MEDICAL STATISTICS

OF

LIFE ASSURANCE.

MEDICAL STATISTICS OF LIFE ASSURANCE:

BEING AN

INQUIRY INTO THE CAUSES OF DEATH AMONG THE MEMBERS OF THE

SCOTTISH AMICABLE LIFE ASSURANCE SOCIETY,

FROM 1826 TILL 1860;

AND A

COMPARATIVE ANALYSIS OF THE DISEASES WHICH HAVE PROVED FATAL AMONG THE ASSURED IN SEVERAL SOCIETIES, AND AMONG THE GENERAL POPULATION OF ENGLAND;

WITH REMARKS ON THE

MEDICAL SELECTION OF LIVES FOR ASSURANCE.

BY

J. G. FLEMING, M.D.,

FELLOW OF THE FACULTY OF PHYSICIANS AND SURGEONS;
MEDICAL ADVISER TO THE DIRECTORS OF THE SCOTTISH AMICABLE LIFE ASSURANCE SOCIETY.

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PREFACE.

A SEPTENNIAL INVESTIGATION into the affairs of the Scottish Amicable Life Assurance Society took place last year, and I considered it a good opportunity for instituting a Medico-Statistical Inquiry into the causes of death among the Members. My first intention was to confine my observations to the mortality which had taken place in that Society alone, and to attempt little more than a nosological enumeration. But as the subject opened up, it occurred to me that an inquiry on a more extended plan might be interesting and practically useful. The following pages then, are the result of a careful examination of what I have found written, and of some reflection and experience, on, the important bearings of Medical Science to Life Assurance.

The materials from which I have constructed the Tables were devoid of any uniformity in arrangement, based on different nomenclatures, and very defective on various points, indispensable to a complete and accurate investigation, of the subjects I have attempted to elucidate. Such as they were, however, I have endeavoured to make the most of them. But I am fully aware that many defects will be found in the following pages, inseparable from the imperfect data that exist, on the topics of which they treat.

A perusal of the Inquiry will show how much has yet to be done, in investigating many medical points of the greatest importance, both to assurers and Assurance Institutions. The question, for instance, of the influence and extent of hereditary

predisposition in producing diseases, has scarcely been inquired into, from a practical and statistical point of view. Our opinions as to how far certain diseases, such as Gout and Asthma, deteriorate the general health, and tend to shorten life, are vague and unsettled, because we have no well ascertained facts upon which to rest them. The tendency of some diseases to recur, the antagonism of one disease to another, the effects of climate, habits, temperaments, and many causes, moral and physical, in exciting diseases, and influencing them when excited, have not received that consideration from the medical profession which they require. The experience of Assurance Companies must afford ample means for obtaining accurate and really available knowledge on such points. All I have attempted to do is to clear the ground, and lay a foundation; others must lend a helping hand to advance and augment that knowledge of which we are in search.

Glasgow, *May*, 1862.

CONTENTS.

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THERE are few of the Institutions of this country which of late years have made greater progress than Life Assurance. It has not only become one of the most approved and frequent means by which a parent seeks to make provision for his family, but it enters into, and forms part of numerous transactions of commercial and ordinary life.

The success of the whole system depends on the natural duration of healthy human life in the aggregate; and the all-important duty of ascertaining how far an applicant for Assurance comes up to the requisite standard of health, necessarily devolves chiefly on the members of the medical profession. As a general rule, every applicant for an assurance on his life, is required to undergo an examination by a Physician or Surgeon appointed by the Society to which he applies; and, in addition to this, professional information is very often sought from the private medical attendant of the proposer, regarding his general health and any illness from which he may have suffered. On the statements in the reports thus obtained, the acceptance or rejection of the proposal mainly depends. The important and highly responsible duties of our profession, therefore, in reference to transactions, on which may hinge the comfort and happiness of parents and children, or on the carry-

ing out of which large pecuniary and complicated family or commercial arrangements may be involved, cannot be over-estimated.

The first and paramount duty of the Medical Adviser to a Life Assurance Society, is to guard the interests of the Institution for which he acts. The success of Life Assurance business chiefly depends on the selection of lives which are free from disease, and not more than usually liable to disease from personal constitution, hereditary predisposition, habits, occupation, previous attacks of illness, or any other cause. The delicate and often very difficult duty of weighing these points, and determining how far, in reference to them, an applicant ought to be accepted or declined, devolves on the Medical Adviser of the Institution. While never losing sight for a moment of his main duty, the protection of the Society for which he acts, he is bound to perform the important trust confided to him in a fair and liberal spirit—to exercise, in many cases, the functions of a judge as much as those of a counsel—and never to pronounce an opinion capriciously, and without sufficient and well-grounded reasons, upon the case of any one who applies to have his life assured. It is a very serious matter to any man to be declared ineligible for assurance.

All medical men of experience in assurance business know how frequently applicants present themselves for examination who are labouring under ailments of a slight and chronic character, or who have suffered from diseases, or may be liable, from hereditary tendency to diseases, regarding the effects of which, on general health and longevity, we have no very fixed or well-established medical principles or statistical facts to guide us. It is principally from accumulated experience and authenticated data, that we can expect to acquire such knowledge as will enable us to balance and decide equitably for all parties, to what extent, certain ailments, predispositions, and collateral circumstances ought to influence our opinion in the selection of lives.

In the following inquiry, while availing myself of the valuable materials which are at my disposal as Medical Adviser to the Directors of the Scottish Amicable Society, my endeavour shall be, by a careful analytical comparison of these, with such data of a similar character as have been published by several other Assurance Institutions, and with the mortality among the general population of England, to elucidate some doubtful points, and to direct attention, and I trust further investigation, to the influences of disease on the assuring classes of the community. The subject is a very important one. As already stated, many and great interests are involved in it, and hitherto it has been little inquired into.

Taken as a whole, the assured belong to the provident, the middle, and the upper classes of society, who, from their position, are able to procure the means of warding off sickness and of prolonging life; and being individually subjected to a medical examination before acceptance, they must be considered as selected lives. Under these circumstances, the rate of mortality among them ought to be lower than among the general population; and so it is in the aggregate. But the sequel will show that in some specific diseases and classes of disease, it is in excess of that of the community at large. One of my objects is, to ascertain the diseases in which this disparity occurs, to inquire to what extent it exists, and to investigate the causes on which it depends. By accurate and extended research on these points, we may hope to lay the foundation of that knowledge of which we are in quest.

I have constructed Tables so as to show the mortality from certain classes of diseases, and from some specific diseases among the population of England between 15 and 75 years of age,—the population being taken as at the middle of 1851, (a census year) and the causes of death on an average of the seven years 1848–54 as given in the Eighteenth Report of the Registrar-

General, p. 150. The propriety of excluding the population under 15 and above 75 years of age will be afterwards explained, but no just comparison could otherwise be made. In regard to the diseases, I thought it would give a fairer result, and counteract any deranging influences, such as epidemics, to adopt the average of the seven years about the middle of which the census was taken, than to calculate from the mortality of any one year.

As far as I am aware, no British Assurance Company has published any Table or Statement to show the proportionate mortality from classes of disease or from particular diseases, to the number of lives it had at risk.* This has only been done by the Gotha Life Assurance Society—one of the largest in Europe—and the results have been collated by Mr Neison, in his very elaborate work, "Contributions to Vital Statistics." 20,194 individuals had their lives insured in that office during the 11 years 1839–49, on which the sums of the numbers of lives exposed to risk during each year of age amount to 132,869.† Very elaborate and comprehensive Tables, exhibiting the experience of the Scottish Amicable Society for 34 years—1826 till 1860—have recently been prepared by Mr Spens, the Manager, and published by that Society. These Tables relate

* A Table has been furnished as an Appendix to Dr Begbie's last Report on the Widows' Fund, showing, "1st. The calculated number of lives at risk for the seven years from 31st December, 1852, till 31st December, 1859, arranged quinquennially, according to the age at the commencement of the septennial period; 2d. The number of deaths during the period," etc.; but, after repeated endeavours, I have been unable to adapt the information contained in this Table to my plan. An approximate estimate of the actual deaths from the different diseases, at different ages, drawn from this Table, and those expected according to the Registrar-General's Reports, has been prepared by Mr Spens, and will be found in the Assurance Magazine and Journal of the Institute of Actuaries, Vol. X., page 80.

