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Publication/Creation

[Glasgow] : [publisher not identified], [1881]

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On Mortality Tables: introducing a New Table of Mortality. By
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 of the Institute of Actuaries; Fellow of the Statistical
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 and Actuaries.

[Read before the Society on February 2nd, 1881.]

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It has been well remarked that "The Life or Mortality Table is essential to the vital statistician as the barometer is to the meteorologist, the balance to the physicist, and the test-tube to the chemist." Tables are constructed to exhibit the rate of mortality prevailing in various districts or countries, and among different classes of the community. When it is remembered that many of these form the basis of life-contingency calculations, involving hundreds of millions sterling, it is evident that they should be so framed as to give, as nearly as possible, a "true" estimate of the probabilities of living and dying which are likely to prevail in the future. Errors in vital statistics arise from two principal causes—(1) incorrect data; and (2) paucity of data. While we can never hope to get rid entirely of errors arising from these causes, yet much can be done to reduce the evil effects on the resulting Tables. Attempts, more or less successful, have accordingly been made, by processes of adjusting, smoothing, or graduating, to eliminate much that is supposed to be abnormal. It is not my intention, however, to propound or support any theory of graduation on a purely scientific basis—that has been frequently done elsewhere. My object this evening is rather to introduce a new Table which gives such a comparatively smooth life-line as to call for little or no aid from any theoretical process of graduation. As this is an Average Table—or, if I may so speak, a "blend" of several of the best known Mortality Tables—it will be necessary for me, in the first place, to refer to each of these, in order to a due appreciation of the basis on which it is constructed. This I shall endeavour to do as briefly and as simply as possible.

The Northampton Table was constructed about a century ago by the Rev. Dr. Price, from a record of the deaths of 4689 persons buried in the parish of All Saints, Northampton, during the 46 years 1735-80. Dr. Price, with these statistics, assumed 11,650 persons to enter upon observation at age 0 (or birth), and these he traced on to the end of life—the oldest attaining the age of 96. This Table, it will be noticed, was based upon a record of *deaths* only; which method is correct only on the supposition of the population being stationary (*i.e.*, that the births equal the deaths in number, and that there is no migration). Dr. Price admitted that the correct method by which to frame a Mortality Table is to compare the living with the dying at each age; but, for want of better material, he constructed his famous Table, as we have seen, from a record of deaths only. He was misled in supposing the population of Northampton to have been stationary, by omitting to observe that the ratio of christenings to births was reduced by the presence in that town of a large number of Baptists, who repudiate infant baptism. He “adjusted” his Table in anything but a scientific manner. The Bills of Mortality gave the numbers dying at each age between 20-30 greater than between 30-40, which Dr. Price thought was an accidental circumstance. He, therefore, for greater uniformity, took from the deaths at ages 20-30 and added them to those at 30-40, making certain additions at ages at and below 20. This Table, constructed in a manner which would not be tolerated now-a-days, has done good service during the greater part of a century. It is now almost entirely disused. It has been found that under it younger lives paid to Insurance Companies more than was fair, while older lives contributed too little. It also deceived those connected with such companies by requiring too small reserves, and consequently showing a greater apparent surplus or profit for distribution than actually existed. Generally, it indicated too high a rate of mortality. I find by calculation that, under this Table, one dies out of every 40 at all ages at and above 10. This Table gradually gave place to that which is known as

The Carlisle, which well-known Table was constructed about the beginning of the century by Joshua Milne, a London actuary, from observations made by Dr. Heysham of Carlisle. The error made by the divine in his Table is avoided by the physician and the actuary in the construction of theirs. They based their Table on the statistics of two enumerations (or censuses) of the popula-

