

## REVIEW

*The First Fifty Years, an Appreciation.* By F. A. A. MENZLER, C.B.E., F.I.A., B.Sc. [Pp. 166 + x. London: The Institute of Actuaries Students' Society. Price 25s. net.]

'If any reader', says the Foreword, 'would have preferred the pastel shades of the detached approach the blame must fall on the Committee'. Speaking as an artist the reviewer does not know what is meant by 'pastel shades'; the Committee must come up and see his studio some time. Perhaps the intended reference was to anyone who would have preferred the incisive lines of silver-point history to a colourful oil painting full of atmospheric perspective. It was indeed a felicitous day for the Society when Menzler refused to write a history, and gave us an appreciation instead, with more than a brief glance at probable future trends.

His book covers a period of fifty years more productive than any previous period of twice, or much more than twice, the length, and to appreciate this it is necessary to have more than a hazy idea of how matters stood in 1910. At that time, as Menzler has reminded us (p. 89) the atom was not only unsplit, but unsplittable. So late as 1908 it was still held to be proved by mathematics that heavier-than-air machines could never fly. In 1909 Bleriot flew the English Channel, at a time when a certain newspaper still had on offer £1,000,000 to anyone who could fly over a hedge from one field to the next. In 1910 Latham took only two days to fly from London to Manchester, mostly at a height of about 200 ft. It was the end of an era, with the death of Edward the Peacemaker. The income tax, just raised from 1s. to 1s. 2d., was being collected illegally, the Lords having thrown out Lloyd George's budget of 1909. The issues were the Liberal Party's new land tax, and proposals for a new tax, a so-called super-tax, on all whose incomes exceeded £5000 at 6d. in the £ on so much as exceeded £3000, and the Opposition made the mistake of directing most of its fire upon the former. Willett's Bill for daylight saving was laughed out of the House of Commons. Count Zeppelin was planning his airship flight to the North Pole, and Baden Powell was assuring the readers of *The Times* that no zeppelin would ever be able to pass over our coast line. There was much talk of the Kaiser's threatening naval programme, and the Isle of Man *Weekly Times* asked what would happen if war with Germany broke out, and concluded that 'it would kill all chance of a successful season.'

It was at such a time that the Students' Society was conceived; let us glance round that first assembly of Ordinary Members on 23 January 1911. Some of them had ridden, once or twice, in a motorcar. Few indeed thought they would ever fly in an aeroplane. Most, one suspects, secretly

aspired to be 'passing rich on a thousand pounds a year' before being retired on a hoped-for pension, both uncovenanted and unfunded. But money went a good deal further in those days. The actuarial student could, at the beginning of the month, go to a chop house and choose his steak, and have it served on a cambric covered tray, with potatoes and cabbage, roll and butter, for 1s. 4d.; or towards the end of the month could in a tea-shop have two sausages and mashed for 6d., and an individual apple and blackcurrant pudding for another 3d.; and during the middle of the month could lunch off a 'shilling ordinary' consisting of roll, soup, fish, joint and two vegetables, sweet, cheese and butter and biscuits—and if he had ventured to tip the waitress more than a penny would have been suspect, and might have had his ears boxed. A penny! Some of the things a penny would buy were a dozen boxes of matches; five cigarettes; two eggs; three bananas; four fresh herrings; 1 lb. of bread;  $\frac{1}{2}$  pint of milk; 7 lb. of coal. An ounce of butter cost three farthings; the 'finest tea in the world' was advertised at 3 lb. for 5s., post free.

As we glance round that 'small hall' on that January night, while a discussion is in progress on approximate summation (*not* integration, be it noted) we may well ask ourselves what design or chance brought these young men into the actuarial world. For one of them the answer is the fascinating exposition by the author himself of Joseph Burn's book on finite differences to a boy of fifteen already passably familiar with the engineering drawings of Babbage's Difference Engine (not to be confused with his later Analytical Machine). Others still alive must speak for themselves. And what further fascinations, one by one, and year after year, sped the student on his way, the construction of amortisation tables, the unexpected connexion of the exponential with compound interest, the promise of *King's Text Book*, Part II that 100,000 new-born babies were to be followed through life (a promise never yet fulfilled, despite all that Davidson has so often and so convincingly said), Spurgeon's early rehearsal of the application of the calculus to mortality-interest functions, the ingenuity of commutation columns, osculatory interpolation, Elderton's little book of introduction to frequency curves, Karup's and Lidstone's valuation methods, the subtlety of summation graduation—only slightly dampened by the certainty of failing in Part III if one doubted the sanctity of the net premium valuation, or in Part IV if one denied the precept 'always write down, never write up'.

As the years roll by (and how long it seems to have been from January 1911 to August 1914) take another look and notice the students in heated debate, working off their spleen on one another, and so acquiring a measure of poise before they begin to join in the Institute discussions, instead of carrying their adolescent acrimony into the meetings of the Institute, and the pages of the Institute Journal, and of the *Insurance Record*, as their forefathers had done. (At that time the *Insurance Record* was published weekly, and reported Institute discussions verbatim and immediately, and so weeks before those discussions were printed in the *Journal*.)

In 1919 the Students' Society returned from the war with its ranks sadly depleted. Deprived of an undue proportion of its best brains, a deprivation which of course also affected the Institute (for the Society of one decade is the Institute of the next, or the next but one) there was, nevertheless, much development to keep the newly qualified actuary fascinated by the ingenuity of his comrades and content with his choice of career. To mention only two exciting fields, there were the successive steps in the exploration of approximate valuation techniques, and the realization that new tools, in this case the application of the Jacquard loom punched card to arithmetic, called for a complete overhaul of accounting procedures.

