

## NOTES ON OTHER ACTUARIAL JOURNALS

By H. L. SEAL, B.Sc., Ph.D., F.F.A., J. HAMILTON-JONES, M.A., F.I.A.,  
AND B. P. PAIN, M.A., F.I.A.

## ARGENTINE

*Anales del Instituto Actuarial Argentino*, 1, Part 2, 1952

SOUTO, J. B. *Interpolación con dos y más variables*, pp. 107-74. Expository treatment of bivariate interpolation forming part of the actuarial courses at the University of Buenos Aires.

GALE, J. G. *La notación universal*, pp. 175-79. A review of the recent changes in the international actuarial notation.

GALE, J. G. *Problemas de la seguridad social*, pp. 180-86. A review of social security measures in Chile and of some general views expressed by U.S. actuaries on the subject.

ACERBONI, A. V. *Funciones del actuario en los ramos generales de seguro*, pp. 187-95. The place of the actuary in non-life insurance.

## FRANCE

*Bulletin Trimestriel de l'Institut des Actuaire Français*, 65, 1954

LUBLIN, M. *La loi d'âge commun et la formule de Makeham*, pp. 21-29. Shows that the relation

$$\prod_{j=1}^N \frac{l_{x_j+t}^{(j)}}{l_{x_j}^{(j)}} = \frac{l_{w+t}}{l_w}$$

implies that (i)  $\mu_x^{(j)} = A_j + B_j e^x$ , where  $B_j$  may be zero for all  $j$  except one, or (ii)  $\mu_x^{(j)} = a_j + l_j x$ . It is overlooked that this result is a special case of one of Quiquet's classical studies in this very *Bulletin* (1908).

MARRE, R. DE LA. *Relations entre le bénéfice globale des entrepreneurs, le prix global de la production et les montants globaux des dépenses des diverses catégories de consommateurs*, pp. 31-42. Equations are developed connecting the various incomes and expenditures of enterprises in a closed economic system. These equations are then applied under the alternative conditions of scarcity and abundance.

BAUDEZ, G. *Sur le principe d'indétermination*, pp. 43-60. Shows that Heisenberg's principle of indeterminacy does not contradict the type of determinism the author has advocated (see *J.I.A.* 79, 336).

*Bulletin de l'association des actuaires diplômés de l'institut de science financière et d'assurances*, 1954

EYRAUD, H. *Le monopole bilatéral*, pp. 1-3. A mathematical analysis of the foreign exchange problem of two countries each with a monopoly of a single, different product.

- MOREAU, R. *Méthode de comptabilité par classement de fiches*, pp. 4-9. Description of the card accounting system of an industrial assurance company.
- MALIGNAC, G. *Comparaison entre les systèmes de retraite par répartition et par capitalisation dans une population stable*, pp. 10-22. Analyses the pension bills under the assessment and reserve systems, respectively, on the assumption that the population has constant rates of mortality and increment.
- PETITJEAN, M. *Comparaison des taux d'équilibre en répartition et en capitalisation dans le cas particulier du régime de retraites de la S.N.C.F.*, pp. 23-26. Applies the general formulae of the preceding article to the particular case of the French national railways.

## HOLLAND

*Het Verzeekerings-Archief (Actuariel Bijvoegsel)*, 31, 1954

- JAGER, J. DE. *Sampling distributions and graduations*, pp. 29-50. Derives the s.d.'s of (1)  $m/n a_x$  calculated (a) directly from the observations, (b) from 'mechanically' graduated values of  $q_x$ , and (c) from Makeham-graduated values of  $\log l_x$ , and (2) the Makeham constants  $c$ ,  $\log g$  and  $\log s$  based on (a) four values of  $\log l_x$  and (b) four sums of  $m$  values of  $\log l_x$ . It is shown that 1(a) and 1(b) have essentially the same s.d.'s and a numerical example suggests that this also holds true for 1(c).
- HEER, W. J. C. DE. *Das Zinsfussproblem*, pp. 55-66. Refers to two papers by Ivo Lah (see *J.I.A.* 73, 444 and 79, 340) on changes in  $a_x$  due to a change in the rate of interest  $i$ . Examines the simplification of assuming that the Taylor series for  $a_x$  as a function of  $i$  becomes a geometric series after a certain term, and compares numerical results on this assumption with those obtained by two of Lah's formulae. Shows that when the Taylor series for  $a_x$  is accurately a geometric series  $l_x = KS^x$ .
- JANSEN, J. H. C. *Frequency distribution of the age differences of married couples*, pp. 67-73. Suppose it is required to calculate the mean value of an annuity that is a function of the difference between the ages of two individuals. We have

$$\text{Mean } (a_{\Delta}) \doteq a_{\text{mean } \Delta} + \frac{1}{2} m_2 \left( \frac{d^2 a_{\Delta}}{d \Delta^2} \right)_{\Delta = \text{mean } \Delta}$$

where  $m_2$  is the variance of the age differences. Numerical examples show the accuracy of this formula applied to widows' pensions valued by the collective method.

## SCANDINAVIA

*Skandinavisk Akuarietidskrift*, 36, 1953

- ANDERSEN, E. S. *On sums of symmetrically dependent random variables*, pp. 123-38. A generalization and extension of results published in vol. 32.