tion of St. Mary's and St. Cuthbert's, Carlisle—the first of which was taken in January, 1780, showing a population of 7677 (3491 males and 4186 females), and the second in December, 1787, when the population was 8677 (3864 males and 4813 females)—and the recorded deaths in the nine years, 1779-87, which were 1840 in all (881 males and 959 females); but of these deaths 691 occurred at ages under 3 years. A feature of the population is shown by these two facts—viz., that the number of females at December, 1787, exceeded that of the males by nearly 1000 (about 25 per cent.); and that the number of persons at ages 20-30 (1501) exceeded that of those at ages 30-40 by upwards of 50 per cent. (991). This is altogether different from the experience of Life Assurance Companies, and may to some extent indicate its unsuitability for monetary calculations. For instance, in Life Assurance Companies, where the proportion of males to females is about 10 to 1, this Table understates the mortality likely to be experienced at the advanced periods of life. The deaths in each decennial period (20-90) ranged between 89 and 173 only—manifestly too few for the purposes of a reliable Mortality Table; hence the irregularities of this Table. This, and its faulty graduation, especially towards the end of the Table, render it necessary for the actuary to be cautious in its use—*e.g.*, the premium required to assure £1000 to be paid in the event of a life aged 45 dying within one year is, by this Table, actually 27s. more than for the same risk on a life aged 50! It may be asked, Why were the statistics of *Carlisle* selected on which to base a Mortality Table? I answer, because there lived in that city an eminent physician, a pioneer sanitarian, who was greatly interested in vital statistics. That, no doubt the prime cause, would not of itself, however, have made the Carlisle Table what it has been. Dr. Heysham's biographer says—"As a city of middle size [at the end of last century], the population of its two parishes being $\frac{5}{8}$ ths urban and $\frac{1}{8}$ th rural—its trading interests demanding a large proportion of operatives—its crowded lanes, like larger towns, favouring the spread of epidemics, small-pox, fever; and, lastly, but probably first in significance, its large infantile population. These circumstances conspired to make Carlisle a fair epitome of the borough and landed interests, *quoad* the general health of the kingdom." He further adds—"Every infectious and epidemic disease to which the human body is subject (the plague excepted) prevailed during this period in Carlisle." Mr. Milne, after drawing attention to the fact that the Carlisle rate of mortality had, during a period of 30

years, been nearly the same as throughout England, remarks "that, although the Carlisle Table has been constructed from observations made upon two parishes only, the law of mortality it exhibits probably differs very little from the general law that obtains throughout the kingdom, taking towns and the country together, if we except the children under 5 years of age, or, at most, those under 10. The practice of vaccination has happily rendered this exception unnecessary, but lives so young as these are seldom involved in any questions respecting the values of life interests, and vaccination can have no sensible effect upon the law of mortality that older lives than these are subject to. Consequently the value of any interests depending upon lives above 5 or 10 years of age, as deduced from the Carlisle Table, will agree equally well with the true values whether vaccination be practised or neglected."

This Table has proved of immense value in the calculation of life-contingencies; and from the large number of monetary Tables based thereon, it is likely to do so, to a greater or less extent, for many years to come. I find from the Blue Books that it is being used by about one-third of the Life Offices in this country. But it is gradually giving place to what is now considered the best Table for Life Assurance purposes—viz., that known as the Institute of Actuaries' Life Tables, to which I shall refer later on.

The Equitable Table was constructed in 1825 by the eminent actuary, Griffith Davies, of London. He derived his data from the annual addresses by the actuary to the members of the old Equitable Life Assurance Society (founded 1762). These gave 6344 lives and 1220 deaths—the mean number of lives under observation being 2522. As the Equitable Society assured very few lives below the age of 30, the data were incomplete. This Table is consequently of little or no use in dealing with lives at the younger ages. Another fault of this Table is that it is based on the statistics of *Policies*—not *Lives*—e.g., a member who happened to have two or three policies on his life with that Society was counted as if he were so many separate individuals.* This Table is not now much used. It was the result of the first effort to ascertain the rate of mortality among assured lives, and served a good purpose on that account. Later and very successful attempts have been made with the same object, and to these I

*. Say 10 policies on one life: when one dies, only one death is set against 10 lives!

shall refer further on. Meanwhile, I may remark that the statistics collected for this Table were made use of again in the first of these "Experience" or Actuaries' Tables. I find the deaths at all ages at and above 10 are 1 in 49, which is the same as the Carlisle, to which it bears a close resemblance.