† To illustrate familiarly what is here meant, I may mention that actuaries compute the number of lives by the number of years they have been assured. For instance, they reckon one individual insured for ten years the same as ten individuals for one year; which obviously amounts to the same thing.

to 10,255 individuals, and the sums of the number of lives exposed to risk during each year of age amount to 56,300. The calculations in this inquiry in reference to these Societies are made on these numbers, and the Tables will show the proportionate mortality from certain diseases and groups of diseases to the lives at risk in England, and the Gotha, and Scottish Amicable Societies.

Dr Begbie, Dr Christison, and Dr Burt, the Medical Officers to the Scottish Widows' Fund Society, the Standard Company, and the North British Company, have each published medico-statistical papers on the mortality experienced by their respective offices.* The reports on the Widows' Fund refer to 2,307 deaths which had taken place during 45 years—1815 till 1859; those on the Standard to 1299 deaths during 16 years—1845 till 1860; that on the North British to 1303 during 37 years—1823 till 1860. Mr Morgan, the Actuary to the London Equitable Society, published, as an Appendix to his valuable experience Tables, a Table showing the diseases of which the members of that Society had died during 32 years—1801 till 1832, which embraces 4095 deaths. All these papers contain interesting and practical information, but it is to be regretted that in none of them have the authors been furnished with the means of estimating the mortality on the number of lives at risk. The contributions by Dr Begbie, Dr Christison, and Dr Burt measure the number of deaths from particular diseases by the proportion each bears to the deaths from all diseases; while the Table of the Equitable Society shows simply the numbers who died of certain diseases at different decennial periods of life.

The method of estimating the deaths from any disease or

* Monthly Journal of Med. Science for January, 1847, and August, 1853; Edinburgh Medical Journal for June, 1859, and July, 1860; Report of the Standard Company for the year ending 15th November, 1860, Edinburgh Medical Journal for March, 1862.

group of diseases by the population or lives at risk, is evidently the one which furnishes the most eorrect and valuable deductions; our chief object being to ascertain the proportionate mortality from different diseases on the lives at risk, both generally and at specified ages. This the first division of the Tables will show, embracing England, the Gotha and Scottish Amicable Societies. Useful and interesting information is also obtained by estimating the mortality from any disease, by the proportion it bears to the mortality from all diseases; by this means we ascertain the proportion which the deaths from one disease bear to those of any other, or to those from all diseases. The second division of the Tables will accordingly show the proportion of total deaths from the different elasses of diseases, to the deaths from all causes in England and in the six Assuranee Soeieties; and also the proportion at different ages in England and the Gotha and Scottish Amieable Societies.

All systematie nomenclatures of disease are more or less arbitrary and open to reasonable ehallenge, aeeording to the medical or statistical theory through which they are viewed. It is well, however, to have one fixed for public purposes by a reeognised authority, and this has been done for us by the Registrar-General. The Classification and Nosology adopted in his annual reports are suffieiently detailed for all practieal purposes; and being now generally followed in statistical inquiries regarding disease and mortality, I have prepared the subjoined Tables in aecordanee with the arrangement we there find—thus facilitating referenee and comparison. For like reasons, I have adopted the same sub-divisions as to periods of age which we find in his reports and ealculations.*

* In the reports sinee 1857 some slight alterations in the distribution of a few diseases have been introdueed, but as these appear to me to be more fanciful and refined than praetieally useful, I have preferred to follow the nomenelature in use for many years prior to that period.

There are about 140 Societies and Companies carrying on the business of Life Assurance in the United Kingdom. I will not hazard a conjecture of how many individuals are assured by them, or of the number of deaths which must occur annually among the assured population. They must be very great, and afford a large field for observation and instruction. My endeavour is, however imperfectly, to open up the subject, and I trust it will be followed by many of the medical officers of Assurance Institutions. In a very few years ample data might be collected, from which valuable and interesting information, of great practical advantage to the community, might be obtained, and much of the doubt and difficulty which surrounds the medical selection of lives be cleared away. Without some uniformity in plan, however, much labour and research may be lost; and it would seem, at all events, to be desirable in future contributions—1st, That the sexes be distinguished; 2d, That the nomenclature of the Registrar-General be adopted; 3d, That the mortality be estimated on the lives at risk as well as on the mortality from all causes; 4th, That if decennial, not quinquennial, periods of age be selected, those of the Registrar-General be chosen, viz., 15 to 25, 25 to 35, and so on—not 20 to 30, etc. Whatever general system might be adopted, it cannot be expected to meet the approbation of all; but surely some sacrifice of individual opinion is worth making for the great benefit which would accrue from a uniform plan, at least in regard to leading points.

TABLE showing the TOTALS AT RISK, the NUMBER OF DEATH
AMICABLE SOCIET

TOTALS AT RISK,	2,349.		14,665.		19,330.		12,401.		5,682.		1,873.		56,300.		
AGES,	15 to 25		25 to 35		35 to 45		45 to 55		55 to 65		65 and upwards		All Ages.		
CAUSES OF DEATH. (Classed according to Registrar-General's Twentieth and previous Reports.)	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
I. Epidemic and Infectious Diseases—															
Small-Pox,	...	...	...	...	1	...	1	...	...	..	...	...	2	...	
Scarlatina,	1	...	...	...	...	...	...	...	...	...	...	...	1	...	
Diarrhœa,	...	...	1	...	...	...	...	...	...	1	3	1	4	2	
Dysentery,	1	...	2	1	2	...	1	...	2	1	1	...	9	2	1
Cholera,	...	...	4	...	8	...	4	1	6	...	1	...	23	1	2
Fever,	6	...	10	1	33	1	13	...	10	...	4	1	76	3	7
Do. Tropical,	...	..	1	...	3	...	3	...	1	...	...	..	8	...	
Influenza,	...	...	1	...	1	...	...	...	2	...	...	...	4	...	
Purpura,	...	...	1	...	...	...	...	...	...	...	...	...	1	...	
Erysipelas,	...	...	1	...	1	...	3	1	1	...	1	1	7	2	
Diphtheria,	...	...	...	...	1	...	...	...	...	...	...	...	1	...	
Puerperal Fever,	...	...	...	...	...	4	...	...	...	...	...	...	...	4	
II. Diseases of Uncertain Seat—															
Abscess,	...	...	1	...	1	..	...	...	...	...	...	...	2	...	
Hæmorrhage,	...	...	1	...	1	...	2	...	...	..	...	...	4	...	
Dropsy,	...	...	...	...	1	...	1	...	3	...	1	...	6	...	
Gout,	...	...	...	...	...	...	1	...	2	...	1	...	4	...	
Fistula,	...	...	...	...	1	...	...	...	1	...	...	...	2	...	
Cancer,	...	...	...	...	4	1	5	2	1	...	1	...	11	3	1
Tumour,	...	...	...	...	...	...	1	..	1	...	...	...	2	...	
Mortification,	...	...	...	...	...	1	1	...	...	...	...	...	1	1	
III. Tubercular Disease—															
Phthisis (or Consumption),	4	1	29	4	36	3	21	2	5	...	2	...	97	10	10
IV. Diseases of the Brain and Nerves—															
Apoplexy,	...	...	3	...	10	...	10	...	7	2	11	3	41	5	4
Paralysis,	...	...	2	...	3	...	5	...	7	...	9	...	26	...	2
Cephalitis,	...	...	1	...	5	...	2	...	...	...	...	...	8	..	
Disease of Brain,	...	...	1	...	10	...	8	...	9	...	9	...	37	...	3
Delirium Tremens,	...	...	5	...	3	...	...	...	...	...	...	...	8	...	
Epilepsy,	...	...	1	...	1	...	1	...	2	...	...	...	5	...	
V. Diseases of Heart & Blood-Vessels—															
Disease of Heart,	...	...	3	...	5	...	18	...	12	1	11	3	49	4	5
Pericarditis,	...	...	...	...	1	...	1	...	2	...	...	...	4	...	
Aneurism,	...	...	2	...	2	...	1	...	2	...	1	...	8	...	
VI. Diseases of Respiratory Organs—															
Pneumonia,	...	...	7	...	7	1	3	...	8	2	3	...	28	3	3
Bronchitis,	...	...	2	...	4	...	8	1	7	...	7	3	28	4	3
Pleurisy,	...	...	...	...	...	...	2	...	...	...	...	...	2	...	
Asthma,	...	...	1	...	...	...	3	...	...	...	2	...	6	...	
Hydrothorax,	...	...	1	...	...	...	1	...	...	...	...	...	2	...	
Laryngitis,	...	...	...	...	2	...	...	...	...	...	...	...	2	...	
Chronic Disease of the Lungs,	...	...	..	...	...	...	1	...	...	...	2	...	3	...	
Continued,	12	1	81	6	147	11	121	7	91	7	70	12	522	44	56

. the CAUSES OF DEATH, at different Ages, in the SCOTTISH
n 1826 till 1860.

