



SIR WILLIAM PALIN ELDERTON,
K.B.E., Ph.D. (Oslo)

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MEMOIRS

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THE death of Sir William Elderton on 6 April 1962 in his 85th year will have brought a profound sense of loss to all members of the profession and to a circle of friends extending far beyond the world of life assurance which was his main preoccupation.

Elderton was born at Fulham on 26 June 1877, one of the eight children and the second son of William Alexander Elderton; the family had north-country connexions and the father was born in Kendal, Westmorland. Three others of the children of William Alexander were Robert Lapidge, for many years a member of the staff of the National Provident Institution and an Associate of the Institute; Thomas Howard, later Sir Thomas Elderton, K.C.I.E., Chairman of the Calcutta Port Trust; and Ethel Mary, a distinguished statistician who for a long time worked closely with Professor Karl Pearson and who was, with her brother William, joint author of the *Primer of Statistics*. William Alexander, an Army tutor, died early in life and left his widow with a young family to bring up and to educate. It had been intended that Elderton should go up to Cambridge after leaving school, but the untimely death of his father meant the abandonment of the plan and Elderton went perforce straight from school into business life.

He had been educated at Merchant Taylors' School. He was the son of a wrangler who was an excellent French scholar with a keen interest in history and English literature and the reputation of being a brilliant teacher; nevertheless, Elderton seems to have developed slowly. It is said that as a child he had considerable difficulty in learning to read and in committing things to memory, a curiosity in one who in adult life quickly established himself and enjoyed a remarkable memory. There does not seem to be on record evidence of outstanding ability as a schoolboy; his prowess as a mathematician could well have been overshadowed to some extent by that of his contemporary, Jeans, later Sir James Jeans the astronomer, with whom he remained on friendly terms long after leaving school. Elderton was an enthusiastic, rather than an accomplished, games-player; in addition to the traditional games, he played and enjoyed lacrosse. He retained throughout his life his interest in games, particularly in Rugby football.

He was appointed to the staff of the Guardian Assurance Company in May 1894; there is in existence a photograph of an office group taken whilst he was with that company which shows him as an intelligent-looking young man. He served with the Guardian for 14 years, qualifying for the Fellowship of the Institute in 1901. In 1908 he joined the Star Assurance Society under J. D. Watson; he was promoted from Assistant Actuary to Actuary on Watson's retirement in 1912. As it happened, he was the chief officer of the Star for only a matter of months, for when G. J. Lidstone left The Equitable Life Assurance Society in 1913 he recommended Elderton to the Board of the Society as his successor. By this time, he had established an international reputation in his profession; he had, moreover, already given proof of that essentially practical outlook which, allied to his professional skill, made him so remarkable a figure for very nearly the following half-century. The Board of the Equitable accepted

Lidstone's advice and appointed Elderton as Actuary and Manager of the Society in October 1913; so began his association with the Society with which his name will always be linked, an association which ended only with his death in 1962.

At the time of Elderton's appointment, the Equitable had drifted far from the pre-eminent position which it had so long enjoyed following its foundation in 1762 as the first office to transact life assurance on scientific principles. Indeed, in a formal report to the directors, his distinguished predecessor had cast grave doubts on the possibility of the Society's ever achieving that flow of new business which was essential to its active existence. That this was so was due to the restrictions on admission to the Society which the members had imposed on the directors and management a century before; though the control of the Society had been modernized by the adoption of new Articles of Association in 1893 and some progress had been made in the intervening years, it had never completely recovered from the long period of stagnation which followed the introduction of the restrictions. Elderton, with his energy and enthusiasm, revitalized the Society; when he retired from the position of chief executive in October 1942, he had transformed it into a thriving, modern life office. He had been elected a director before his retirement and held that office until his death; for six years he was President of the Society and, as such, chairman of the Board of directors. In all, he spent nearly 68 years in the business of life assurance, of which, in one capacity or another, 48 years were spent with the Equitable. Not even William Morgan had served her better.

During the First World War Elderton served with Sir Alfred Watson as statistical adviser to the Ministry of Shipping, and his work was recognized by the award of the C.B.E. after the cessation of hostilities. He was also honoured by the French Government, who made him a Chevalier of the Legion of Honour. He carried out similar duties in the Second World War, ultimately becoming chief statistical adviser to the Ministry of War Transport when that organization came into being as a result of the merging of the Ministry of Shipping and the Ministry of Transport. For his services in this capacity, he was created a K.B.E. in 1946; a knighthood had already been conferred on him in 1938.