The Government Annuitants' Tables are based on "Observations," published in 1829 by John Finlaison, the then actuary to the National Debt. These observations included 22,352 lives (9347 males and 13,005 females) and 10,077 deaths (4870 males and 5207 females), nominees of our Government Tontines and Life Annuity Funds from 1693 to 1825. The data here, you will observe, are greater than those on which any of the three preceding Tables referred to were based; but the lives are a special class. It is only, as a rule, on those lives whose prospects of longevity are considered very good that annuities are bought. Female annuitants are proverbially long-lived; and from my Comparative Table (Plate II.) it will be seen that they, according to the Government statistics, have a greater "expectation of life" than is indicated by any of the other Tables included in my comparison. It has been observed of these Tables:—"1. That the accuracy of the ages, whether recorded at entry to the particular scheme or at death, is unquestionable—the interests involved requiring and enforcing, under the eye of Government officials, the most perfect correctness in the details. 2. The Tables are free from disturbing elements operating against their adaptation to the purposes for which they are intended. There is no difference of climate or condition; and as regards employment, from the station of life of the parties, there can be no important variances in that respect. 3. There is no emigration or immigration, excepting what is rigidly ascertained, not only in individuals, but also in sexes and ages. 4. The number of lives involved is sufficient for practical purposes." These Tables are, however, not very reliable for young lives, seeing that annuities are seldom bought before middle life. These "Observations" were continued and brought down to date, and formed the basis of a new set of Tables, published in 1860. The two results are found to be very similar in their main features. No separate Table has, so far as I know, been calculated for "Persons." I have supplied one by the simple, though not strictly accurate, method of adding the sums under column headed "Males" to those under column headed "Females," and halving the result.

The English or National Life-Tables, of which there are three, were constructed by Dr. Farr, from data supplied by the Registrar-General's Returns.

No. I., published in 1843, was deduced from the numbers living at different ages in 1841, and from the deaths at the corresponding ages in the same year—that is, from the census enumeration of those living on 6-7th June, 1841 (15,914,148; corrected to 1st July, 1841, 15,927,867), and the Register of the deaths which occurred during that year. The population under observation was nearly 16 millions, of whom 49 per cent. (7,783,781) were males, and 51 per cent. (8,144,086) were females; and the deaths numbered 343,847, of whom 174,198 were males, and 169,649 were females.

No. II., which was published 10 years later (1853), was based on the same census returns as *No. I.*, with some slight corrections (population 15,929,834); but the deaths were those which occurred during the seven years 1838-44: 3 years before and 3 years after the census year 1841. These deaths numbered 2,436,648 (1,237,289 males, 1,199,359 females). Separate Tables are given for *males* and for *females*. I have added that for *persons*.

No. III., published in 1864, was constructed on a still wider basis than either of the two former National Tables. The census returns on this occasion were those of 1841 and 1851, embracing 33,912,341 lives (16,593,545 males, 17,318,796 females), and the deaths occurring during the 17 years 1838-54, which were 6,470,720 (3,283,255 males, 3,187,465 females). The data therefore included what was made use of in the Tables Nos. I. and II., and a great deal more. The results of these Tables are very much alike, as will be seen from the "Comparative View" (Plate II.). While these National Tables are of great value, from the vastness of the statistics—alike in area and in numbers—on which they are based, it must not be forgotten that, partly on that very account, they cannot be quite accurate in detail. For instance, when a death is registered it is not insisted upon that evidence of the age of the deceased be produced; and it is a popular belief that ladies, for example, do not in every case record their ages in the census papers with that rigid adherence to truth which is of so much consequence from a statistical, if not from a moral point of view.

The Old Experience (17 Offices) or Actuaries' Table was published in 1843. A large body of valuable statistics of *assured life* having accumulated in the Books of the various Life Assurance Companies, it was thought by the Actuaries that it would serve a useful pur-

pose if these statistics were carefully collected, and the combined experience of the offices ascertained and compared with the expectation, as indicated by the Tables of Mortality on which their calculations had been based. Accordingly, a Committee of Actuaries met in 1838, and arranged for the carrying out of the work. Seventeen offices contributed their statistics, of which the following is a summary:—There were in all 83,905 policies,* of which 44,877 were in existence at the date of the investigation; 25,247 had been discontinued; and 13,781 had been closed by death (of which, be it observed, less than 500 were on the lives of females). The Committee remark—"The materials from which the whole of the Tables now produced are formed represent a lower rate of mortality than can be expected to prevail in a longer period of time than that over which the present observations extend, for the average duration embraced in nearly one half of the experience is under $5\frac{1}{2}$ years; and taking the whole of the experience together, which includes that of the 'Equitable' and the 'Amicable'—two of the oldest offices [then] existing—the average duration of all the policies is not $8\frac{1}{2}$ years."

