NOTES ON FOREIGN ACTUARIAL JOURNALS

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AMERICA

Transactions of the Actuarial Society of America, Vol. XL, Part II

R. D. MURPHY. Presidential Address. Reviews progress during the Society's fifty years and discusses the actuary's role as interpreter and future possibilities.

E. A. ABBOTT. Use of Punch-card Equipment in Computation and Listing of Premiums and Reserves under Joint and Last Survivor Immediate Annuities.

W. G. BOWERMAN. Methods used in Disability and Double Indemnity Researches.

A. PEDOE. The Education of the Actuary. An interesting paper: the differences between examination methods, etc. in America and the United Kingdom are discussed.

A. HUNTER. Mortality among Certain Races resident in the United States and Canada. The races are Armenians and Syrians, Greeks, Japanese, Chinese and French Canadians. The high mortality of the Japanese and French Canadians in age group 10–29 and of the Armenians and Syrians over age 50 is noticeable.

B. F. BLAIR. Extension of 1937 Standard Annuity Table to age zero and Commutation Columns for all ages at $2\frac{1}{2}\%$, $3\frac{1}{2}\%$ and 4%.

K. CAMP. Immediate Annuity Dividends.

C. E. WEST. Mortality on Term Insurance and attained age Conversions. An office experience 1919–35, compared with the same office's entire mortality experience. The mortality of the particular class was high except where conversion was made before the end of the term during which conversion was allowed.

W. A. HUTCHESON. Some Sidelights on Actuaries and their Organisations. An attractively written historical study which deals with the Institute of Actuaries, Faculty of Actuaries, and Actuaries' Club, as well as with the American bodies.

W. M. STRONG. Legal Notes.

Report of Joint Committee on Mortality. (1) Mortality on Policies of Large Amounts, (2) Mortality under Insurance Issues 1925–1937, (3) Mortality under Annuity Issues 1931–1937.

The number contains also presentation speeches of Col. Oakley for the Institute of Actuaries and of Mr L. M. Cathles for the Faculty of Actuaries on the Fiftieth Anniversary of the foundation of the Actuarial Society.

BELGIUM

Bulletin de l'Association Royale des Actuaires Belges, No. 47

J. DE MOOR. Sur la divergence des séries statistiques. Treats of the limitations within which it is possible to consider mortality statistics as conforming to a "Bernouilli" series. Advocates the maintenance of a certain proportion between mortality and survivorship liabilities.

M. BEAUFORT. Estimation du bénéfice ou de la perte probable d'une opération d'assurance du type $10/X$. On the calculation in advance of future profit arising from (1) Improved mortality, (2) Improved mortality combined with a change in the interest rate. The symbol $10/X$ refers to a class of assurances where the sum assured varies each year.

E. FRANCKX. Assurance du solde restant dû d'un prêt remboursable par annuités. The assurance being by single premium, the reserve at any stage can be expressed as the difference between two single premiums based on different rates of interest multiplied by constants determinable at the inception of the assurance. This allows of classification, for valuation purposes, by year of birth.

R. MARCHANT. L'assurance contre les dommages causés par les éléments naturels. Summary of a work by Dr Curt Brommel of Berne, which is in its turn a summary of the comprehensive treatise on this subject by Lanz Stauffer entitled "Elementarschäden und Versicherung". In the narrow sense these risks are confined to sudden and unpredictable calamities such as floods, tidal waves, earthquakes, volcanic eruptions, meteorites, storms, etc. In the wider sense the risks may be considered as including damages arising from abnormal meteorological conditions.

FRANCE

Bulletin de l'Institut des Actuaires Français, No. 176

M. DERRIEN. Note sur une méthode approchée pour le calcul des réserves mathématiques des rentes reversibles sur deux têtes. This relates to a method of calculating joint life and survivorship annuities by interpolation. The error involved is from $2°/_{00}$ to $6°/_{00}$ in excess of the true value.

