NOTES ON FOREIGN ACTUARIAL JOURNALS

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AMERICA

Transactions Actuarial Society of America, Vol. XXXIX, Part II

C. F. B. RICHARDSON. Guaranteed Cash Surrender Values under Modern Conditions. Discusses surrender values generally and compares them with assets share values. Considers difficulties that arise in emergencies.

H. HOLMES. The Standards of Policy Reserves in America and their effect on the Life Assurance Business.

R. D. BALDWIN. An Estimate of the effect of extraordinary Mortality based on the World War and Influenza Epidemic. Data obtained from Sun of Canada show heavy mortality and model office is used to estimate loss.

J. H. BRETT. Annuities on the basis of constant multiples of the Mortality of a Standard Table. Actuarial note.

W. M. STRONG. Legal Notes. Contain several interesting decisions including one on public policy in case of execution for murder and several dealing with disability and double benefit.

Aviation statistics. Tenth report of committee.

The Record. American Institute of Actuaries, Vol. XXVII, Part II.

R. C. GUEST. State Mutual Mortality Experience on Female Lives. Light mortality compared with American Men Select Table. Causes of death analysed.

S. SHANNON. An alternative Method of Solution of certain problems in the Individual Theory of Risk. The three problems discussed are: I, the probability that in n trials exactly nq will be favourable; II, the probability of a deviation in either direction from the most probable; III, the probability that the number of times the event occurs will lie between $nq - t_1$ and $nq + t_2$.

BELGIUM

Bulletin de l'Association Royale des Actuaires Belges, No. 46

L. DOPÉRÉ. La mortalité au Congo belge. Results drawn from the statistics of the Caisse Coloniale, relating to Civil Servants and their wives. Comparison is made with various Belgian tables, but the data are too limited to permit of thoroughly reliable conclusions.

E. FRANCKX. La notion de "Tête arbitraire". Sixth instalment of a series of papers. Makeham's law being assumed, Pure Endowments, Life Annuities, and Survivorship Assurances are expressed in terms of certain parameters, and the condition of "equivalence" is expounded. A table of "Prym's functions" (cp. incomplete Gamma Functions) is given.

J. BAPTIST. Sur la probabilité des moyennes. Investigates the form taken by $\dfrac{\Sigma x}{m}$ where x itself lies between a and b and has a frequency ω_x. Extends the investigation to the mean of m samples of a function of two variables which are limited to a certain domain.

FRANCE

Bulletin Trimestriel de l'Institut des Actuaires Français, No. 174

B. COMBES. Note sur un problème de Calcul des Probabilités. A measure is obtained of the relative degree of improbability, for different values of z, that underlying frequencies in two different groups are connected by a relation of the type $F_1 > F_{2+z}$, and hence by putting $z = 0$, of the improbability that each group can be regarded as constituting a part of a homogeneous group.

J. BRIEUSSEL. Mode de remplacement des actes d'avance sur Polices d'Assurances sur la Vie. A plan for substituting premiums for interest on Policy Loans. Calculations made on three different bases.

B. COMBES. Essai d'Étude Démographique concernant le Personnel récemment recruté par les Grands Réseaux. Practical examples of the application of the formula worked out in the earlier paper to material derived from the statistics of the recently recruited personnel of the Railway Companies, divided into regional groups. Also further considerations on the theory.

No. 175

H. GALBRUN. Du problème d'assurance posé à l'examen d'admission à l'Institut des Actuaires Français lors de la session de décembre 1938. The question is that of calculating the annual premiums (for a benefit on two lives deferred n years) ceasing on the death or permanent invalidity of either life. The difficulty attending the use of a standard Mortality Table is pointed out.

J. BRIEUSSEL. Essai technique sur les caisses autonomes mutualistes. Deals with the history, management, and statistics of these institutions, and with the legislation affecting them.

GERMANY

Blätter für Versicherungs-Mathematik, Vol. IV, Part VIII

F. KNÖRLEIN. Ein arithmetischer Durchschnittsbeitrag besonderer Art für die Gruppenversicherung. In a closed group insurance scheme under which a premium P_x ($x =$ age at entry) is paid in respect of every member, but is averaged annually before apportionment among the members, the average premium will decrease from year to year. A method is now suggested whereby the annual average premium remains constant throughout. The question of surrender values is discussed.

G. HEUBECK. Untersuchungen über Beleihung und Storno in der Lebensversicherung mit Hilfe mathematisch-statistischer Methoden. An investigation, based on the 1935 figures of 50 companies, of the correlations between amounts of total policy loans and total reserves and between the former and the total withdrawals, all measured in terms of the total sum assured. Fairly high correlations are noted (they are positive and negative respectively) but they may well be spurious (*v.* Elderton's *Frequency Curves*, p. 164).