It has also been shown by this "experience" that "the mortality amongst females, taking all ages together, is greater than amongst males," which is the reverse of what is shown by the Government Annuitants' Tables, as might be expected, and that for obvious reasons.

The New Experience (20 Offices) or Institute of Actuaries' Tables, published in 1869, were deduced from the experience of 10 Scotch and 10 English Life Assurance Offices, up to Dec., 1863, collected and tabulated by the Institute and the Faculty of Actuaries. These 20 contributing offices include the best-known companies—the oldest of them had been 143 years in existence, and the youngest 18 years—40 years being the average age of the companies.

The statistics are as follow:—160,426 lives entered; of whom 26,721 had died; 45,376 had discontinued their policies; the policies on 88,329 lives were in existence at the date of the

* These Actuaries made the same mistake as was made with the "Equitable" experience, by counting *policies* as if each represented a *life*, whereas several policies might have been issued on one and the same life by one or more of the contributing offices.

investigation, 1,562,649 "years of life" were under observation—

	Per Cent. Died.		Per Cent. Discontinued.		Per Cent. Existing.
Males,	15·8	...	26·9	...	57·3
Females,	20·1	...	33·2	...	46·7
Total,	16·2	...	27·6	...	56·2
Old Experience (17 Offices),	9·7	...	27·6	...	62·7

The number of lives exposed to risk at and above age 60 was eight times that of the "Old Experience," while the number of deaths is nine times.

Various Tables have been deduced from this New Experience, viz.:—

H^{mf} that relating to healthy males and females (persons);
 H^m " " males only;
 H^f " " females only;
 $H^{m(5)}$ " " males only, excluding the first five years of assurance, by which time the benefit of "selection" is supposed to have worn off. These four form part of the basis of my Average Tables.

Besides these, there are the D^{mf} , that relating to diseased males and females—i.e., cases where, owing to personal defect or family taint, the normal rate of premium is inadequate to the risk of an assurance on the life; and E^{mf} that relating to cases where an extra premium has been charged to cover the additional risk of certain occupations and climates.

The Committee say that the H^{mf} (146,847 persons = 130,243 males, 16,604 females) may be fairly considered as the standard Table for life assurance; but the Institute has not made it the basis of any of their valuable monetary Tables. About one-third of the Life Assurance Companies are at present reported to be using these Tables (H^m , $H^{m(5)}$ and H^f). These will, doubtless, now be more generally used by the various offices, because, giving, as they do, the results of the experience of the past among *assured lives*, it is highly probable that they will indicate pretty accurately what may be experienced in the future.

And now, lastly, I add the experience of the *Manchester Unity of Oddfellows*. This experience, ascertained from the returns from the lodges composing the Unity for 1866-70, is said to be the largest hitherto collected of Friendly Societies in the

United Kingdom. The years of life under observation, 1,321,048, are nearly as many as were those of the Actuaries' New Experience; but as the period during which they were under observation is comparatively small (5 years only), the number of lives passing under observation was very much greater. This Table may be held to give a fair representation of the mortality prevailing among what are called the industrial classes, or rather the better sort of them—viz., those who avail themselves of the benefits of friendly societies. Nearly 6 per cent. (5.93 per cent.) of the persons included in these returns were miners and colliers. Some of the more important objections to Tables such as this are these:—(1) The population is generally a shifting one, because of the elements of which it is composed; (2) the lives are under observation for too short a time; (3) the withdrawals are out of all proportion to the deaths—*e.g.*, young lives retire from membership in large numbers, and in this way add their *vitality* to the Society for some time, leaving their *mortality* to be credited elsewhere.

As this Table commences at age 18, I have had to make an adjustment to throw it back to my common radix at age 10; and, as the Unity includes few members after age 83, an adjustment has also been made at the end of the Table.

It is on these ten Tables, then, that I have based the Average Tables—which I now submit to you. As these Tables commence with varying radices at different ages, my first business was to reduce them all to a common radix of 10,000 lives assumed to enter at age 10. Having done so, I arrived at the numbers in column headed *Persons* by adding together the numbers living at each age according to the following Tables, viz.:—Northampton, Carlisle, Equitable, Government Annuitants' (Persons), English, Nos. I., II., and III. (Persons); Old Experience, New Experience (H^{mf}), and Manchester Unity of Oddfellows, and dividing the sum by 10. That for *Males* was formed in a similar manner from the Government Annuitants' (Males), English, No. I., II., and III. (Males); New Experience (H^m) and $H^{m(5)}$, dividing the sums by 6. That for *Females* from the Government Annuitants' (Females), English, Nos. I., II., and III. (Females); and New Experience (H^f), dividing the sum by 5, thereby arriving at what I consider a good Average Table for *Persons*, *Males*, and *Females* respectively, based, as these are, on so great a variety of statistics relating to human life during the past two centuries.

