

NOTES ON OTHER ACTUARIAL JOURNALS

BY SIR WILLIAM ELDERTON, K.B.E., PH.D. (OSLO), F.I.A., F.F.A.,
AND H. L. SEAL, B.Sc., PH.D., F.F.A.

AMERICA

Transactions of the Society of Actuaries,

Vol. III, No. 7, September 1951

HOWELL, V. *The economic power of the life insurance companies*, pp. 287-93. Presidential address reviewing the growth of life insurance companies and their place in the economy of the nation. It is written with humour and wisdom.

DUBLIN, L. I. and SPIEGELMAN, M. *Health progress among industrial policy-holders*, 1946-1950, pp. 294-337 (including discussion). Continues two earlier studies of the Metropolitan Life's mortality covering the years 1911-1935 and 1936-1945, respectively. The company's mortality, which relates mainly to urban wage earners, has now been reduced to the level of the general population.

RICHARDSON, C. F. B. and HARTWELL, J. M. *Lapse rates*, pp. 338-96 (including discussion). A review of the actuarial literature in Great Britain and the U.S.A. on lapse rates is followed by a study of the statistics of 20,843 policies issued by the Mutual Life of New York in the first half of 1946. The factors considered include income, age and occupation of the insured, amount of premium, length of experience of the agent, his lapse rate and his sales technique.

NIESSEN, A. M. *Mortality of railroad annuitants*, 1946-49, pp. 397-411 (including discussion). '...there is no evidence of a significant improvement in mortality among railroad nondisability annuitants over the last six years.'

COWARD, L. E. *The Retirement Annuities Act of the Government of Alberta*, pp. 412-28 (including discussion). An account of the calculation of deferred-annuity rates for the Province of Alberta. Improving mortality was allowed for by making separate tables of rates for ten-year groups of years of birth.

THALER, A. M. *Group major-medical expense insurance*, pp. 429-82 (including discussion). A discussion of the group insurance of medical expenses with an analysis of the results of a questionnaire directed to more than 5,000 supervisory staff of the Prudential of New Jersey. The investigation is a fine piece of actuarial research *in vacuo*; the numerous German works on the subject of medical expense insurance (see, e.g., Bertsche's review in Part 2 of the *Zeit- und Forschungsfragen der Versicherungswirtschaft*, 1948) are, however, overlooked.

The number also contains a record of informal discussions on General matters, Interest rate and investments, Agency compensation and costs, Group coverage, and Social security.

GERMANY

Veröffentlichungen des Deutschen Aktuarvereins, No. 1, 1952

The Deutsche Aktuarverein (German Society of Actuaries), founded in 1935, was proscribed by the military authorities after the fall of Berlin. It was legally reconstituted in 1950, largely owing to the efforts of Dr Edward Rose who was elected its first post-war president. In the meantime, however, the Deutsche Gesellschaft für Versicherungsmathematik (German Society for Actuarial Mathematics) had been founded in the Western Zone of Germany and held its first meeting in May 1949. Its official journal for 1950 was reviewed in *J.I.A.* LXXVII, p. 127. The Deutsche Aktuarverein has now recommenced publication of its own transactions under the title indicated above. In the announcement the hope is expressed that in due course the Deutsche Aktuarverein of post-war Berlin will amalgamate with the society of the Western Zone and publish a single actuarial journal. (This has, in fact, now occurred.)

FREUDENBERG, K. *Betrachtungen über Sterbetafeln und Sterblichkeit*, pp. 15-24. General comments on mortality and graduation with refutation of criticisms due to Sachs (see *J.I.A.* LXXVI, 300).

LORENZ, P. *Der Schluss vom Teil aufs Ganze und der mathematischstatistische Begriff der Wahrscheinlichkeit*, pp. 25-43. An elementary exposition of the derivation of confidence intervals for relative frequencies derived from a finite universe.

BERGER, J. *Über die Deckungsrückstellung der vertraglichen Krankenversicherung*, pp. 45-59. Remarks on the calculation of reserves by companies transacting hospital, surgical and medical care insurance.

This part also contains an obituary notice of Dr Edward Rose, one of the original founders of the Deutsche Aktuarverein in 1935.

ITALY

Giornale dell' Istituto italiano degli Attuari,
Vol. XIV, 1951

The *Giornale*, official publication of the Italian Institute of Actuaries, last appeared in 1943 (see *J.I.A.* LXXIV, 149). The Institute was reorganized under new statutes in November 1949, and recommenced its regular meetings in Rome in 1951. We are certain that the *Giornale* will maintain its high reputation among actuarial circles throughout the world and we welcome its reappearance.

OTTAVIANI, GIUSEPPE. *Sulle catene doppie di Markoff*, pp. 7-15. A demonstration that, contrary to general belief, a non-degenerate Markoff chain can exist in two dimensions.

TEDESCHI, B. *Alcune considerazioni sulla teoria classica e sulla teoria collettiva del rischio*, pp. 16-35. Defends Ottaviani's criticisms of collective risk theory (see *J.I.A.* LXXIII, 149) against Segerdahl's counterblast (see *J.I.A.* LXXII, 526). Applies an inequality of Kolmogoroff to obtain an upper limit to the probability of an office's 'ruin' at one of the next n valuation dates.

CULTRERA, R. *Valutazioni attuariali di congiuntura*, pp. 36-44. Modifications required in a solvency valuation to allow for the effects of inflation on administrative expenses.

OTTAVIANI, GIOVANNI. *Considerazioni sul problema del pieno relativo nella assicurazione incendi*, pp. 45-58. Fire offices often reinsure a certain proportionate part of each risk accepted. The problem is to determine for a portfolio of risks those proportions which minimize the probability of ruin subject to a constant total profit margin.