On the basis of his experience in the First World War, he published *Shipping Problems 1916-1921* which dealt with some of the problems calling for a solution by statistical methods; it portrays well the magnitude of the difficulties besetting shipping in time of war. After the last war, he submitted a paper to the Institute, 'Merchant Seamen during the War', which dealt with their mortality and sickness experience. As he said in his paper, little imagination was required to see, behind the mere statistics, the magnitude of the risks run and the courage that enabled the men of the Merchant Service to carry out their work, without which all would have been lost. Elderton's own grit and determination must have been a great encouragement to those around him; he said, when the war was over, that the disasters which were avoided were just as frightening as those which actually came to pass.

In 1938 Elderton was appointed chairman of the White Fish Commission; it was a task which imposed heavy duties on him, taking him to the major fishing ports of the country and involving his attendance there at some unusually early hours in the morning. The establishment of the White Fish Authority was the outcome of the deliberations of the committee. For some years, he served as chairman of the East Indian Railway Company, when it had ceased to be an

operating company and was concerned only with the investment of the sinking-fund moneys for the benefit of the annuity-holders; he was also a member of the Court of the Royal National Pension Fund for Nurses.

Elderton was in turn President of the Insurance Institute of London and the Chartered Insurance Institute; he was chairman of the Life Offices' Association in 1927–28 and of the British Insurance Association in 1937–38. I think he took particular pleasure in the latter appointment, because he felt that the call to office recognized the efforts which he, an actuary in an office transacting life assurance in this country alone, had made to understand the problems and to sympathize with the difficulties inherent in a much more widely-based business carried on across so many frontiers. He was always glad that his earlier experience had included service in an office transacting a general insurance business.

On the professional plane, Elderton must rank as one of the most devoted of the Institute's sons.

His first paper, 'Temporary Assurances', was read before the Institute in January 1903; extensive reference was made in it to curve-fitting, and the President, in congratulating the author on his paper, suggested that he should throw more light on the subject of frequency curves, with which the President thought that actuaries were at the time but ill-acquainted. It was an invitation which was eagerly accepted. Two or three years earlier, Elderton had been introduced to Karl Pearson (who was some 20 years his senior) and he had become absorbed in curve-fitting as a means of graduating mortality tables, even before qualifying for the Fellowship. This was his first love and it was to retain his affections permanently, so much so that he could say in his Presidential Address some 30 years later that he cared more for the subject than for any other at which he had worked. He had, of course, worked extremely hard at it; he accepted readily, perhaps even relished, the slogging arithmetical work involved.

In 1906 he published *Frequency Curves and Correlation*; it was his best-known work and its use by the universities led to the printing of a number of editions. His first paper on the application of frequency curves had been published by *Biometrika* in 1902.

His second paper to the Institute, on spurious selection arising from the amalgamation of data collected over a long period of time, was a criticism of prevailing ideas on the construction of mortality tables and in that sense was to lead on to the paper read to the Institute with R. C. Fippard in 1912, 'Notes on the Construction of Mortality Tables'. The later paper was described by the authors as an attempt to show how rates of mortality could be found from assurance data by the methods used to find rates of mortality from censuses and the records of deaths among the general population, and to show also how the census method could be modified in the case of a prolonged investigation to give a continuous mortality investigation. The paper won general approval; I like Elderton's rather pungent comment, in replying to the discussion, that it could be argued that an investigation such as had been carried out for the British Offices' tables had to be made once before it could be discovered that such investigations were not worth making. With Fippard, he afterwards published *The Construction of Mortality and Sickness Tables*; Fippard, whom Elderton regarded as a man of outstanding quality, was killed in Gallipoli in 1915.

The ideas propounded by Elderton and Fippard led on to arrangements for

the continuous collection of the experience of annuitants and assured lives; though the plan was agreed between the Institute and the Faculty of Actuaries as early as 1914, implementation was delayed for some years by the outbreak of the First World War. In the earlier stages of the work independent committees were appointed in London and Edinburgh, but subsequently a joint working committee was found to be necessary, consisting of Elderton, H. E. Melville and H. J. P. Oakley from the Institute and R. Ll. Gwilt, A. E. King and C. S. Penn from the Faculty. Elderton had had to persuade actuarial opinion, in England and Scotland, that the accepted methods of investigating mortality experience should be abandoned and replaced by others which, with far less labour, would permit the results to be published earlier and allow the investigation to proceed continuously. His part in the foundation and development of the Continuous Mortality Investigation was a major achievement.

Elderton was also associated with Oakley in the investigation of the mortality experience of annuitants during the years 1900–20, from which the $a(f)$ and $a(m)$ tables were produced. Though the collection of the data followed lines which were at the time conventional, their treatment was unconventional, particularly in that the concept of projected mortality was introduced; the idea does not seem previously to have been regarded as forming a practical basis for annuity tables. It has been substantially followed since.

His interest in mortality investigations, combined with his love of frequency curves, led to a unique Presidential Address, with a later paper giving the evidence on which it was based.