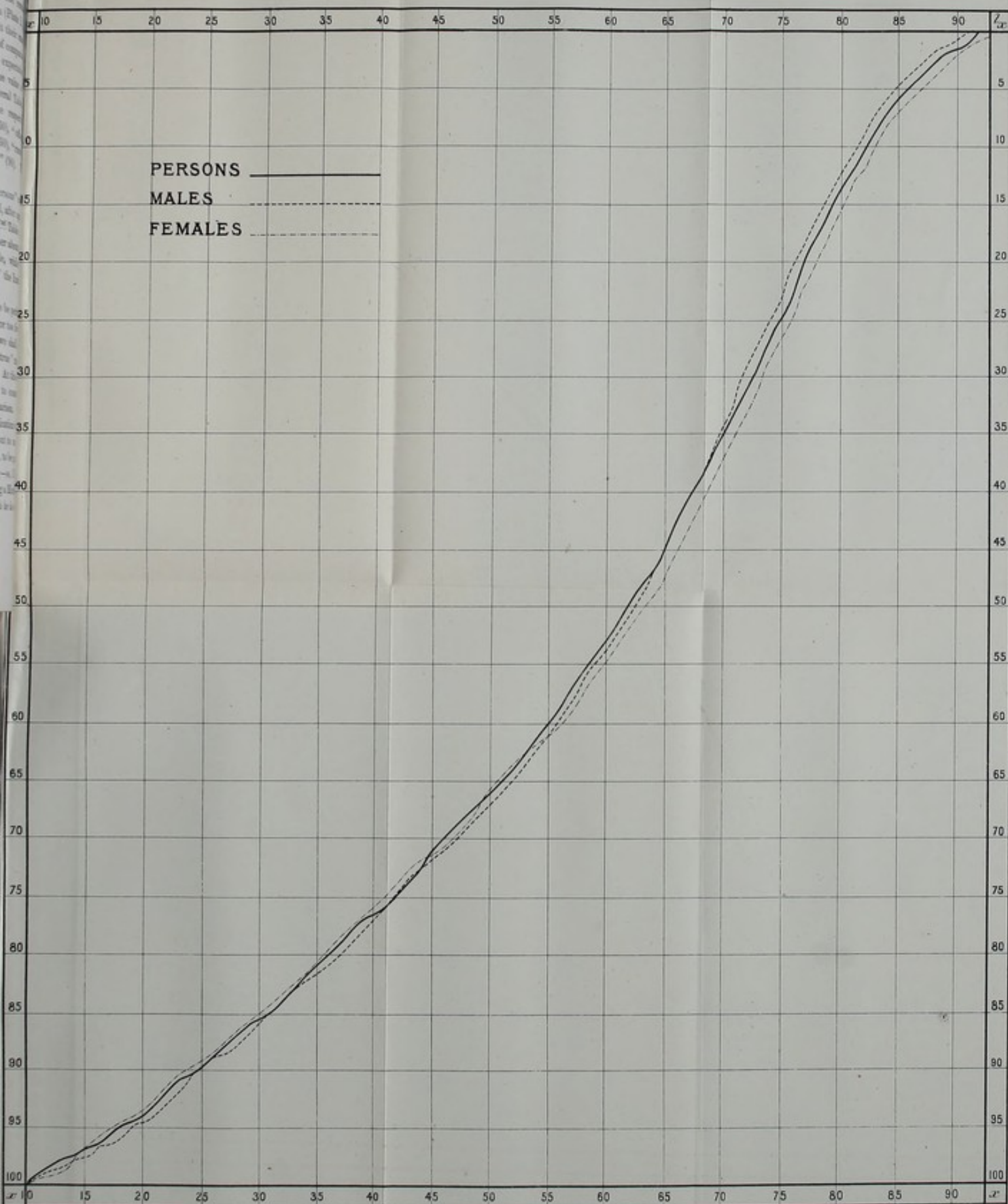
These data, as we have seen, include the rough, but tolerably accurate National Statistics of the Registrar-General, as well as the certified facts relating to lives on which depend pecuniary benefits—be they annuities, assurances, sickness or funeral allowances; statistics relating to lives selected by medical skill for assurance and friendly societies, and lives selected by themselves or others as being likely to prove profitable for investment by way of annuity; those relating to nearly all the provident classes, high and low, as well as to the community at large. The resulting life-lines, as you will see by referring to the diagram (Plate I.), are remarkably smooth. The Tables themselves exhibit their smoothness almost without the aid of a diagram. By way of comparison I invite your attention to the diagram showing the “expectation of life” (e_x), or, more correctly, the *after-lifetime*: the value of an annuity and of an assurance, according to the several Tables, at the periods of life which the Chinese designate respectively “youth expired” (20), “strength and marriage” (30), “officially apt” (40), “error-knowing” (50), “cycle-closing” (60), “rare bird of age” (70), “rusty-visaged” (80), and “delayed” (90). They call 100 years “age’s extremity.”