ZWINGGI, E. *Calcolo retrospettivo della riserva mediante prove*, pp. 59-64. In using Jecklin's t -method of approximate valuation of endowment assurances (see *J.I.A.* LXXIV, 353) the mean entry age can be determined by sampling 200 cases at random.

HAGSTROEM, K. G. *Sulla dispersione dei numeri primi*, pp. 65-73. An experimental urn scheme is devised to show that the number of primes in 100 integers chosen at random is not distributed binomially. Interesting; but can the number of primes be dealt with on the lines of probability? (See *Nature*, 25 July 1942, following a letter in issue of 11 October 1941.)

This number also contains obituary notices of P. Medolaghi, president of the Institute from its foundation in 1929 until his death in 1950, and of I. Messina. Summary accounts appear of meetings of the Institute at which F. P. Cantelli, now president, discussed commercial discount practices, de Mori lectured on the insurance of sporadic risks like crop destruction, Giuseppe Ottaviani on the mathematical concept of infinity, and Palma on post-war social insurance law in Italy.

SCANDINAVIA

Skandinavisk Aktuarietidskrift,
1951, Parts 3 and 4

ARFVEDSON, G. *A probability distribution connected with Stirling's second class numbers*, pp. 121-32. The distribution is

$$\binom{N}{r} \frac{\Delta^r o^n}{N^n} \quad (r=1, 2, \dots, N)$$

N and n being parameters. The factorial moments are derived and the tendency to the normal law as $N \rightarrow \infty$ demonstrated. (The same distribution was studied with essentially the same results by Stevens, 1937, *Ann. Eugen.* VIII, 57 and by Jordan, *Calculus of Finite Differences*, 1939. Tables of the differences of the powers of zero have been produced by various authors.)

DALENIUS, T. and GURNEY, M. *The problem of optimum stratification*. II, pp. 133-48. Continues a paper in the 1950 volume (see *J.I.A.* LXXVII, 305) by discussing optimum stratification (i) using a specific stratification variable, (ii) for ratio estimates, (iii) when costs are considered, (iv) when sampling from a finite universe. There is a short discussion of practical applications.

WOLD, H. *Demand functions and the integrability condition*, pp. 149-51. Reply to a criticism of Samuelson in *Economica*, 1950.

HARBITZ, G. *Post-war mortality among industrial insured lives in Norway*, pp. 152-57. The 1946-50 ultimate mortality of industrial insured lives in the 'Fram' is only 81% of that of the previous quinquennium and differs little from contemporaneous population mortality.

VAJDA, S. *Analytical studies in stop-loss reinsurance*, pp. 158-75. The net premium of a contract reinsuring the annual losses of an insurer in excess of a fixed constant amount C may be estimated by averaging the excesses of n successive years' experience. The objection to this in practice is that the result may be zero. The author proves that this estimate is unbiased; that is, in repeated sampling from the same universe of annual losses the expected value of such estimates is the true mean excess loss. It is not noticed that the estimate is also of minimum variance so that all other unbiased estimates are of equal or greater variability (Halmos, 1946, *Ann. Math. Statist.* XVII, 34). An attempt is made to improve the estimate by specifying the universe of losses as of, e.g. Poisson or Normal form. In view of the preceding comment an improvement can only be made if a bias is acceptable, e.g. a 'safe side' bias from the reinsurer's point of view. The problem is very interesting.

MEDIN, K. *The sickness experience of the Valkyrian Insurance Company, 1939-1948*, pp. 176-96. As is usual on the continent, the frequency of new sickness cases is distinguished from the study of the persistency of sickness. Males and females do not differ greatly in their sickness persistency but between 25 and 55 the frequency of new cases is much higher for the women. The insured belong to various professions and generally to the upper middle class. A feature of the investigation is that the figures are given separately for waiting periods of 1, 4 and 13 weeks, respectively.

ØTTESTAD, P. *On the test of the hypothesis that the probability of an event is contained within given limits*, pp. 197-201. On the assumption that all values of p are equally likely, a test is devised for the hypothesis that p is less than, instead of greater than, c . The power function of the test is also derived.

SWITZERLAND

Mitteilungen der Vereinigung schweizerischer Versicherungsmathematiker,
Vol. LII, Part 1

AMMETER, H. *Wahrscheinlichkeitstheoretische Kriterien für die Beurteilung der Güte der Ausgleichung einer Sterbetafel*, pp. 19-72. A mainly expository account of testing mortality table graduations. Considers the minimum- χ^2 method most suitable for fitting mortality laws and shows that the P_λ tests are appropriate if alternative graduations lie wholly above (or below) that tested. The standard χ^2 test is a good all round test. The reference to Seal's method of combining the χ^2 and Stevens's sign tests overlooks that the method is incorrect (Fraser, 1950, *Biom.* XXXVII, 447).

FÉRAUD, L. *Sur l'actuariat des assurances collectives*, pp. 73–96. Points out four *moments dramatiques* in the development of collective, as opposed to individual, techniques. These are: (i) The grant of pensions based on final earnings; (ii) Allowance for future entrants; (iii) Recognition of alternative funding methods; (iv) The broad economic approach to social security.

RUFENER, E. *Über eine spezielle Klasse von Frequenzfunktionen*, pp. 97–120. Derives the distribution of the sum of n unequal continuous rectangular random variables. The result is not new (Schols, 1887, *Ann. Ec. Polytech. Delft*, III, 140. See *J.S.S.* x, 255).