TOTALS AT RISK,.....	2,349.		14,665.		19,330.		12,401.		5,682.		1,873.		56,300.		
AGES, ...	15 to 25		25 to 35		35 to 45		45 to 55		55 to 65		65 and upwards		All Ages.		
CAUSES OF DEATH. (Classed according to Registrar-General's Twentieth and previous Reports).	M.	F.	M.	F.	M.	F.	M.	F.	M.	F	M.	F.	M.	F.	Total.
Continued,.....	12	1	81	6	147	11	121	7	91	7	70	12	522	44	566
I. Diseases of Digestive Organs—															
Gastritis and Enteritis, ...	...	...	2	1	2	...	1	...	3	...	2	1	10	2	12
Disease of Stomach and Bowels, ...	1	...	1	...	4	1	4	...	2	..	4	1	16	2	18
Obstruction of Bowels, ...	...	...	...	...	...	...	2	...	1	...	2	...	5	...	5
Hernia, ...	...	...	...	...	1	...	...	...	1	...	...	...	2	...	2
Jaundice and Gall-Stones,.....	...	...	1	...	...	...	2	...	4	...	...	...	7	...	7
Disease of Liver, ...	...	..	4	...	8	4	13	...	11	3	6	...	42	7	49
Stricture of Œsophagus and Colon, ...	...	...	...	...	1	...	1	...	...	...	...	...	2	...	2
II. Diseases of Urinary Organs—															
Diabetes,.....	...	...	...	...	1	...	1	...	...	...	...	...	2	...	2
Disease of Kidney,.....	...	...	2	...	3	...	3	...	4	...	1	1	13	1	14
Calculus, ...	...	...	..	...	...	...	...	...	1	...	1	...	2	..	2
Hæmaturia, ...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1
Disease of Bladder, ...	...	...	...	...	...	...	1	...	1	...	...	...	2	...	2
Child-Bed Diseases, etc.—															
Hæmorrhage and Exhaustion, ...	...	...	...	...	...	3	...	...	...	...	...	..	...	3	3
Diseases of Joints and Bones—															
Disease of Bones, ...	...	...	...	...	1	...	1	...	...	...	...	...	2	...	2
Do. of Spine, ...	...	...	...	...	1	...	1	...	1	...	...	...	3	...	3
Rheumatism, ...	...	..	...	...	...	...	...	2	...	...	...	...	...	2	2
Diseases of Integumentary Tissues—															
Carbuncle, ...	...	...	1	...	2	...	...	...	...	...	...	...	3	...	3
Disease of Skin, ...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1
.. Malformations,															
II. Premature Birth, etc. (No Deaths.)...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
V. Atrophy,															
Gradual Decay & Senile Debility—	...	...	...	...	...	...	1	...	...	...	13	2	14	2	16
I. Cause of Death not ascertained—	...	...	1	2	4	...	7	..	2	...	2	...	16	2	18
II. Accidental Injuries, Suicides—															
Accidental Injuries, ...	1	...	8	...	8	...	3	...	3	...	2	...	25	...	25
Suicides, ...	...	...	1	...	3	...	3	...	...	...	...	...	7	...	7
Drowned, ...	2	...	1	...	3	...	3	..	1	...	...	...	10	...	10
Assassinated, ...	...	..	...	...	...	...	...	...	1	...	...	...	1	...	1
Total,.....	16	1	103	9	189	19	169	9	128	10	103	17	708	65	773

TABLE exhibiting in six decennial periods of age, A, the Population of England as at the middle of 1851, *between* 15 *and* 75 *years of age; also the Lives at Risk in the Gotha and Scottish Amicable Societies. B, The number of Deaths, from all causes, on an average of the seven years,* 1848–54, *in England, between* 15 *and* 75; *and in six Assurance Societies above* 15 *years of age.*

Ages.	A. Population and Lives at Risk.			B. Number of Deaths from all Causes.						
	England as at middle of 1851.	Gotha Society.	Scottish Amicable.	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	3,418,488	1,233	2,349	28,839	4	17	...	...	...	...
25 " 35	2,740,919	18,731	14,665	28,835	150	112	...	...	...	...
35 " 45	2,089,629	45,237	19,330	27,092	495	208	...	...	...	...
45 " 55	1,516,324	40,532	12,401	26,528	647	178	...	...	...	...
55 " 65	1,010,973	21,359	5,682	30,272	718	138	...	...	...	...
65 " 75	579,187	5,777	1,873	36,292	452	120	...	...	...	...
Total,..	11,355,520	132,869	56,300	177,858	2,466	773	2,307	1,299	1,303	4,095
							12,243			

I have not included the population or the deaths in England under 15 or above 75, because the assured lives under and above those ages are comparatively few; and I have not been able to find the population in the Gotha above 80. But the experience of the Scottish Amicable, from age 75 and upwards, and of the Gotha from 75 to 80, is entered above in the decade 65 to 75. The average ages of all the members of these Societies, included in the last mentioned decade, was, however, only about 70; so that the results cannot be far from correct. Throughout the following pages, when the population of England is referred to, it will be understood that the portion of it between 15 and 75 only, is included.

In the following Tables, the deaths from each class of diseases, and also from special diseases, are measured—1st, by the lives at risk, as given in division A, and, 2d, by the deaths from all causes, as given in division B, of the above. It would be cumbrous and superfluous to repeat these numbers with every Table, but reference will always be made to them.

TABLE exhibiting the Per Centage of Deaths, from all causes, on the Population of England, and the Gotha and Scottish Amicable Societies—B upon A of former Table.

Ages.	England.	Gotha Society.	Scottish Amicable.
15 to 25	0·843	0·324	0·723
25 " 35	1·052	0·800	0·763
35 " 45	1·296	1·094	1·076
45 " 55	1·749	1·596	1·435
55 " 65	2·994	3·361	2·427
65 " 75	6·266	7·824	6·406
Total,...	1·566	1·855	1·373

From the above Table it will be observed that, while the *total* mortality in the Scottish Amicable bears to that of England very much the proportion that might have been expected, that of the Gotha is considerably higher than either. This, however, arises, to some extent, from there being a larger proportion of more advanced lives in the Gotha. Had the lives at risk been in the same proportion as to ages in the Gotha and Scottish Amicable as in England, and the deaths in the same ratio as those of these two Societies respectively, the *total* percentages would have been, for the Gotha 1·404, and for the Scottish Amicable 1·334. The difference in the above results shows how necessary it is to examine carefully the component

parts with which we are dealing in drawing general deductions. Perhaps some actuaries might have preferred to state the *total* per-centage according to the method last explained, but neither could the results exhibited by this method always be relied upon as showing an accurate synopsis of the points under investigation. And one of my objects is, to point out the differences which exist between the special diseases of which the mortalities are composed in the general population and in the population of Assurance Societies. In stating the *total* per-centages, therefore, I have adhered to the ordinary and simple method, and deduced the *totals* from the actual figures before me; a principle, certainly, more readily understood, and in other respects attended with some advantages.

EPIDEMIC AND INFECTIOUS DISEASES (Zymotic).

CLASS I. OF GENERAL TABLE, Page 16.

Ages.	Number of Deaths from Zymotic Diseases.			Per Centage of Deaths from Zymotic Diseases.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	6,453	1	8	·188	·081	·340	22·37	25·00	47·05	...	...	...	...
25 " 35	5,570	48	23	·203	·256	·156	19·31	32.00	20·53	...	...	...	...
35 " 45	4,638	124	55	·221	·274	·284	17·11	25·05	26·44	...	...	...	...
45 " 55	4,001	131	27	·263	·323	·217	15·07	20·24	15·16	...	...	...	...
55 " 65	3,938	125	24	·389	·585	·422	13·00	17·40	17·39	...	...	..	...
65 " 75	3,925	72	13	·677	1·246	·694	10·81	15·92	10·83	...	...	...	...
Total,...	28,525	501	150	·251	·377	·266	16·03	20·31	19·40	14·30	12·54	14·35	11·94

From this Table it will be observed that the total mortality in this class, when measured by the lives at risk, has been nearly the same among the general population and the members

of the Scottish Amicable; while in the Gotha it has been greatly higher—Fever being the disease from which the excess almost entirely arose. The published Statements of the six Assurance Corporations, from which our deductions are taken, exhibit the diseases from which an aggregate of 12,243 deaths had occurred; of this number, the deaths from the above class were 1994, or 16·28 per cent, showing, on the whole, a slightly higher proportion of mortality from these diseases on the deaths from all causes among the assured, than among the general population, where it was 16·03.