- COX, D. R. and SMITH, W. L. *A direct proof of a fundamental theorem of renewal theory*, pp. 139-50. If  $h_n(x)$  is the density function of the sum of  $n$  absolutely continuous random variables  $X_n$  with  $\xi(X_n) = \mu_n$  then

$$\lim_{x \rightarrow \infty} \sum_{n=1}^{\infty} a_n h_n(x) = a\mu^{-1}$$

where  $a$  is the average  $a_n$  and  $\mu$  the average  $\mu_n$ . This theorem is stated precisely and proved.

- BORENIUS, G. *On the statistical distribution of mine explosions*, pp. 151-57. A limiting case of Blomqvist's mine problem (see *J.I.A.* 79, 340). The minefield is now infinitely broad and the number of enemies infinitely many, but  $mp \rightarrow x$  and  $np \rightarrow y$  both  $x$  and  $y$  being finite.
- ULIN, B. *An extremal problem in mathematical statistics*, pp. 158-67. Sharpens Selberg's inequality (see *J.I.A.* 71, 322).
- MEIDELL, B. *Randbemerkungen zum Landréschen Maximum*, pp. 168-81. Discusses some of his own earlier results published in the 1912 (Amsterdam) and 1937 (Paris) Congress Proceedings.
- GRENNANDER, U. and ROSENBLATT, M. *Comments on statistical spectral analysis*, pp. 182-202. A discussion of the possible practical application in time series analysis of some theorems published in *Ann. Math. Statist.* 24, 1953.
- BENKTANDER, G. *On the variation of the risk premium with the dimensions of the house within fire insurance*, pp. 203-14. An important but obscure contribution to the statistical theory of fire insurance. The risk premium rate is assumed to be a linear function of the insurance value of a house and Swedish statistics are used to confirm the hypothesis.

## UNITED STATES AND CANADA

### *Transactions of the Society of Actuaries*, Vol. 5, 1953

- LARUS, J. R. *Address of the President*, 231-38. Discusses actuarial examinations, meetings and hobbies.
- JACKSON, P. H. *Experience rating*, 239-67. A mathematical basis for judging the efficiency of several methods of distributing the surplus under group contracts.

Besides the discussions on several earlier papers this number contains a digest of discussions on (1) unemployment insurance, (2) sickness and accident insurance, (3) ordinary disability benefits, and (4) surplus.

### *Transactions of the Society of Actuaries*, Vol. 6, 1954

- GREVILLE, T. N. E. *On the formula for the L-function in a special mortality table eliminating a given cause of death*, pp. 1-5. The author proposes an approximation for  $\int_0^n l_{x+t}^* dt$ , where the asterisk denotes that a specified cause of death has been eliminated from a standard table of  $l_x$ .

HUNTER, A. and COLEMAN, J. F. *Surgical and medical insurance by a Blue Shield plan*, pp. 6-25. Analysis of the Blue Shield (medical care) Plan in south-eastern New York state indicates a steady uptrend in claim incidence and emphasizes the need for adequate reserves.

NIESSEN, A. M. *Measure of actuarial soundness in a pension plan of the Railroad Retirement type*, pp. 26-42. When new entrants into a pension plan pay excess contributions the unfunded accrued liability is not a criterion of actuarial soundness.

BOERMEESTER, J. M. *Minimum statutory nonforfeiture values for retirement annuity contracts*, pp. 43-47. Considers the New York law on statutory minimum surrender values for annual-premium deferred annuities (with return).

RODE, E. A. *Prudential mortality experience by sex*, pp. 48-60. Covers standard ordinary branch issues of 1919-51 exposed between 1948 and 1952 anniversaries.

MYERS, R. J., FRIEND, E. H. and HOLBERTON, F. E. *Joint-and-Survivor annuities for the uniformed services: Legislative history and application of UNIVAC to actuarial problems involved*, pp. 61-84. Five man-years of work was completed in 40 hours' computing time (after four weeks programming) on the UNIVAC.

WALKER, H. *The 'Elas' Life Income mortality table*, pp. 85-98. An adaptation of the *a-1949* Table with Projection B (see Jenkins & Lew in *T.S.A.* 1) for use by the Equitable in its current deferred annuity contracts and settlement options.

SHUR, W. *A general method of calculating experience net extra premiums based on the standard net amount at risk*, pp. 99-107. Solves for  $N_x^D$  in the relation:

$$\text{Extra premium} = \frac{v}{N_x^B} \sum_{t=0}^{\infty} D_{x+t}^B (q_{x+t}^B - q_{x+t}^A) (1 - {}_{t+1}V_x^C) = \frac{N_x^D}{N_x^B} (P_x^D - P_x^C)$$

where  $A$  indicates the standard,  $B$  the substandard and  $C$  the valuation table, respectively.

CUETO, M. R. *Monetary values for ordinary disability benefits, based on period 2 of the 1952 intercompany study of the Society's committee, with 2½% interest*, pp. 108-77.

FLETCHER, J. B. *Some 3½% commutation columns a-1949 Table*, pp. 178-82.

LYLE, ANNIE M. *A pilot study of hypertension*, pp. 247-66. The electrocardiogram is helpful (but the X-ray is not) in selecting hypertensive risks.

These numbers also contain digests of informal discussions on: Policy plans and rates, Annuities and settlement options, Equity forms of savings, Federal reinsurance of health plans, Social security, Individual sickness and accident insurance, Premium rates, Policy plans, Investments and Underwriting. There are, in addition, digests of a presentation and discussion of the 1951 *Impairment Study* and of a Smaller company forum.