It will be found, I think, that my Table for “Persons” comes, on the whole, nearest to the English Life Tables, and, after age 45, is very like that of the Institute of Actuaries’ H^m Table; and the same holds good with regard to the males. After about 45 it comes nearest the Institute of Actuaries’ H^m Table, while that for females bears a very close resemblance to that of the Institute of Actuaries, H^f Table.

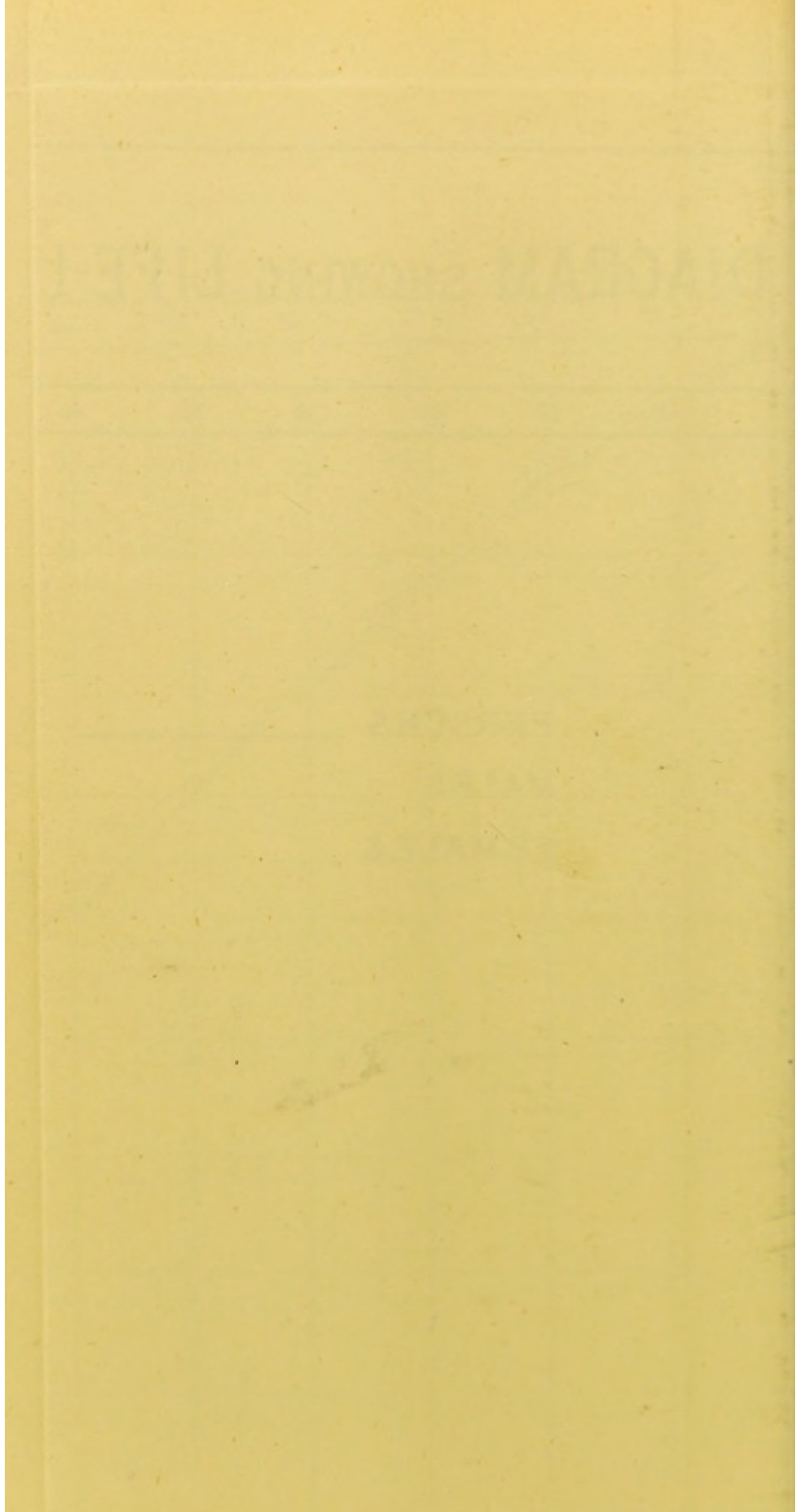
No Table of Mortality yet published can claim to be perfect—either the data on which it is based were unreliable or too few, or they were badly graduated. It is not likely that we shall ever get a Table showing what is technically termed a “true” rate of mortality. I do not claim perfection for my Table. At the same time I can hardly conceive a better basis on which to construct one for general monetary purposes or statistical comparison.