F. INSOLERA. Die Prämienreserven und die Veränderungen der Sterblichkeit in der Zeit. If the force of mortality at any age is a decreasing function of time the policy value at a particular duration increases as time passes.

E. MEYER. Die Bestimmung des Charakters einer Versicherung. Continuation of the author's investigations as to the "type" of an assurance. Type is defined by reference to a risk premium given by the expression $P + {}_{k-1}V - v \cdot {}_kV$.

H. JECKLIN. Nachruf auf drei Schweizer Versicherungsmathematiker. Obituaries of the Swiss actuaries, Schaertlin, Dumas and Riethmann.

Part IX

P. RIEBESELL. Neuere Ergebnisse der mathematischen Statistik. A practical though much curtailed summary of certain applications of the t and χ^2 tests. When applying the test to the example for Type V in *Frequency Curves and Correlation* (p. 97) it would have been preferable to combine the two final groups. R. A. Fisher's Tables for χ^2 in terms of specific values of P and for the test of significance are reprinted.

R. DOLEZEL. Betrachtungen über die Bemessung der Abgangsvergütungen in der Lebensversicherung. General considerations relating to the calculation of surrender values in practice. Special attention is paid to the allowance for expenses.

R. Schönwiese. Neue Sterbetafeln für Leibrentenversicherungen. The *a* (*m*) and *a* (*f*) tables are projected rates suitable for purchasers of annuities in 1925. Employing the 1900–20 British data, rates are now produced to serve for annuity purchasers in 1940. Commutation columns at 4% are provided and it is mentioned that one German company is already using these tables in practice.

Note. The following article appears in the *Zeitschrift für die gesamte Versicherungs-Wissenschaft*:

February 1939. W. Dobbernack. Die Altersversorgung für das Deutsche Handwerk. On the new old age provision for manual labourers in Germany.

HOLLAND

Het Verzekerings-Archief, Vol. xix, No. 3

W. G. J. Ten Pas. Vergelijkend onderzoek van de sterfte onder de geheele bevolking van Nederland en de verzekerden van een groep Nederlandsche levensverzekering maatschappijen gedurende de jaren 1925–1936. An application of the method described in Vol. xix, No. 1, to the comparison of the published results of 46 Dutch life offices with the total population figures during 1925–36. Decennial groups of ages are employed and the insurance material is divided into three classes, "death", "life" and "industrial". A table summarizes the numerical conclusions to be drawn.

J. Snoep. Interpolatie bij veranderlijke rentevoet in levensverzekerings-wiskunde en intrestrekening. Lever's method (*J.I.A.* Vol. liii, p. 174) justified in the case of a table following De Moivre's hypothesis and extended to certain compound-interest problems. In each case the term certain is developed in a power series in δ.

Th. Hochner and Joh. Hage. Eenige opmerkingen aangaande de koerstafels door Joh. Hage. Remarks on a formula given in the Introduction to Hage's Bond Value tables.

Tj. S. Visser. Rendabeler-Voordeeliger. Which of two specified loans is the more advantageous?

J. Vel. Netto koopsommen voor verzekeringen op 2 hoofden met een bepalde soort uitstel van uitkeeringen. A general type of net premium involving two lives.

W. Meyer. Uitkeeringen per kalenderjaar aan rentetrekkers. Expressions are derived for the annual outgo of an annuity fund.

E. T. Steller. Logisch-sluitende intrestrekening. Reply to Post's article in Vol. xix, No. 1.

C. Campagne. Wetenschappelijke Balans van de Vrijwillige Ouderdoms-verzekering (Fonds B) op 31 December 1936. Remarks on the 1936 valuation of the voluntary old age insurance fund.

Vol. XIX, No. 4

A. DE BRUYN. Negatieve en oneindig groote premiën en koopsommen. Anomalous results obtained by expressing expenses as a percentage of the gross premium.

J. VEL. De invloed van abnormale sterftequotienten op de lineaire sterftekansen. The effect of years of exceptional mortality (e.g. 1918) on the linear regression equations of Ten Pas (No. 3 of this Vol.). The latter appends a note.

L. BIJL. Iets over de Höcknersche correctie voor ondersterfte bij lijfrenteniers. Remarks on Hockner's formula, $q'_x - q_x = \alpha p_x$.

L. BIJL. Een enkele aanteekening over het karakter van de premie-correctie bij termijnbetaling. A note on the adjustments to be made on account of monthly premiums.