R. RISSER. Note relative à une question d'analyse posée à l'examen de l'Institut des Actuaires Français, pour l'obtention du titre de membre diplômé. The question is to find a solution of the Definite Integral:

$$\int_0^{2\pi} \log \left[\frac{a^2 \sin^2 \theta + b^2 \cos^2 \theta}{(a^2 - b^2) \sin^2 \theta} \right] d\theta.$$

G. PANNIER. Note sur la sous-natalité. Observations of a political nature.

ITALY

Giornale dell' Istituto Italiano degli Attuari, Vol. X, Parts I–II

F. P. CANTELLI. Su una teoria astratta del Calcolo delle probabilità e sulla sua applicazione al teorema detto delle "probabilità zero e uno". Further considerations in regard to the concept of probability set out in the previous paper published in Vol. III, Part II.

G. OTTAVIANI. Sulla teoria astratta del Calcolo delle probabilità proposta dal Cantelli. Shows how Cantelli's concept of the Calculus of Probabilities can be made to apply to any limited or unlimited succession of random variables.

B. DE FINETTI. La teoria del rischio e il problema della "Rovina dei giocatori". On the lines adopted by Lundberg, the principles of the theory of the ruin of gamblers are applied to insurance and to ascertain, in particular, the maximum retention of a Company.

F. SIBIRANI. Identità dedotte dal Calcolo delle probabilità. These identities are obtained by an indirect method.

L. LORDI. A proposito di una forma di assicurazione vita in regime generale di capitalizzazione. Working on the lines set out in Jacob's paper (*G.I.A.* Vol. VIII, Part II), a series of equations is derived setting out the conditions which the risk and accumulation parts of the premium must satisfy respectively. The subject is considered in terms of both periodic and continuous functions.

T. SALVEMINI. Sulla correzione dei momenti empirici di una distribuzione statistica. An interesting paper giving the adjustments for moments when (*a*) Simpson's quadrature formula is assumed, (*b*) formula I of p. 27 of *Frequency Curves and Correlation*, (*c*) a Gaussian quadrature is used. There is doubt as to the justification for using (*a*) in general for such work because it assumes that the function dealt with takes the form $a + bx + cx^2$ and when the moments above the second are wanted higher powers of x are known to be involved. It will however give helpful approximations especially when a remainder term is introduced as is done by the author.

(*c*) involves the calculation of certain ordinates which will not generally be available in curve fitting. The author seems a little concerned because Elderton in *G.I.A.* April 1938, Vol. IX did not insert, in the corrections he gave, a symbol to indicate the size of the base and its powers. In curve fitting the arithmetical work is simplified by making the base the unit and no difficulty arises. If the unit is 5 years we calculate in quinquennia. But if anyone chose to use 5 units in his calculations the nth calculated moment would be 5^n times the figure obtained using a quinquennium as the unit. There is no real loss of generality in omitting the symbol. The author appreciates these points and many of his comments are valuable. There, of course, still remains the practical difficulty that we seldom know *a priori* the starting and ending points and range of the curve; the first and last statistical groups often relate to smaller bases.

I. MESSINA. Sulle frequenze di reingresso e sui problemi ad esse connessi. Formulae for rates of re-entry from the invalid to the active list, with a table drawn from the experience of the elementary Schoolteachers' Fund.

E. FRANCKX. Le operazioni di sopravivvenza. Shows that in certain conditions it is possible to put:

$$\overline{A}\,\frac{1}{xy\ldots(m)\,uw\ldots(n)}=\frac{1}{1+k}\,(1-\delta\bar{a}_{xy\ldots uw\ldots})$$

k and δ' being specially calculated constants. A table following Makeham's law satisfies the conditions but it is only where Gompertz' law holds that a formula on the same lines can be found for a survivorship annuity. Franckx has written on multiple life functions in the Belgian Journal.

P. MAZZONI. Equazione differenziale di Riccati per il premio continuo di un' assicurazione mista. Putting $P_{x+t:\overline{n-t}|}=P$ and taking t as the variable, the equation is:

$$P'=(P+\delta)\,(P-\mu).$$

G. OTTAVIANI. Sulla definizione del premio di risparmio. Further considerations on the subdivision of the premium into risk and accumulation premiums and their relation to the "capitalization law". Shows the connexion between the methods of Kolodziejczyk and Lordi in dealing with this subject.