On the subject of valuation, Elderton contributed three notable papers to the Institute, 'Approximate Valuation of Endowment Assurances', 'Some Approximations from Valuation Statistics', and 'Valuation in Modern Conditions'. The first of these papers suggested a simple alternative to Lidstone's 'Z-method' which has gained some acceptance. The second, prepared with the assistance of A. H. Rowell, now Sir Andrew Rowell, showed how a simple approximation (the ' n -ages method') could produce much information about the cost of changes in basis simply by using the summarized data, without elaborate calculations. The third (on the bonus-reserve method of valuation) was essentially a plea for a more realistic treatment of the elements in a valuation, when part of the premiums is recognizable as a 'bonus loading'. Hence, it was in the main stream of the classic papers on methods of valuation, which, each in its own way, have sought a more realistic approach than was current in their generation. At the time (1931), ordinary shares formed no substantial part of the portfolios of the life offices; the shift in investment emphasis and the large surpluses which have accrued from ordinary shares in recent times make the paper of greater significance today.

Elderton submitted an array of papers and notes to the *Journal* on other subjects, and he contributed an immense number of reviews of and notes on mathematical, statistical, medical and other publications, many of which had been written in foreign languages. In one form or another, practically every number of the *Journal* published during his active lifetime contains a contribution by him.

In 1938 he delivered an address before the Insurance Institute of London on 'The Impossibility of War Risks Insurance'. In the tense conditions of the time, the paper created considerable interest and it carried conviction, even to many who at first were disposed to disagree with Elderton; his views are believed

to have influenced the manner in which provision was ultimately made for war-damage compensation.

Elderton first coached for the examinations of the Institute on his own account and he was afterwards an official tutor; there are today many actuaries who are proud to claim to have studied under him. He was an examiner on seven occasions and acted as Honorary Librarian from 1916 to 1932. After terms as Honorary Secretary, Vice-President and Honorary Treasurer, he was elected President of the Institute and held office from 1932 to 1934. In all, he served on the Council for 23 years. He took a major part in the foundation and development of the Students' Society; he was the first chairman of the Society and held that office from 1910 to 1919, longer than any of his successors.

In 1938, the University of Oslo conferred on him the honorary degree of a Doctor of Philosophy. Though Elderton had friends all over the world, in North America, South Africa, Australia, India and the Continent of Europe, to none of them was he more drawn than to his friends in the various actuarial societies of the Scandinavian countries. His death reminds us that he brought the first of their actuarial students to this country and that he did much to foster the cordial relations existing between those societies and the Institute, relations which I am sure are as highly valued in Scandinavia as they are here.

He was a corresponding member of the French and the Italian Institutes of Actuaries, a Fellow of the Royal Statistical Society (on whose Council he served for many years) and of the Chartered Insurance Institute, and also for a long period a Governor of the City of London College. He was also a member of the board of statistical studies at the University of London.

Elderton had been elected a Fellow of the Faculty of Actuaries in 1931. In 1937 the Faculty joined with the Institute to present to him a gold medal in recognition of his distinguished services to actuarial science. It was a signal honour, a tribute from the whole of the profession in this country and the climax of his professional career; only on one other occasion, to Lidstone, had such an award been made by the two bodies. There is a reproduction in *J.I.A.* 56 of the plaster medallion by Gilbert Bayes from which Elderton's medal was taken.

His interests outside professional life were as varied and far-ranging as they were within it.

He had an intense love and an intimate knowledge of the countryside, its villages and particularly its churches, which had been fostered by his having, in youth and early manhood, spent his week-ends and holidays walking and camping. In his early business life, he lived at Streatham but some time before his marriage he purchased an old cottage and some acres of land at Amersham; he modernized and enlarged the building and brought a considerable area of the land under cultivation. The garden was an abiding joy to him; the house at Amersham was his home for some 40 years and he left it only a few months before his death, when his health was beginning to fail. He was fond of sketching and painting and had some considerable talent, exhibiting a number of water-colours at the Buckinghamshire Art Society, of which he was for a time President. He was a great reader and a lover of the poets and, with his superb memory, could quote extensively from them; in his youth he had himself tried his hand at composing poetry.

He took a considerable interest in genealogy; he became a Fellow of the Society of Genealogists and contributed to that Society a paper on the family connexions of William Morgan.

He was married in 1920 to Enid Muriel Podmore, whose home before her marriage was at Grange-over-Sands; she and her family were interested in teaching. It was an ideally happy marriage; many of Elderton's interests he shared with his wife—his love of the countryside, of his home, of literature and the arts. She was a great support and comfort to him; a good linguist, she was able to lend him practical assistance in his reviewing of some of the foreign actuarial journals. Lady Elderton, who was some years younger than her husband, survives him. There was one child of the marriage, Hubert, who followed his father to Merchant Taylors' School and later went up to Oxford before service in the Armed Forces during the Second World War; he is now living in South Africa.

As an actuary and statistician, Elderton achieved a position which was unique; he was a man of immense stature in his profession.