FEVERS OF THIS COUNTRY.

Ages.	Number of Deaths from Fever.			Per Centage of Deaths from Fever.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848-54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	3,522	1	6	·103	·081	·255	12·21	25·00	35·29	...	...	...	...
25 " 35	2,131	33	11	·077	·176	·075	7·39	22·00	9·82	...	...	...	...
35 " 45	1,617	89	34	·077	·196	·175	5·96	17·97	16·34	...	...	...	...
45 " 55	1,388	86	13	·091	·212	·104	5·23	13·29	7·30	...	...	...	...
55 " 65	1,219	64	10	·120	299	·176	4·02	8·91	7·24	...	...	...	...
65 " 75	992	32	5	·171	·553	·266	2·73	7·07	4·16	...	...	...	...
Total...	10,869	305	79	·095	·229	·140	6·11	12·36	10·21	7·28	7·76	7·82	9·79

In regard to Fever, from which the largest number of the deaths in this class occur, we find the proportion to be considerably greater among the assured than the general community. The deaths from this disease to the lives at risk in the Gotha and Scottish Amicable combined being ·202 against ·095 the deaths in the general population, or rather more than double; and of the 12,243 deaths among the assured, 1156

were ascribed to Fever, being 9·45 per cent against 6·11 in England, or fully a half more.

This is a result for which certainly I was not prepared, and is quite at variance with the commonly received opinions as to the causes which give rise to Fever, and the class of society who are most liable to it, and does not easily admit of explanation. I have examined the Registrar-General's Reports for a number of years, and am satisfied that 10,869 represents a fair average of the annual deaths from Fever, between 15 and 75 years of age, including epidemic years; so that there is no ground for assuming that the epidemic influence was greater, during the periods over which the mortality among the assured extended, than during the average of the seven years from which the mortality among the general population has been taken.

Age is well known to exercise a marked lethal influence in Fever. The mortality from the Fevers of this country increases in a very decided manner as age advances. This is well illustrated by the division of the Table showing the mortality on the lives at risk, where the per-centage of deaths, excluding those under 25, increases steadily with age. That the young are greatly more liable to Fever than the adult, is plainly shown in the division exhibiting the per-centage on deaths from all causes, where, at the early ages, Fever appears to have been very fatal; but this is only in comparison with all other diseases at those ages, and demonstrates its great frequency as a disease in youth, but not its proportionate mortality to the number attacked. The deductions to be drawn from the two divisions of the Table are quite in accordance with the well known medical facts, that of an equal number of individuals attacked with Fever in early life, and in middle or well-advanced life, a much smaller proportion will die among the former than the latter; and also that the young are immensely more liable to the disease than the adult or aged. Were all ages equally subject to this disease as the young, the mortality from it would be dreadful.

In corroboration of the effects of age in increasing the mortality from Fever, I find from statistics which have been published by the late Dr Cowan, and by Dr Orr, Dr Steele, and Dr Adams, embracing 54,893 cases of various types of the disease treated in the hospitals and by the District Surgeons of Glasgow, that 36,620, being 67 per cent of those attacked, were under 30 years of age, the deaths among which were 1951, or 5·3 per cent; while above 30, the number attacked was 18,273, the deaths being 2383, or 13·04 per cent.

On an analysis of the proportion of the population at different ages in England between 15 and 75, I find that 30 per cent is between 15 and 25, and 70 per cent above 25; while in the Gotha 99, and in the Scottish Amicable 96 per cent, are above 25. Or in round numbers, one-fourth more of the population of these Assurance Societies is above 25, than of the general community, and consequently this additional number is exposed to the risks of those diseases which are more fatal to advanced than young lives; and it having been shown that Fever is one of these, the extra mortality from this disease among the assured is to some extent accounted for. Probably also, the classes of society from which the members of Assurance Corporations are obtained, are not so much exposed to the causes, and do not suffer to the same amount from Fever among their young, as the general population, and a larger proportion of them may be attacked by the disease at a more mature age; besides, there are good grounds for the opinion, that Fever is a more fatal malady among those who enjoy the comforts and indulge in the luxuries of life, than among those whose means command little more than its necessaries, or those who are rarely free from its privations.

Under the general term "Fever" in the Tables of the Scottish Amicable Society, all the continued Fevers of this country are included. In the certificates of death these have been returned as Typhus, Typhoid, Low Nervous, Gastric, Enteric, and

Bilious. They were the cause of 79 deaths, besides which there were 8 from Fever in the tropics, being 87 in all, or 11·25 of the total deaths, and 58 per cent of the deaths from this class. Of the 79 which occurred in the United Kingdom, 30 were returned as Typhus, and this I believe to be under the actual number, as several are simply termed Fever, which, from the shortness of their duration, I have no doubt were of this type. Eleven of these 79 are stated in their proposal papers to have previously had the disease; and of the 8 lives which fell from Fever abroad, 7 were reported to have suffered from it in the tropics previous to acceptance. This is to some extent a corroboration of the opinion, that in certain constitutions there is a tendency to febrile diseases. On the other hand, the question of how far, having passed through an attack of certain fevers, Typhus, for instance, gives an immunity from that disease is a point of practical importance, and if conceded, should in so far enhance the value of such a life. Typhus Fever is now classed by most physicians among the exanthemata, is considered to be characterised by a distinct eruption, and, like the Eruptive Fevers, to occur only once in life, in which opinion, from considerable opportunities of observation, I fully concur. The circumstance of Fevers being much more common among the young than the middle-aged, also tends to support this opinion.

From what has been shown as to the extra mortality from Fever among the assured, and bearing in mind that it is a disease to which the healthy and vigorous are liable, and that medical science affords little or no aid in detecting who are most likely to be its victims, it must be expected, particularly during epidemics, to fall heavily on Life Assurance business.

The following case of death from Fever is worth recording, as illustrating the benefits of Life Assurance, and medically as showing how long the contagious poison of Typhus may lurk

in the system before the decided symptoms of the disease are developed. A gentleman who had been for many years assured in the Scottish Amicable applied for an additional policy. On examination he was found free from disease, and in regard to his bodily health quite eligible, but there was a depression and anxiety in his countenance, manner, and conversation, which I considered to be satisfactorily accounted for when he mentioned that he was in deep distress from the death of his wife by Fever the previous week. The proposal was accepted. This occurred on Wednesday; he attended to his business as usual till the end of the week, and was at church on Sunday, on the evening of which day he had a shivering fit, followed by feverish symptoms, but went out on Monday, after which Typhus Fever supervened, and he died within a fortnight.

CHOLERA, DIARRHŒA, AND DYSENTERY.

Ages.	Number of Deaths from Cholera, etc.			Per Centage of Deaths from Cholera, etc.										
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.							
	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	1,436	0	1	·042	·000	·042	4·97	0·00	5·88	...	...	...	...
25 " 35	2,145	3	8	078	·016	·054	7·43	2·00	7·14	...	...	...	...
35 " 45	2,138	15	10	·102	·033	·051	7·89	3·03	4·80	...	...	...	...
45 " 55	2,032	25	6	·134	·061	·048	7·65	3·86	3·37	...	...	...	...
55 " 65	2,061	24	10	·203	·111	·176	6·80	3·34	7·24	...	...	...	...
65 " 75	2,068	18	6	·356	·311	·320	5·69	3·98	5·00	...	...	...	...
Total...	11,880	85	41	·104	·064	·072	6·67	3·44	5·30	4·07	6·83 *	3·99	1·48 †

* This does not include the last quinquennium.

† Includes 1832 only, not the severe Cholera epidemics since that year.

Next to Fever, the most fatal diseases in the Zymotic group are—*Cholera, Diarrhœa, and Dysentery.* But the mortality from them is considerably lower than among the general population.