This double number also contains a review of Insurance during the past year in various countries and a short summary of the following lectures at the Seminario Attuarile.

L. AMOROSO. La teoria matematica del programma economico.

B. DE MORI. Alcune statistiche internazionali nelle assicurazioni contro i danni.

G. MIKELLI. Protezione assicurativa della prole: Basi statistiche per il conferimento degli assegni familiari.

SCANDINAVIA

Skandinavisk Aktuarietidskrift, 1939, Parts I and II

G. A. D. PREINREICH. The Theory of Industrial Replacement. Contends that the mathematical theory developed by Lotka (1933) is only applicable when the range of frequencies is unlimited and not as assumed for distributions of limited range.

S. VAJDA. Die Wahrscheinlichkeit einer bestimmten Auszahlungssumme. Writing

$$v(m, a_m) = \text{Pr.}\left\{\begin{matrix}\text{number of claims of unit S.A. in}\\ m\text{th year from now} = a_m\end{matrix}\right\}$$

$$\text{and}\quad f(n, a) = \text{Pr.}\left\{\begin{matrix}\text{total present value of payments less}\\ \text{premiums during next } n \text{ years} = a\end{matrix}\right\}$$

it is shown that the latter may be derived from the former by means of characteristic functions. Simplifying assumptions are then made to produce more practical formulae.

P. OTTESTAD. On the Use of the Factorial Moments in the Study of discontinuous Frequency Distributions. Further interesting extension of Guldberg (1931) and Ottestad (1937).

R. VON MISES. An inequality for the moments of a discontinuous distribution. For any discontinuous distribution with smallest interval c

$$c\mathrm{M}_\nu \leqq 2\mathrm{M}_{\nu+1} \quad \text{for} \quad \nu \geqq 1$$

if the moment $\mathrm{M}_{\nu+1}$ exists. The factor 2 cannot be replaced by a smaller one whatever the value of ν.

K. G. HAGSTROEM. Studies in Insurance Mathematics. (Fifth paper.) Discusses (i) some curves of future interest, (ii) a nomogram for the yield of perpetuities, (iii) yield on premium reserve and lines of equal interest (isotocs), (iv) different reserves appearing in actual valuations, (v) partial liquidation and legislation in some countries, (vi) bonus methods, (vii) actuarial valuation of estates (e.g. building estates). (v) and (vi) are on the lines of the paper recently submitted to Institute of Actuaries.

The number contains obituaries of N. P. Bertelsen and S. D. Wicksell, the latter at the early age of 48. Both were known to English actuaries and we much regret to hear of their deaths.

SWITZERLAND

Mitteilungen der Vereinigung schweizerischer Versicherungs-mathematiker, No. 38

H. HADWIGER. Über die Integralgleichung der Bevölkerungstheorie. Treats of the solution of the Integral Equation:

$$G(t) = \int_0^a G(t-\xi)\, K(\xi)\, d\xi.$$

$G(t)$ = Density of live female births at date t.
$K(\xi) = p(\xi) f(\xi)$.
$p(\xi)$ = Probability that a female life will be still alive after ξ years.
a = Limiting age of reproductivity.

An unlimited number of solutions are possible depending (*inter alia*) on the forms to be given to the functions $G(t)$ and $K(\xi)$. The essentials for an acceptable solution are formulated.

A. LEHMANN. Über die Inversion des Gauss-schen Wahrscheinlichkeits—Integrals. The problem consists in finding λ, corresponding to a given value of α, from the equation:

$$\frac{2}{\sqrt{\pi}} \int_0^{\lambda} e^{-x^2}\, dx = \alpha.$$

Various direct methods of approach (without the use of Tables of the Probability Integral) are given.

W. BÖRLIN. Gruppenweise Reserverechnung bei Verwendung von Selektions- und Dekremententafeln. Discusses the limits within which the calculation by Select Tables of reserves for future Cash Bonuses (or, as they are here called, Dividends), can be simplified by grouping. The Dividend system considered is one which involves a waiting period (less than the Selection period), and Dividends increasing in Arithmetical Progression. Groupings by Lidstone's and Jecklin's methods respectively are discussed and compared.