the rating of individual Compensation risks. These should be studied in conjunction with the following references:

Whitney, A. W. Theory of experience rating. *Proceedings*, IV, 274; *Perkins, S. B. and Wheeler, R. A.* The 1922 revision of the Industrial Compensation Rating Schedule. *Proceedings*, IX, 11; *Richardson, H. F.* Recent developments in schedule rating. *Proceedings*, XIII, 29; *Hobbs, C. W.* Experience rating in compensation insurance. *Proceedings of the National Convention of Insurance Commissioners—1924*, 272-282; *The Travelers Insurance Company.* Pamphlet explaining the logic of the rating procedure of the 1928 Experience Rating Plan. (Apply to Secretary, Casualty Actuarial Society). See also: *Michelbacher, G. F. and Associates.* Chapters 7 and 8, Rates and ratemaking, in "Casualty Insurance Principles," McGraw-Hill, 1929.

*Published by the National Council on Workmen's Compensation Insurance, 151 Fifth Avenue, New York City.

It would be well for the student also to study the Pennsylvania plans of schedule and experience rating and to compare them with the National Council plans. The Pennsylvania experience rating plan is published as a part of the Pennsylvania Compensation Manual. The Pennsylvania Industrial Rating Schedule is published as a separate booklet.

The *Proceedings* of the Casualty Actuarial Society (notably Volume I) contain many papers on merit rating which are of value in tracing the evolution of the present plans.

C. *Loss Reserves for Workmen's Compensation Insurance.*

The standard liability and compensation loss reserve law is contained in Section 86 of the Insurance Law of New York. The convention form of annual statement blank for casualty companies sets forth in schedule form the statutory loss reserve requirements of this law in Schedule P. This schedule should be studied and its principles mastered by the student.

References:

Matthews, A. N. A system of preparing reserves on workmen's compensation claims. *Proceedings*, XIV, 244;
Davies, E. A. Compensation reserves. *Proceedings*, XV, 28.

The student should also be familiar with the use of interest tables and commutation columns in figuring, for individual claims, the commuted value of lump sum settlements, suspension of payments and decreased durations by reason of lump sum advances and other variations from the prescribed method of claim payment.

References:

Spurgeon, E. F. Life contingencies. (62). Chapters I to IV, VII, IX, XI, XII, XIII and XV. *New York Department of Labor. Workmen's compensation tables*, Bulletin 120, September, 1923.

D. *Premiums and Reserves on Other Casualty Lines.*

Fallow, E. S. Accident statistics and reserves. Accident and health lectures. Insurance Institute of Hartford. (16); *King, W. I.* Accident and health insurance from an actuarial viewpoint. *Proceedings*, II, 49; *Tarbell, T. F.* Some observations on accident and health insurance. *Proceedings*, XIII, 47; *Stellwagen, H. P.* Automobile rate making. *Proceedings*, XI, 276; *Barber, H. T.* A suggested method for developing automobile rates. *Proceedings*, XV, 191; *Constable, W. J.* Compulsory automobile insurance. *Proceedings*,

XIII, 188; Massachusetts compulsory automobile liability insurance. *Proceedings*, XV, 171; *New York Insurance Report*, 1928. Volume III, 481-568. Report of examination as to methods and manner of operating of the National Bureau of Casualty and Surety Underwriters. (A critical but extensive summary of the methods of rate making for various casualty insurance lines.); *Black, N. C.* Method for setting up reserves to cover incurred but not reported loss liability. *Proceedings*, XIV, 9.

E. Pensions.

Buck, G. B. Valuation of pension funds. *Proceedings*, II, 370; *Woodward, J. H.* Industrial retirement systems based on the money purchase principle. *Proceedings*, VIII, 13; *Cogswell, E. S.* The statistical survey of the Massachusetts Commission Investigating the Question of Old Age Pensions. *Proceedings*, XII, 97; *Robbins, R. B.* Retirement systems for public employees in New York State. *Proceedings*, XII, 238; *Edwards, H. H. and Murrell, R.* Staff pension schemes in theory and practice. (15).

Section 14. Advanced problems in casualty (including social insurance statistics.

This subject includes: (A) the planning and use of statistical manuals and systems, for the compilation and presentation of casualty insurance statistics, for rate making and administrative purposes; (B) the chief characteristics, sources and uses, of external statistics auxiliary to rate making and administrative procedures in casualty (and social) insurance.