By the preceding Table it will be observed that the deaths from these diseases to the lives at risk in the Gotha were somewhat lower than in the Scottish Amicable; combined, they give ·066 against ·104 the proportion in the general population, and 7566 deaths in five Assurance Offices (the Equitable not being included) give 321 deaths from these affections of the bowels, being 4·24 per cent against 6·67 in the general community of England; which is, in both cases, about a half in favour of the assured.

Of the 41 deaths from these diseases in our Society, 13 males and 4 females fell from Diarrhœa and Dysentery, one of them being a West Indian risk; 23 males and 1 female from Cholera. The Society did not experience any death from this disease during its first visitation to this country in 1831–32, but 8 occurred during the epidemic of 1848–9; 3 in 1850, in the West Indies; 10 at home and 2 abroad in the epidemic of 1854–55; and 1 in India in 1846. It is remarkable that in only one instance is the duration of the attack reported as having exceeded 48 hours.

ERYSIPELAS.

	Number of Deaths from Erysipelas.			Per Centage of Deaths from Erysipelas.									
				On Lives at Risk.			On Deaths from all Causes.						
	England.	Gotha.	Scot. Amic.	England.	Gotha.	Scot. Amic.	England.	Gotha.	Scot. Amic.	Wid. Fund.	Standard.	North Brit.	Lond. Equit.
Total,	1245	17	9	·011	·012	·015	·70	·60	1·16	1·17	*1·25	·92	·63

* Last Quinquennium not included.

The Gotha and Scottish Amicable combined give ·013 on the lives at risk against ·012 on the population of England—a very trifling difference. The deaths from Erysipelas among the assured were 100 out of 11,661, being ·85 against ·70 among the people of England generally. The excess, it will be observed, was entirely among the assured in the Scottish offices. In England, the Gotha, and the Equitable, the deaths from this disease to the total deaths are pretty nearly in the same proportion.

In the Scottish Amicable mortality, Erysipelas was the cause of 9 deaths—7 males and 2 females. In 4 of the cases, the head and face was the seat of the disease; in 5, the parts affected are not mentioned in the return. There can be no doubt that in some individuals there is a constitutional tendency to attacks of Erysipelas, and such persons are certainly not admissible to assurance on the usual terms. In none of our cases do the papers bear any reference to a previous attack, or any tendency thereto. It may be remarked that none of them appear to have supervened on any wound or surgical operation. Both the females fell within a year of their acceptance, while the males survived various periods, from two to twenty-eight years.

The statistics of the Insurance Societies do not enable me to classify and draw any conclusions as to the deaths from *Puerperal Fever*, and maladies incident to child-birth. The Scottish Amicable had 4 deaths from the first, and 3 from the last cause, which gives a per-centage of ·154 on 4518, the number of female lives at risk, and of 11·11 on 63, the number of female deaths. It is worthy of remark that 3 of the 4 deaths from Puerperal Fever occurred within five months of each other, viz., from July to November, 1858. The Registrar-General observes in his Report for 1858, p. 209, "That the mortality of women in child-bearing had happily grown almost constantly less in a series of years, 1848–57—the proportion of mothers

who died having declined from 61 to 42 in 10,000. In 1858 the proportion rose again to 48."

The deaths from *Small Pox* in the Gotha and the Scottish Amicable were 2 each, which, on their combined populations, gives the very small per-centage of ·002, while in England it is ·006, being about equal to 2 in 100,000 assured lives, and in England to 6 in the same number. Among the assured the deaths from this disease were 13 in 12,243, being 1 in 941, while in England they were 1 in 276, or ·10 per cent of the assured deaths to ·36 of the population deaths. Of the two members of the Scottish Amicable Society who fell from Small Pox, one was a clergyman, the other a wine merchant, who died while travelling in Spain, so that it is not improbable that both of them had been exposed to the contagion of the disease. Nothing could demonstrate more forcibly the blessings of vaccination than the low mortality from Small Pox. How different it would have been before Jenner's discovery. It ought to be distinctly ascertained that all applicants for Life Assurance have been successfully vaccinated.

As in Small Pox, the deaths from *Scarlet Fever* among the assured are too few to allow of any comprehensive deduction. As far as they go, they show a per-centage of ·002 among the assured to ·005 in the population, being about equal to 2 in the 100,000 insured, to 5 in the same number of the population. The deaths from this disease to the total deaths among the assured were 24 out of 7566, or ·31 per cent, nearly the same as the general population where they were ·32.

There is only one death reported from *Diphtheria*—a gentleman aged 43. He died in December, 1859. This disease appears to be becoming established in this country, and though very fatal among children, it does not seem to attack adults

frequently, so that I do not suppose the mortality among the assured is likely to be much affected by it.

As already remarked in reference to Fever, the mortality from epidemic and contagious diseases will vary much as to whether or not they prevail epidemically. It is chiefly to counteract the exciting causes, and check the spread of this class of diseases, that the great efforts in sanitary improvements have of late years been directed. It may reasonably be hoped that any benefits which accrue therefrom will be favourable to Life Assurance Institutions, inasmuch as disease may thereby be lessened and human life prolonged. Meantime, so far as can be inferred from the experience of the Scottish Amicable, it seems probable that there will be no great difference in the mortality arising from epidemic and infectious diseases among assured lives and the general population. But this equality will not depend on the various diseases being fatal in the same ratio; for, while there will be a considerable excess among the assured from Fever, this will be balanced by a diminution in the mortality from Cholera, Diarrhœa, Dysentery, and the other diseases of the class.

DISEASES OF UNCERTAIN SEAT.

CLASS II. OF GENERAL TABLE, PAGE 16.

AGES.	Number of Deaths from Diseases of Uncertain Seat.			Per Centage of Deaths from Diseases of Uncertain Seat.								
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.					
	England, Average of seven years, 1848-54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	North British.	London Equitable.
15 to 25	708	0	0	·020	·000	·000	2·45	0·00	0·00	...	...	...
25 " 35	1,119	11	2	·040	·058	·013	3·88	7·33	1·78	...	...	...
35 " 45	1,876	56	10	·089	·123	·051	6·92	11·31	4·80	...	...	...
45 " 55	2,779	95	13	·183	·234	·104	10·47	14·68	7·30	...	...	...
55 " 65	3,702	138	8	·366	·646	·140	12·22	19·22	5·79	...	...	...
65 " 75	4,353	80	3	·751	1·384	·160	11·99	17·69	2·50	...	...	...
Total...	14,537	380	36	·128	·285	·064	8·17	15·40	4·65	6·54	9·97	10·42
Exeluding Dropsy	6,800	148	30	·060	·111	·053	3·82	6·00	3·88	5·80	6·37	4·15

The Reports of the Standard Company do not furnish the means of comparison in this Class.

In the Reports of the Registrar-General, and till of late years in almost all records of causes of death, "Dropsy" is found as an independent disease. The mortality from it has always amounted to fully more than a half of this class; but being almost invariably a consequence or symptom of disease in some important organ of the body, and very rarely a primary or idiopathic disease, when it appears in a correct pathological nomenclature, the number of deaths ascribed to it ought to be very few. Out of 3799 deaths, the causes of which are reported by the Scottish Amicable, Widows' Fund, and Standard, only 36 are ascribed to Dropsy, being less than 1 per cent; in the North British, 46 out of 1303 deaths, or 3·53 per cent; in the Gotha Society, 232 out of 2466, or 9·38 per cent; and in the London Equitable, 257 out of 4095, or 6·27 per cent. In England, out of 177,858 deaths between 15 and 75 years of age,

7737 are put down to Dropsy and Ascites, being 4·35 per cent. It is obvious that such varied results must depend on a difference in the mode of making up the returns. The explanation is evidently that already referred to, viz., Dropsy being classed in the Registrar-General's Reports, and by some of the Assurance Societies, as a primary disease, instead of a consequence of the diseases of the liver, heart, or kidneys. Of late years, I have no doubt "Dropsy" has very rarely been returned to Assurance Offices as a cause of death, and that in future the cases ascribed to it will be much more numerically correct. The exclusion of Dropsy, however, as an independent disease, will make a marked diminution on the rate of mortality from this class, and increase that from the diseases of the organs to which it will be correctly referred.