Our Secretary, Professor M’Kendrick, in a communication which he made at a recent meeting of this Society, pointed out to us how necessary it is for a surgeon, in selecting an anæsthetic, to be guided by the circumstances of the case he may be treating—so, I hold, must the actuary use his trained judgment in selecting a Mortality Table suited to the circumstances of the case with which he is called upon to deal.

DIAGRAM SHOWING LIFE-LINES DERIVED FROM AVERAGE TABLES.



Archibald
 Jan. 1881



Comparative View of the 'Expectation of Life' (e_x), Annuity (a_x) and Assurance (A_x) Values according to Various Tables of Mortality. Interest at 3 p.c.

Table	Age 20		30		40		50		60		70		80		90		Number of persons who will die between the ages																
	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	
Northampton	33.43	10.328	42.86	18.22	16.982	27.88	23.08	14.248	33.84	17.09	10.436	40.87	12.21	9.77	5.861	3.68	6.734	77.47	1.78	3.792	16.47	8.41	1.798	4.905	64	52	31	21	15	6	3	40	
Barbich	41.46	21.624	42.86	34.74	19.254	40.13	37.61	17.147	47.16	14.723	10.543	16.74	10.141	43.73	9.18	7.152	76.74	3.38	4.265	14.77	7.55	2.449	9.981	74	122	95	70	54	35	16	4	40	
Squibb	41.06	21.274	42.87	33.97	19.368	40.68	37.40	16.977	47.61	14.022	10.688	16.46	10.645	43.92	9.74	7.454	76.99	3.39	4.260	14.69	7.56	2.447	9.985	72	122	113	74	43	26	14	3	40	
Government Annuity-Plan	39.76			34.08			37.70																										
Male	37.40			38.87			35.50																										
Female	45.12			37.88			35.27																										
English Life-Plan	40.23						33.68																										
Male	39.58			37.47			33.73																										
Female	40.50			37.85			34.10																										
Male	37.25						33.61																										
Female	39.01			37.23			33.56																										
Male	40.65			37.82			34.26																										
Female	39.89						33.58																										
Male	39.48			37.61			33.74																										
Female	40.29			37.60			37.51																										
Old Experience (Office)	41.49			37.77			33.64																										
New Experience (Office)	45.00																																
Male	45.00																																
Female	45.00																																
Male	40.22			32.63			33.69																										
Female	40.22			32.63			33.69																										
Male	40.22			32.63			33.69																										
Female	40.22			32.63			33.69																										
Manchester Unity & Oldfellows	41.35			32.81			33.97																										
Average Tables - Boston	46.14			37.57			37.50																										
Male	39.78			37.50			37.50																										
Female	44.93			34.71			34.71																										

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AVERAGE TABLES.

NOTE.—*l.* = living; *d.* = dying.