TJ. S. VISSER. Romantiek in de koerstafels of het gevaar van inter-poleeren. A novel use of one of the tables in Hage's Bond Values.

TJ. S. VISSER. Sur deux formules intéressantes au sujet de l'assurance d'un capital de survie. The solution of a problem in life contingencies.

C. CAMPAGNE. Vijfde en zesde Wetenschappelijke Balans van het Algemeen Burgerlijk Pensioenfonds.

Ongevallenstatistiek betreffende het kalenderjaar 1936.

Wetenschappelijke balansen van het Ongevallenfonds en van het Landbouw-Ongevallenfonds op 31 Dec. 1937.

Three articles dealing with the 5th and 6th valuations of the General Civil Pension Fund, 1936 accident statistics, and the 1937 valuations of two accident funds respectively.

ITALY

Giornale dell'Istituto Italiano degli Attuari, Vol. IX, Part III

B. GULOTTA. Sulla legge di probabilità della differenza tra la media empirica ed il valore medio teorico dei quadrati d' una variabile casuale che segue la legge normale. In a series following the "normal" law the difference between the mean square of the deviations and a mean square derived from random samples is considered, and this difference is itself found to follow the "normal" law.

F. GIACCARDI. Sul calcolo del vitalizio nell' ipotesi di Makeham. The integral, based on Makeham's formula, for a temporary life annuity, is here considered. The results obtained by the use of Bessel functions, and by direct integration by parts, are separately considered; also the error resulting when certain terms in the expansion are neglected.

A. DEL CHIARO. Sulla determinazione dei coefficienti di morbilità. Sickness rates derived from statistics tabulated by Calendar Years are considered; also the modifications which may take place when the year of birth is taken into account.

Vol. IX, Part IV

P. MEDOLAGHI. Indirizzi di ricerca nelle assicurazioni danni. Considers the lines on which indemnity risks should be classified, and indicates a criterion of the homogeneity of a given group. The difficulty arises from the fact that while each group must be reasonably large, the number of factors governing a risk is considerable (e.g. fifteen estimated in the case of Fire Insurance and thirteen in the case of Car Insurance).

S. KOLODZIEJCZYK. Sull' equazione del premio di risparmio nel caso di una legge generale di capitalizzazione. Extends the principle of the "premio di risparmio" (see M. Jacob in Vol. VIII, Part II) to the general case where there are two causes of exit, in respect of one of which a specified sum is paid, a specified proportion of the reserve being paid in respect of the other cause (e.g. death and withdrawal).

C. E. BONFERRONI. Sul calcolo di un accumulo. Gives equations symbolizing the accumulation of a fund; distinguishes between the "one fund" and the "two funds" principles. In the second case payments out are considered as being made by borrowing instead of by indenting on the "Premiums + Interest" Fund.

B. BARILE. Una particolare soluzione dell' equazione del calore. Deals with the solution of equations of the type:

$$\frac{\partial^2 u}{\partial x^2} - a \frac{\partial u}{\partial t} = 0$$

where certain initial and limiting conditions hold good. The method advocated shortens the work of obtaining a solution by successive approximations.

JUGOSLAVIA

Glasnik, April 1939

R. MATJAŠIČ. Osiguranje u iznemoglosti, starosti i smrti (penziono osiguranje) radnika i službenika. Pension insurance for workmen and employees in Jugoslavia.

D. MARKOVIĆ. Tablice smrtnosti i računska kamatna stopa kod osiguravajućih preduzeća u Jugoslaviji. Tables and rates of interest used by insurance companies in Jugoslavia.

E. Sós. Buffonov problem. Discusses Buffon's problem in probability of which a description is given in Todhunter's *History of the Theory of Probability*, pp. 347 *et seq.*

K. VORONJEC. Srednje vrednosti u matematici osiguranja. Discusses various types of means and their connexion with insurance mathematics. Uses them in connexion with Gompertz-Makeham Law, etc.

F. JAMNICKÝ. Pokojninsko zavarovanje obrtnikov. Pension insurance of Jugoslavian tradesmen.

IVO LAH. Pokojninsko zavarovanje obrtnikov. Discusses causes of certain losses from explosion and fire.

SCANDINAVIA

Skandinavisk Aktaurietidskrift, 1938, Parts III and IV

B. MEIDELL. Über verschiedene explicite Lösungen des Problems von der Berechnung des effektiven Zinsfusses bei Anleihen. Development of a simple and accurate explicit formula for the force of interest involved in the equation $K = \sum_{t=1}^{n} A_t v^t$, where K is the market price of a loan under which the total payment at the end of the *t*th year is A_t. The formula involves the rate of interest corresponding to $K = 1$, i.e. the rate at which the loan was originally calculated.