In a comparative inquiry into the causes of death among the assured in different offices, and also with the general population, it appears to me that the most correct method will be to allot as far as possible the deaths reported from Dropsy, to the organs from disease of which this symptom resulted. In order that I might do this with some degree of accuracy, or, at least, on some system, I have collected from the Annual Reports of the Glasgow Royal Infirmary the number of cases of Dropsy ascribed to the different organs for ten years, during which period they are distinguished from each other, and find them to have been as follows:—

Anasarca and general.	Cardiac.	Hepatic.	Renal.	
106	273	198	282	- TOTAL, 859.

In my opinion a considerable proportion of the cases put down as "Anasarca and general" would depend on diseases of the liver or abdominal viscera; and if I am correct in this, the proportion to be ascribed to each organ will be about equal, and such, particularly among the assured class, I believe to be the case; and in making any calculations as to the mortality from diseases of the heart, kidneys, liver and abdominal viscera,

in the after part of this paper, I shall proceed on the assumption that the cases reported as Dropsy by the Registrar-General and the Assurance Offices depended on diseases of these organs in equal proportions.

On referring to the Table, it will be observed that I have added a line giving the results with Dropsy excluded. A considerable disparity even then exists in the different mortalities, but it is by no means so great as in the line with Dropsy included. The deaths in England and the Scottish Amicable, excluding Dropsy, were very nearly in the same proportion, both on the lives at risk and the total deaths; and while the proportions in the other Assurance Societies are somewhat higher, they still bear a fair relative ratio to each other. The aggregate deaths from this class among the assured, excluding Dropsy, were 523 out of 10,949, or 4·77 per cent., against 3·82 in England.

Malignant or Cancerous diseases are those of this class which fall most heavily on Assurance Companies, but as the number of males assured is very greatly in excess of that of females, and as Cancer is nearly three times more fatal to females than males—the proportion being 18 to 7—it is evident that any calculation deduced from a comparison of the deaths from this disease among the general population, and among the assured, can be of little value. None of the Assurance Societies except the Scottish Amicable distinguish the sexes. Taking them combined, however, we have the following result as to

MALIGNANT DISEASES.

	Number of Deaths from Malignant Diseases.			Per Centage of Deaths from Malignant Diseases.								
				On Lives at Risk.			On Deaths from all Causes.					
	England.	Gotha.	Scot. Amic.	England.	Gotha.	Scot. Amic.	England.	Gotha.	Scot. Amic.	Wid. Fund.	Standard.	North Brit.	Lond. Equit.
Total,	4648	70	14	·041	·052	·024	2·61	2·83	1·81	1·69	2·07	1·91	1·05

In England, on males alone, the per-centage on lives at risk was ·023, and in the Scottish Amicable ·021. Out of 12,243 deaths among the assured, 218, or 1·78 per cent, were from Malignant Diseases, against 2·61 in the general population.

Fourteen deaths occurred among the members of the Scottish Amicable, from well ascertained forms of Malignant Disease; in all of these the certificate of death states the specific character and the seat of the disease. In two of the females the disease was in the womb, in the other in the breast. In five of the males, in the stomach or bowels; in the others the seats were variable. They form 1·81 per cent of the general mortality, but not unlikely some cases returned under other names, particularly as disease of the stomach and bowels, and disease of the liver, were of a malignant character. The two cases of tumour, one of which is certified as a tumour on back causing paraplegia, the other as a tumour in the pelvis, were not unlikely malignant, as also the two cases of stricture of the œsophagus and of the colon. It is often difficult positively to diagnose during life the exact nature of internal disease, and in the rank of life to which the majority of assured persons belong; *post mortem* examinations are not frequently sought, and often obtained with difficulty.

Cancer, in its varied forms, is essentially a disease of middle life, for though cases do occur under twenty, they are rare. A very large proportion of those attacked are above thirty-five, consequently it is a disease from which Assurance Societies must expect a considerable amount of their mortality. Twelve of our fourteen deaths from this disease occurred between thirty-five and fifty-five.

The consideration of the question whether Cancer is hereditary, and if so, to what extent, is a point of great importance in Life Assurance. Mr Paget has examined this subject in 411 cases of tumours of all descriptions, which fell under his own

notice.* Of these 254 were cases of Malignant or Cancerous disease, and 60 of these, 23·6 per cent, had relatives of the same or former generations, who had been the subjects of Cancer. Of the remaining 157 who were affected with tumours of various descriptions but not considered malignant, 31, or 19·74 per cent, had relatives of the same or former generations, with cancerous or other tumours. I presume, though Mr Paget does not state so, that a considerable proportion of these were hospital patients—a class who very often know little of the diseases of their relatives, so that the above numbers of 60 and 31 are by no means likely to embrace all the cases, where Cancer or tumours had appeared among the relatives of the 411. They are quite sufficient, however, to make us guarded, and to call for a minute examination on this point, into the family history of applicants for assurance, who have lost relatives from malignant disease, or indeed who have suffered from tumours of any description. The papers of the fourteen lives which fell from Cancer in the Scottish Amicable, do not show that any of them had lost relations from Cancer.

In *Gout,* the numbers are too limited for any deduction of much value; as far as they go, they show a mortality from this disease of 2 in England, 26 in the Gotha, and 7 in the Scottish Amicable for every 100,000 lives. Out of the 12,243 deaths among the Assured, 93 or ·76 per cent were from Gout, against ·11 in the general population. While the above shows very distinctly that the assured are drawn from the classes of society, among whom Gout proverbially prevails, it by no means gives a true estimate of its lethal power. Very few Gouty persons die from direct attacks of the disease, and consequently their deaths are ascribed to other causes. But the poison of Gout in the system is the cause of many anomalous and metastatic ailments,

* Med. Times and Gaz., August 22d, 1857.

and not only renders the patient more liable to disease, in various forms, than he otherwise would be, but less able to resist disease when attacked by it. The question of the influence of Gout on longevity has yet to be solved.

Of the four members of the Scottish Amicable Society whose deaths were ascribed to Gout, only one is admitted in the proposal papers to have suffered from it previous to acceptance, namely, the gentleman who died at 76; nor do any of them appear to have had a hereditary predisposition to the disease. One of them (the gentleman aged 62) died of a few days' illness from retrocedent Gout, in the form of acute pain, with complete obstruction or paralysis of the bowels.

The other diseases in this Class do not require any special notice.

Class III.—CONSUMPTION.

Ages.	Number of Deaths from Consumption.			Per Centage of Deaths from Consumption.										
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.							
	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	12,482	1	5	·365	·081	·212	43·28	25·00	29·41	...	...	...	...
25 " 35	11,982	45	33	·437	·240	·225	41·55	30·00	29·46	...	...	...	...
35 " 45	8,502	119	39	·406	·263	·201	31·38	24·04	18·75	...	...	...	...
45 " 55	5,380	128	23	·354	·315	·185	20·28	19·78	12·92	...	...	...	...
55 " 65	3,166	91	5	·313	·426	·088	10·45	21·67	3·62	...	...	..	...
65 " 75	1,326	18	2	·228	·311	·106	3·65	4·00	1·66	...	...	...	...
Total,....	42,836	402	107	·377	·302	·190	24·08	16·30	13·84	7·80	11·70	8·21	8·27
With Diseases of Respiratory Organs combined,	62,960	653	185	·555	·490	·328	35·39	26·47	23·93	20·67	23·87	21·10	20·72

CONSUMPTION.

This Class, in the reports of the Registrar-General, under the name "Tubercular diseases," includes Scrofula, Tabes Mesenterica, Hydrocephalus, and Consumption, but as deaths from the three first are very rare—scarcely appreciable among the assured—the calculations are made on Consumption alone. Of all diseases, this is the one which Assurance Companies most dread, as from it the greatest amount of premature mortality occurs.

Great as the mortality from Consumption is among the assured, it falls far short of that in the general population, whether estimated on the lives at risk, or on the deaths from all causes. By the first method, the mortality among the members of the Scottish Amicable has been, as nearly as possible, one-half of that experienced in the community at large. The Gotha does not compare so favourably, but the reason for this will, to some extent at least, be explained hereafter. Of the 12,243 deaths among the assured, 1287 were ascribed to Consumption—being 10·51 per cent against 24·08 in the population of England, or about 1 in 9 of the deaths among the assured, and 1 in 4 of those in the general population.