It is clear that his early meeting with Karl Pearson made a deep impression on him; it stimulated an already awakened interest in statistical work and in the possibilities of its practical application in the actuarial field. This desire to translate theory into practice was perhaps the key to much of his other professional work; however eager the search for truth on the academic plane, it was the practical uses to which it might be put that fascinated him. His ability to marshal facts and to reject all that was irrelevant to the main argument ensured a remarkable power of analysis. He was superbly equipped for the transition from theory to practice and the ability to express himself clearly and briefly, which distinguished all his work, facilitated the step for others.

With his practical outlook, it was inevitable that he should be a fine administrator; he showed his quality in his work on the Council of the Institute, in his public life and in his business life. He had in full measure the gift of leadership. His own ability and the confidence which he could inspire in those who worked under him were bound to promote both loyalty and enthusiasm and he carried the hall-mark of the true administrator—the ability to delegate. He could use very effectively the arts of persuasion and he always remembered the advice which his mother had given him: 'You may sometimes forget to blame but you must never forget to praise'. Seldom would more vigorous measures be required.

He was devoted to the young, whether in the profession, in business, at his old school or at the University mission in Battersea with which he was associated. He was always generous in acknowledging the help and advice which he had received as a young man; if repayment of a debt of this kind can be made only by putting such assistance to good use and by in turn offering similar encouragement to the next generation, then Elderton discharged his debt in full.

But whatever his achievements and wherever he may rank in his profession and in the world, those who had the privilege of knowing him and working with him will cherish his memory more for the personal qualities of the man himself—his zest for life, his charm of manner, his unfailing kindness and understanding. Great men are usually humble men and it was perhaps Elderton's modesty which above all endeared him to his fellows; surely no actuary ever enjoyed a greater measure of regard and affection—perhaps something deeper—than did Elderton.

His portrait was painted in 1941 by Harold Knight; the original was presented to him by the Equitable and a replica hangs in the luncheon room of the Society. I cannot feel that the artist has really done justice to his subject and I like better the conversation piece painted for the Society by Edward Halliday in 1959,

where Elderton is shown seated as one of a group of four; the characteristic attitude in which he is portrayed is one which brings back vivid memories of him. The picture is reproduced in colour in *Equitable Assurances* by M. E. Ogborn, which was published in the summer. I like also the profile of Elderton which appears on the gold medal; the sense of fun which was never far away has been caught very happily by Bayes. The photograph of Elderton reproduced with this memoir was taken when he was in his fifties.

H. J. TAPPENDEN

JOHAN FREDERIK STEFFENSEN

STEFFENSEN was one of those who 'warmed both hands before the fire of life'. He kept his faculties in full to the end of his 88 years and he was with his friends in the Danish Actuarial Society only five days before his death on 20 December 1961. A sudden heart attack took him and left a host of friends in many countries glad for his life, and sad for their loss.

Steffensen was born on 28 February 1873, in Copenhagen, the son of the Supreme Judge of the Danish Army, and he, himself, took his degree in law at the University of Copenhagen. But after a short period in Fredericia, he returned to Copenhagen to begin his career in insurance, at first in re-insurance and later in the official board which supervised insurance. The mathematical nature of the problems involved in insurance led him to develop his mathematical talents, which were superb—he was self-taught in this subject. In 1912, he gained his Ph.D. at the University of Copenhagen for a study in the theory of numbers.

After three years as managing director of a mutual life assurance society, he found his life's work in the teaching of insurance mathematics. He was the lecturer in this subject at the University of Copenhagen from 1919 to 1923 and Professor of Insurance Mathematics there from 1923 to 1943. But the teacher was not divorced from the practical man of affairs. Steffensen was a member of the Danish Life Insurance Council from 1926 to 1929, when he joined the Board of Statsanstalten for Livsforsikring (the oldest Danish life office, an institution established by state guarantee), being Chairman of the Board from 1941 to 1951.

Yet notwithstanding these responsibilities, Steffensen found time for research in various fields of mathematics, the complete tally of his scientific publications comprising 107 items, the first in 1904 and the last in 1957. His more important works included the theory of statistics (1923), interpolation (1925), insurance mathematics (1934) and the calculation of interest (1936). His work displayed a clarity of thought which revealed the pure mathematician, whatever the subject. The book on interpolation, for example, was a thorough treatment of a subject which would have received more attention had mechanical methods of calculation developed less rapidly. His contributions to pure mathematics went well beyond the fields of the ordinary statistician, and to his own original contributions, he added the joint editorship (for Denmark) for thirty years of *Skandinavisk Aktuarietidskrift*.

It is little wonder that his ability was recognized throughout the Scandinavian countries and beyond. He was President of the Danish Actuarial Society in 1922–24 and 1930–33, and of the Danish Mathematical Society in 1930–36; both