U. VON BECKERATH. Über Chr. Kramp's versicherungsmathematische Arbeiten und seine Formel zur Darstellung der Sterblichkeit, nebst einigen Bemerkungen über die Bestätigung seiner Ansichten durch neuere Untersuchungen. Points out that Kramp used $PM^x + QN^x$ in the graduation of l_x in 1787. As the graduation is of l_x and not μ_x it is not however the "double geometric law" as we now know it. Kramp also had ideas on the mortality of the very young and old which agree with modern developments.

W. ANDERSSON. The Swedish State Unemployment Insurance and the Reinsurance Problem of the Funds. The unemployed insurance, being in principle voluntary, is managed by Benefit Societies. The State Benefit grant is explained: it can have an effect comparable with that of a reinsurance agreement. The technical aspects are discussed.

H. WOLD. On the Inversion of moving averages.

R. FRISCH. On the Inversion of a moving average.

These two papers deal with points that arose in connexion with Wold's dissertation "A study in the analysis of Stationary Time Series".

H. Hadwiger. Ein Konvergenzkriterium für Erneuerungszahlen. If p_λ is the probability of a new entrant remaining at least λ time units in a community, $A_0 = 1$ and $A_n = 1 - \sum_{n=1}^{k} p_\lambda A_{n-\lambda}$ (k being the upper time limit for membership) then the series $\{A_n\}$ is called "renewal numbers". The author develops a criterion of convergency for this series.

SWITZERLAND

Mitteilungen der Vereinigung schweizerischer Versicherungs-mathematiker, Part XXXVI

E. Marchand. Les résultats scientifiques du Congrès International de Paris.

W. Wegmüller. Ausgleichung durch Bernstein-Polynome. A summary of the theory of S. Bernstein's polynomials applied to graduation. A single numerical example is given where a polynomial of the tenth degree appears to leave something to be desired in the way of goodness of fit as judged by a graphical comparison.

P. Güttinger. Eine versicherungsmathematische Beziehung bei Gesamtheiten mit mehreren Ausscheideursachen. A development of a general relation from which expressions like

$$l_{xy}^{aa} \frac{\overline{M_{xy'}^a}}{D_{xy}^{aa}} + (l_{xy} - l_{xy}^{aa}) \frac{\overline{M_{xy'}^i}}{D_{xy}^i} = l_{xy} \frac{\overline{M_{xy'}}}{D_{xy}}$$

may be obtained very simply.

E. Zwinggi. Bemerkungen zum Erneuerungsproblem. Proof that Hadwiger's development in Part XXXIV is merely a special case of a solution given by Fock in 1924.

Part XXXVII

H. Christen. Vergleichende Betrachtungen über den Einfluss des Zinsfusses und der Sterblichkeit auf das Deckungskapital der Lebensversicherung. A study of the effect of the fall in interest and mortality rates in Switzerland on endowment assurance and deferred annuity reserves. The drop in assurance mortality can be represented by a deduction of about 0.8% from the valuation rate of interest. The annuity results are not so simple but show how much more important mortality differences at the older ages are than a change of, say, 1% in the rate of interest.

E. FAURE. Quelques remarques sur le taux de l'intérêt. A theoretical discussion, following Keynes, relating to a "safe" rate of interest. It is concluded that such a rate is about 3·25 % for England and 3·5 % for Switzerland.

P. NOLFI. Versicherungsmathematik und Wirklichkeit. A philosophical treatment of the conceptual basis of insurance. In particular the "classic" and relative frequency notions of probability are discussed and the idea of a "model" is studied.

E. DASEN. Cours et rendement de l'emprunt 3 % de la Défense nationale de 1936 de la Confédération suisse. A yield table for the 3 % Swiss Defence loan at the 1st April of each year from 1939 to 1948.

H. CHRISTEN. Eine Bemerkung zur finanziellen Lage der Kranken-kassen in der Schweiz. A critical review of sickness and medical attention insurance in Switzerland. The reserves calculated on a modern basis are shown to be about three or four times as great as the legal minimum of one year's income which itself is barely covered by the societies. The relative difference between premiums for males and females is also considered too small.

W. RUCHTI. Analytische Auswertung des Kingschen Glättungsprin-zipes. A slight modification of King's osculatory method which permits of an analytic expression for the function graduated.

In addition this part contains obituaries of Gottfried G. Schaertlin, the last survivor of the four founding members of the Swiss Association of Actuaries, Samuel Dumas, the President of the Association, Jacob Riethmann, and Fritz Rosselet.