A result so favourable to Assurance Societies, naturally leads to inquiry as to the causes to which it may be ascribed. The following appear to me to be those most deserving of notice:—1st. A very large proportion of the victims of Consumption are under 35, and the number of members of Assurance Societies under that age, is small as compared with that of the general community. Of the population of England between 15 and 75, 54 per cent are between 15 and 35; of the Scottish Amicable, 30, and of the Gotha, only 15 per cent are between these ages; so that the population of Assurance Institutions is so apportioned that a comparatively large proportion of it is beyond the age at which Consumption is most lethal. 2d. Consumption is a

disease to which the working and lower orders of society, who constitute a very large proportion of the population, are more liable, in early life at all events, than the assuring class. They are exposed to many more of the exciting causes of the disease, such as cold, exposure, privations, unhealthy occupations, neglected illnesses, and when a hereditary tendency exists, are by no means so favourably circumstanced for employing, or obtaining means to counteract its influence. 3d. Many deaths from Consumption are undoubtedly saved to Assurance Societies, through the medical examination to which applicants are subjected. There is perhaps no disease, to the detection of which, or any tendency thereto, either personal or constitutional, the medical examiner is more alive; and, if we except diseases of the kidney, there is none in the diagnosis of which medical science has of late years made more progress, by directing attention to early and insidious symptoms, and devising methods for detecting them. 4th. Besides the above, many individuals who would willingly effect assurances on their lives, are deterred from proposing, knowing that they would most probably be declined on the grounds of family history. So that, heavy as the mortality from Consumption may be among the assured, it is small when compared with that of the general population; and Assurance Companies may congratulate themselves that they have so many protecting influences from a disease which carries off about a fourth of the population between 15 and 75 years of age.

A point which at once attracts attention is the high rate of mortality experienced by the Gotha, when estimated by both divisions of the Table, and also the large proportion of deaths at advanced ages—evidently showing that the calculations have been made from data, different than those of the other Assurance Societies. The explanation appears to me to depend on the circumstance of Consumption and Bronchitis not having been discriminated, but classed as one disease. This, I think, will

be admitted when I mention that out of the total mortality of 2466, only 9 are ascribed to Bronchitis. It also satisfactorily explains the apparent large number of deaths, as from Consumption, at advanced ages. Those deaths no doubt arose from Bronchitis, which is essentially a disease of middle and old age. The same remarks apply to the Table of the London Equitable, where Bronchitis and Consumption are evidently classed together under "Consumption."

It will be observed that the returns of the mortality from Consumption, when measured by that from all causes, vary greatly in the different Assurance Societies, from 7·80 in the Widows' Fund, to 16·30 in the Gotha; or, if we compare the British Corporations alone, we find a difference of 6 per cent between the Widows' Fund, which is the lowest, and the Scottish Amicable, which is the highest—the first giving 7·80, the latter 13·84. No doubt the circumstance of the Widows' Fund being an older institution than the other, may partly account for this, for, as the members advance in life, a greater number of them will die from diseases incident to age, and consequently lessen the proportion of deaths from the diseases incident to early life. Still, the disparity is too great to be accounted for by this cause alone, and must, I think, to some extent, depend on vague or inaccurate returns as to the causes of death. Dr Begbie, for instance, in his last report on the Widows' Fund, gives the deaths from Consumption at 180 out of 2307, and concludes a full list of diseases of the organs of Respiration with "Disease of Lungs, 67." I confess I am somewhat at a loss to make out what diseases of the lungs or their investing membranes, other than those he enumerates, could produce so many deaths. The same remark applies to Dr Burt's report on the North British, which gives 34 deaths out of 1303 from "Disease of Lungs," besides a full proportion from six specific diseases of these organs. A return, in similar terms, was by no means unfrequent to the Scottish Amicable;

but, on careful inquiry or correspondence with the medical man making it, the disease generally turned out to have been Consumption. It occurred to me that a fair method of avoiding these discrepancies, and arriving at more accurate results, was to add a line to the Table, combining the total Consumption mortality with that of the diseases of the Respiratory Organs (p. 35), as when thus taken together any error of special diagnosis would be of no importance. On referring to this line it will be seen that the disparity of the former one in a great measure disappears. If we exclude the Gotha, where it is still high, the five British Societies show very harmonious results—the London Equitable and Widows' Fund being lower than the others, very much in the proportion that might be expected from their being older Institutions.

A most important point for Assurance Companies would be to ascertain the age, at which the hereditary or constitutional tendencies to Consumption become so worn out, or weakened, that they might with tolerable safety be ignored in the selection of lives. There can be no doubt that, as a general rule, hereditary Consumption lays hold of its victims at an earlier period of life, than when the disease is acquired or induced by accidental causes. Statistics have shown very conclusively that three-fourths of all the deaths from Consumption, in the general community, take place under 45 years of age. This was exactly the proportion between 15 and 45, on an average of the seven years 1848–54; and it was quite the same on the combined mortalities from this disease in the Widows' Fund and Standard under 50, and the Scottish Amicable under 45, embracing 376 deaths. But we find a great disparity when we examine the decades separately, as will be seen from the following Table, showing the per-centage of the deaths from Consumption at different decades of age:—

Ages, ...	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75
England,.....	29·14	27·97	19·85	12·56	7·39	3·09
Scottish Amicable,	4·67	30·84	36·45	21·49	4·67	1·87

Ages,.....	Under 30	30 to 40	40 to 50	50 to 60	60 and upwards.
Widows' Fund,.....	13·3	35·0	26·6	18·3	6·6
Standard,.....	15·7	48·3	17·9	13·5	4·5

A fair deduction from this Table, as has already been stated generally, is, that the populations of Life Assurance Institutions are so apportioned as to age, that they have a less proportion of deaths from Consumption at early age—say from 15 to 30—than is experienced in the general population, and a considerably higher proportion above that age; also, that of the deaths from this disease above 45, a larger proportion take place between that age and 60 than among the general population. From my observation on the whole subject, I incline rather strongly to the opinion, that the hereditary or constitutional proclivity is well exhausted by 45—presuming that the individual is then strong and hale; and that a large proportion of the cases which occur after that age are acquired from accidental causes, or supervene on other diseases; and these are cases which Assurance Societies have few means of escaping.

The division of the Table exhibiting the per-centage of deaths from Consumption on the deaths from all causes, shows the remarkable result that fully 40 per cent of the deaths which occur among the population of England, aged from 15 to 35, were due to Consumption. At the same ages in the Gotha (and here the returns are likely to be correct), the proportion was about 27, and in the Scottish Amicable about 30 per cent.

It often occurs that while applicants for Life Assurance are personally quite free from disease, and in no way deteriorated by previous disease, grave doubts arise as to their eligibility on account of hereditary or constitutional predisposition to a parti-

cular disease; and they not unfrequently express surprise that this element should ever be taken into consideration, in determining on their fitness for assurance. The duty of giving a report, supported by well-grounded reasons, and at the same time decided, on such cases, is often both difficult and painful. Under no circumstance is it so frequently necessary to reject proposers, otherwise personally eligible, as from a family proclivity to Consumption. The question, then, of how far such tendency ought to influence our opinion, in reporting on such cases, is of vital importance both to applicants for assurance and Assurance Companies.

That Consumption is capable of being transmitted from parent to offspring, and also that a constitutional tendency to the disease, which cannot be traced to their ancestors, may exist in some families, we presume to be admitted; notwithstanding a contrary opinion being held by some crotchety pathologists. It would be of immense importance to be able to ascertain, with some accuracy, the extent and degree of this power of transmission, and of this constitutional tendency. In searching for information on these points, however, we find the present state of our knowledge so defective, that we are lost in difficulties and apparent contradictions. The offspring of consumptive parents may or may not be attacked by the disease, or the seeds of it may lie dormant in one generation, and become developed in the next. Thus we find phthisical parents having apparently healthy children, and apparently healthy parents having phthisical children. Again, one or more children out of several of the same family are not unfrequently cut off by Consumption, when no cause or circumstance can be traced to make them more liable to this disease than their brothers or sisters, who enjoy good health and attain advanced ages. All medical men of experience must have met with families in which both parents were healthy, and, so far as could be traced, free from consumptive taint, yet their children were exterminated by the disease,

as if certain parental combinations had the effect of producing a specific disease in the offspring. These, and similar well-ascertained and frequently occurring facts, render the just consideration of lives who have lost parents, or brothers, or sisters, from Consumption, perhaps the most embarrassing and delicate task which falls to be performed by the medical adviser to an Assurance Company.