Then, with the examinations out of the way, and perhaps spurred on by the advice of Marks to read and re-read the old volumes of the *Journal*, the young actuary became fascinated by the cleverness of those who had developed actuarial science since the year 1848 (on the basis, of course, of much excellent work done before that date) and particularly in the first ten or fifteen years; or, coming to a later date, was completely enthralled by the genius of G. F. Hardy in reducing the Gauss approximate integration formulas to integral, though not equidistant, datum points, and thereupon using Jacobi's method for the development of Gauss-type formulas 'to find what ordinates should be selected to obtain the best results' with datum points equi-distant. (1883, *J.I.A.* 24, 97). Hence that chapter in *King's Text Book* which was written by Hardy. The examinee knew formula 39(a), but for the most part was unaware of its exciting history.

But as Menzler has said, a professional institution is not an academic body (p. 88). One day the profession may be able to afford to relieve from the tedium of earning a salary some of its most enquiring members, who will thereupon be able to concentrate upon that research he has been in the forefront in advocating (Ch. XII). Meanwhile we might avoid the current tendency to fall in love with catchwords, such as 'electronic' and 'statistics', words which too often repeated become a little wearisome. It suffices to speak of the computer; let us hope that we may one day have data worthy of the application of modern methods of handling them.

Reviewers have been known to review a book without reading it, but it is useless to read a review unless one also reads the book itself. Such is Menzler's fluent style and gift for exposition that his book may comfortably be read in a single evening. It would be superfluous, and indeed impertinent, to go over the same ground again. One limits oneself to a few trifling points of disagreement. The author has doubted 'the view which has been frequently expressed' that 'the general meetings of the Society [before 1915] were not really of much assistance towards the serious business of passing examinations', (p. 13), and here the reviewer must disagree with him. The general meetings were of absolutely no such assistance whatever, nor can one agree that in those days there was not adequate tuition available for those to whom London was accessible. In the view

of one Student, at least, the Society has performed three very much more useful functions. Mention has been made elsewhere of one of the three, the willingness of the Institute to let the Society fly a few kites, and not be above watching to see which way the wind blew.

A second is typified by the word 'Society', which in its original connotation is allied to the latin 'universitas', a community united by companionship. A university gives its undergraduates for only a short period the advantage of rubbing shoulders with one another, and so rubbing chips thereof. The Students' Society provides this office not for four or five years only, but for fifty. No one was ever actually maimed by the fighting in the 'small hall' between 1910 and 1915, and some of those who exchanged the stoutest blows became the stoutest of friends.

In a no less important but more practical way the Society has assisted its members to overcome that defect not uncommon amongst those who have had only a technical education, a disability in communicating fluently and intelligibly. In the Society's early years anyone who had joined in a discussion using notes extensively would have been rebuked, anyone who so far forgot himself as to attempt to *read* his contribution would have been expelled. During the period from the middle of 1942 to the middle of 1944 when it was the reviewer's duty to record the names of those who took part in the discussions at the sessional meetings of the Institute he noted that of 55 speakers (including duplicates, but quite properly excluding the closers) 38 spoke without notes visible or at all. Most of these were speakers who had profited at an earlier day from Students' Society experience. Has there been a falling off in this respect in recent years? If so the blame lies with the Society.

It is a great merit of an 'appreciation' that it can glance at the future, as well as the past. In 1919 Eccles and Jordan demonstrated that a pair of electronic valves could be so connected as to form a circuit having two stable states; Babbage's Analytical Machine began to stir into life again—unnoticed. No one realized at the time the profound effect this would have on actuarial techniques.

Exactly half way between that first meeting of the Society in January 1911, and the first meeting of the second fifty years in January 1961, namely in January 1936, the late Dr L. J. Comrie, of the Nautical Almanac Office, came down to the sessional meeting of the Institute and commented that if a machine were produced with a capacity of one multiplication per second it would be a problem to collect enough work to keep it occupied! 'Mr Podsnap settled that whatever he put behind him he put out of existence.' Well, not quite, but it was sufficient to discourage the Department of Scientific and Industrial Research, and so was a major contribution to that delay which allowed our American cousins to get ten years ahead of us in computer development, to the very considerable detriment of the currency situation.

Of course it was obvious to all in 1936 that once that initial opposition which every new idea must expect had been overcome, the valuation of

a life office could be completed first thing on 1 January in fifteen minutes, and done over again on eight or nine other bases before the actuary went out to lunch; not to mention that the computer would readily construct those commutation columns—which it would render obsolete!

But twenty-five years ago not even the most ardent believer in the potentialities of Babbage's Analytical Machine, using those electronic components for want of which Babbage tried in vain to rely upon mechanical devices, had visualized such a development that it would take the computer less time to *calculate* a seven figure logarithm to base 10 (or to base 8, for that matter) than to search for it in the latest type of 'store' with the fastest access time.

Now we know that the commutation column, the formulae of approximate integration, the Karup, Lidstone and approximate valuation methods to give but the few examples mentioned by John H. Gunlake, C.B.E., in his Presidential Address on 25 October of last year, are as dead as the dodo, and become but museum pieces testifying to the skill of our forerunners in that ever-continuing process of finding a stepping-stone to stand upon while looking for another to which to make the next stride forward. As becomes the dignity of a Presidential Address he did not use such a forceful language, preferring the form of a rhetorical question, but no one doubts that his meaning is the same as that of Menzler in the three short, but pregnant, sentences which commence in the eleventh line of page 88. There's a *new* wind on the heath, brother; there's work to be done.

WILLIAM PHILLIPS