A. Internal statistics of the casualty and allied lines.

Study of the statistical plans in use in connection with the several casualty lines is essential. The "Workmen's Compensation Statistical Plan" and "Instructions for Filing Schedule Z" may be obtained from the National Council on Compensation Insurance, 151 Fifth Avenue, New York City. The "Workmen's Compensation Statistical Plan" for the State of Massachusetts may be obtained from the Massachusetts Rating and Inspection Bureau, 80 Broad Street, Boston, Mass. This latter plan in general is similar to the plans in use in the States of New York and Virginia. Statistical plans for the following lines of casualty insurance are published by the National Bureau of Casualty and Surety Underwriters, 1 Park Avenue, New York;

1. Burglary, theft and robbery
2. Automobile public and property damage liability and collision
3. Glass
4. Miscellaneous public and property damage liability

The Personal Accident and Health Statistical Plan (including the non-cancellable accident and health statistical plan) may be obtained from the Bureau of Personal Accident and Health Underwriters, 1 Park Avenue, New York. A copy of the combined health experience on commercial policies may be obtained from the same organization (\$5 for non-member companies or for additional copy to member companies). *See also: Michelbacher, G. F. and Associates: Chapter 10, in "Casualty Insurance Principles," N. Y., McGraw-Hill, 1929.*

B. External statistics. Statistical methods and sources of value in rate making and administrative procedure in casualty (and social) insurance.

Texts:

Department of Commerce, Washington, D. C. Statistical Abstract of the United States (68), Commerce yearbook (67), and Survey of current business (69); *Federal Reserve Board, Washington, D. C.,* Federal reserve bulletin (70); *Hurlin, R. G. and W. A. Berridge.* Employment statistics for the United States. (30). *International Labour Office, Geneva,* Studies and reports, Series N (statistics), especially reports of the International Conferences of Labour Statisticians. (32); *Kopf, E. W.* Statistics in the service of insurance administration. *Proceedings, XI, 102;* *Newsholme, Arthur.* Elements of vital statistics. (46); *Schmeckebier, L. F.* Statistical work of the National Government. (57); *United States Bureau of Labor Statistics.* Bulletin 326, methods of procuring and computing statistical information; *Whitney, A. W. and O. E. Outwater.* The past and future of workmen's compensation ratemaking. *Proceedings, X, 148.*

The student should have access to the *Industrial Bulletin* of the New York (State) Industrial Commission (Albany); *Labor and Industry,* Pennsylvania Department of Labor and Industry (Harrisburg); *Wisconsin Labor Market,* Wisconsin Industrial Commission (Madison).

Section 15. Advanced problems and practical methods of casualty insurance accounting, including the preparation of schedules, exhibits and annual statements.

This subject includes the treatment of advanced practical problems of modern insurance operating accounts. The purpose and the technique of the preparation of the annual statement, with accompanying schedules, including schedule W and the New York Casualty Experience Exhibit, should be thoroughly understood.

Texts:

Hull, Robert S. Casualty insurance accounting. (29).

Periodical readings:

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The accounting provisions of the liability and compensation loss reserve laws in force in New York, Massachusetts, Illinois and other States should be carefully examined. The student should endeavor to obtain from practical discussion and close observation, critical reading and original thinking, a facility for the solution of the accounting problems which come to the supervising actuary of a casualty and miscellaneous line office.

Section 16. Advanced problems in underwriting, administrative and service elements of casualty (including social) insurance.

Technical proficiency in these subjects can be developed only by direct discussion with competent executives, underwriters, engineers and adjusters and through extensive reading of the professional papers read before the several organizations of supervisory and administrative officials. It is strongly recommended

that students seek instruction through these means. Insurance periodicals, proceedings of conferences and conventions, technical papers in journals devoted to applied economics featuring the insurance sciences, afford sidelights on major problems of the casualty insurance business, its administration, history and relation to the public interest. The systematic reading of one insurance journal for the Pacific Coast, one for the Middle West, one for the East, and one British* and German† journal will keep the student in touch with current developments in the insurance business. Foreign experience and practice should not be ignored.

**Post Magazine and Insurance Monitor, or Insurance Record*, London; *The Policyholder*, Manchester.

†Neumann's *Zeitschrift für Versicherungswesen*, Berlin. The *Zeitschrift für die gesamte Versicherungs Wissenschaft* (quarterly), Landshuter Strasse, 26, Berlin, W. 30, Germany, contains international reviews of exceptional interest and value.

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