Age.	PERSONS.		MALES.		FEMALES.		PERSONS.		MALES.		FEMALES.		Age.
	<i>l.</i>	<i>d.</i>	<i>l.</i>	<i>d.</i>	<i>l.</i>	<i>d.</i>	<i>l.</i>	<i>d.</i>	<i>l.</i>	<i>d.</i>	<i>l.</i>	<i>d.</i>	
10	10000	56	10000	54	10000	48	5283	164	5326	169	5479	143	60
11	9944	53	9946	45	9952	49	5119	171	5157	177	5336	153	61
12	9891	53	9901	43	9903	48	4948	174	4980	181	5183	157	62
13	9838	55	9858	45	9855	55	4774	180	4799	191	5026	166	63
14	9783	59	9813	48	9800	61	4594	184	4608	193	4860	175	64
15	9724	59	9765	45	9739	65	4410	188	4415	197	4685	180	65
16	9665	64	9720	52	9674	69	4222	192	4218	206	4505	186	66
17	9601	70	9668	63	9605	73	4030	196	4012	209	4319	192	67
18	9531	72	9605	70	9532	74	3834	202	3803	216	4127	202	68
19	9459	75	9535	75	9458	75	3632	207	3587	223	3925	208	69
20	9384	78	9460	83	9383	76	3425	209	3364	224	3717	212	70
21	9306	80	9377	89	9307	78	3216	212	3140	221	3505	218	71
22	9226	80	9288	91	9229	79	3004	215	2919	226	3287	223	72
23	9146	82	9197	90	9150	80	2789	219	2693	226	3064	225	73
24	9064	81	9107	88	9070	83	2570	218	2467	221	2839	229	74
25	8983	81	9019	86	8987	87	2352	215	2246	216	2610	227	75
26	8902	83	8933	87	8900	88	2137	210	2030	211	2383	224	76
27	8819	84	8846	88	8812	89	1927	203	1819	204	2159	223	77
28	8735	86	8758	85	8723	89	1724	193	1615	194	1936	211	78
29	8649	85	8673	84	8634	88	1531	185	1421	186	1725	197	79
30	8564	88	8589	84	8546	91	1346	177	1235	176	1528	195	80
31	8476	89	8505	87	8455	93	1169	167	1059	164	1333	181	81
32	8387	90	8418	86	8362	93	1002	152	895	147	1152	162	82
33	8297	89	8332	85	8269	90	850	140	748	128	990	153	83
34	8208	88	8247	84	8179	89	710	124	620	114	837	136	84
35	8120	90	8163	85	8090	88	586	112	506	103	701	121	85
36	8030	91	8078	90	8002	91	474	98	403	88	580	111	86
37	7939	95	7988	92	7911	94	376	83	315	71	469	96	87
38	7844	95	7896	94	7817	94	293	67	244	57	373	83	88
39	7749	97	7802	96	7723	94	226	57	187	48	290	74	89
40	7652	99	7706	96	7629	97	169	46	139	39	216	60	90
41	7553	99	7610	96	7532	95	123	37	100	30	156	44	91
42	7454	100	7514	97	7437	94	86	24	70	21	112	28	92
43	7354	102	7417	100	7343	94	62	20	49	16	84	23	93
44	7252	103	7317	99	7249	95	42	15	33	13	61	19	94
45	7149	104	7218	99	7154	98	27	10	20	9	42	13	95
46	7045	105	7119	102	7056	99	17	7	11	6	29	8	96
47	6940	107	7017	104	6957	101	10	3	5	2	21	7	97
48	6833	109	6913	107	6856	104	7	2	3	1	14	5	98
49	6724	113	6806	114	6752	103	5	2	2	1	9	5	99
50	6611	113	6692	117	6649	101	3	1	1	1	4	2	100
51	6498	118	6575	122	6548	100	2	1	...	...	2	1	101
52	6380	122	6453	126	6448	106	1	1	...	...	1	1	102
53	6258	126	6327	130	6342	109	...	...	...	...	...	...	...
54	6132	129	6197	132	6233	114	...	...	...	...	...	...	...
55	6003	134	6065	136	6119	121	...	...	...	...	...	...	...
56	5869	138	5929	142	5998	123	...	...	...	...	...	...	...
57	5731	144	5787	148	5875	129	ARCH. HEWAT, F.F.A.						
58	5587	149	5639	153	5746	132							
59	5438	155	5486	160	5614	135							