Authors differ very widely as to the proportion of cases which are due to hereditary or constitutional causes. In the Hospital for Consumption, out of 1010 cases, 246—being 24·4 per cent, were born of phthisical parents; had collateral relations been included, the proportion would certainly have been higher. M. Portal says that two-thirds are hereditary; M. Piory one-fourth; Mr Ancell one-third; Ruysch as many as four-fifths. Such various statements only show that the subject has not yet been investigated with sufficient care, to permit any accurate conclusion being arrived at.

In all cases of proclivity to Consumption, the various counterbalancing circumstances must be carefully examined and weighed. The first and most important points to be ascertained, are, whether more than one relative has died of this disease, and the degree of propinquity—the age or ages at which death occurred—the number and ages of the members of the family still alive. An only child, for instance, aged thirty, who lost a parent from Consumption, is certainly not in so advantageous a position for acceptance as another, who, though he has lost a parent, has four or five brothers and sisters (some of them older it may be than himself) in good health. The age, personal health and configuration, habits, residence, occupation, the health and longevity of relatives generally, must all be attentively taken into consideration before deciding on such cases. Dr Begbie and Dr Christison have arrived at the conclusion, that, as a general rule, it is prudent to decline proposals where two members of the family have died of Consumption. Both of

them, however, allow that though this may be a sound general rule, it admits of exceptions, and I do not suppose that any prudently conducted Life Assurance Society has been less rigid.

The question, all-important both to the assuring population and to Assurance Associations—To what extent is Consumption hereditary?—remains unsettled, and before it can be, it must be investigated on a much broader basis than has yet been attempted. The records of assurance offices do not afford the means of examining the point fairly or from correct data, as they do not contain the due proportion of individuals with a consumptive tendency, either numerically or in relation to age. Neither do hospital patients afford a fair representation; they belong too exclusively to the working and lower orders, besides they are rarely well informed as to the diseases of which their relations have died. An accurate record of several thousand cases, taken from all classes of the community, showing what proportion of them have lost relatives from Consumption, at what ages, and within what degrees of propinquity;—and what proportion have not, would be of very great value.

Whatever doubts may exist as to the acceptance or declinature of lives personally eligible, but hereditarily predisposed to Consumption, my experience is unfavourable to applicants, who at any period of their lives have had a decided symptom of disease of the lungs, more particularly spitting of blood, however small the quantity, or however short the duration of the attack. The family history may be unexceptionable, the proposer may at the time be in average health, but explain it as he may, special plead the causes in the most ingenious manner, some organic lesion or the seeds of disease may be there, though even an accomplished stethoscopist cannot detect them. Be not deceived by the specious and plausible opinion, that, had serious disease existed, it would have betrayed itself long ago. It is astonishing for what a length of time the seeds of disease may lie dormant in the lungs.

On a careful scrutiny of the papers of the 773 members who have died since the commencement of our Society, I find that 64 of them had each lost a near relative or relatives from Consumption; when we deduct these 64 from the total mortality, (773), we have 709 whose papers do not show any consumptive tendency. Of these, 94, or 13·25 per cent of the 709 deaths, died of Consumption. Of the 64 whose papers do show a hereditary or constitutional tendency, 13, being 20·31 per cent, died of Consumption. Had the deaths from this disease among the 64 been in the same proportion as among the 709, the number would have been 8·5, which, added to the 94, gives 102·5, or 4·5 fewer deaths from Consumption.

According to the preceding observation of the deaths, 8 per cent of the proposals accepted seem to show a consumptive tendency, and that this is quite in accordance with the general proportion among the whole, is confirmed by the careful examination of 1000 cases, accepted continuously, previous to 23d December, 1861. Of these, 69, or 7 per cent, had lost one member of their immediate family, namely, father, mother, brother, or sister; and 11, or 1 per cent, at least two members of their immediate family, from Consumption. For the small difference of 102·5 instead of 107, being 4 per cent on the deaths from Consumption, or a half per cent on the deaths from all causes, would we be justified in denying the benefits of life assurance to all applicants who had lost one, or even two members of their immediate family, from this disease?—or even would any adequate advantage accrue from exercising more stringency than at present, in reference to such cases? I think not—but still I am decidedly of opinion that no relaxation ought to take place. The fact of 13 per cent from Consumption being the proportion of the 709 deaths which occurred among the members of our Society whose papers did not show a proclivity to the disease, and 20 per cent among the 64 whose papers did, indicates the propriety of the greatest circumspection in dealing

with such proposals. It appears to me that in the present state of our knowledge, no very general or fixed rule can be adopted, but that every case must be examined carefully on its own specialities, and a deliberate and reflective judgment formed thereon.

It has been suggested to me, that persons with a consumptive tendency might be of weaker constitutions, more liable to disease, inferior lives in short, and likely to die prematurely of other diseases than Consumption. From the following abstract, prepared in the office, this does not appear to have been the case:—

The average duration of Assurance of all the lives exposed to risk was	5·49	years
Of the 773 Members who died, ...	7·170	"
666 who died of diseases other than Consumption, ...	7·480	"
64 who had a hereditary tendency to Consumption, ...	7·335	"
94 who died from Consumption, having no hereditary tendency, ...	5·40	"
13 who had a hereditary tendency, and died of the disease, ...	5·25	"
107 who died of Consumption, ...	5·431	"

The following Table, showing the duration of the cases of Consumption as returned in the medical certificates of death, may be interesting to the profession:—

Under 3 Months, ...	4
Above 3 and under 6 Months, ...	16
6 and under 9 "	22
9 and under 12 "	19
12 and under 18 "	19
18 and under 24 "	10
24 and under 36 "	8
Above 36 Months, ...	1
Not Stated, ...	8
Total, ...	107

Four of the "not stated" died abroad or at sea, having gone in search of health.

DISEASES OF BRAIN AND NERVOUS SYSTEM.

CLASS IV. OF GENERAL TABLE, PAGE 16.

AGES.	Number of Deaths from Diseases of Brain, etc.			Per Centage of Deaths from Diseases of Brain, etc.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	1,469	0	0	·042	·000	·000	5·09	0·00	0·00	...	...	...	...
25 " 35	1,709	11	13	·062	·058	·088	5·92	7·33	11·60	...	...	...	...
35 " 45	2,224	51	32	·106	·112	·165	8·20	10·30	15·38	...	...	...	...
45 " 55	2,797	103	26	·184	·254	·209	10·54	15·91	14·60	...	...	...	...
55 " 65	3,978	125	27	·393	·585	·475	13·14	17·40	19·56	...	...	...	...
65 " 75	5,257	85	32	·907	1·471	1·708	14·48	18·80	26·66	...	...	...	...
Total,...	17,434	375	130	·153	·282	·230	9·80	15·20	16·81	22·40	20·16	19·72	20·04

It will at once be observed that the mortality from this group is much higher among the assured, than among the general population, whether estimated on the lives at risk, or on the deaths from all causes. On the first, the Gotha and Scottish Amicable combined give ·266 against ·153; and out of 12,243 deaths from all causes among the assured, 2363 were from diseases of this Class, being 19·29 per cent, while the proportion in the general community was only 9·80, showing, by both methods of computation, that the number of deaths among the assured from Brain and Nervous diseases, was nearly double of what took place among the population of England.

It was satisfactory to find that though a large number of the deaths among the assured from Consumption were premature—took place at comparatively early ages—the mortality was greatly below the proportion which occurs from that disease among the general population. In this Class, we find very much the opposite; for, while the mortality is greatly in

excess of that of the population, it fortunately occurs at the more advanced ages, as will at once be apparent on a glance at the Table, which shows a great increase in the proportion of deaths above 55.

The commonly received opinion that persons of peculiar physical configuration—those with short necks, full and corpulent habit of body, large heads and ruddy countenances—are prone to apoplexy and other head diseases, is, no doubt correct; but the converse by no means holds so true as is generally believed, for we find many individuals are the subjects of these affections of the head, who are free from the above physical characteristics—in fact, the tall, thin, and athletic are, in my observation, about as often attacked as the plethoric. Disease of the Heart and Bloodvessels is undoubtedly a frequent cause of head affections, notwithstanding that a contrary opinion is held by some pathologists, and must never be lost sight of in the examination of applicants for assurance. In the certificates of death it is not unlikely that these two causes may occasionally be transposed.

The great extra mortality which occurs among the assured from diseases of this Class requires some investigation. As far as I can judge, the causes are to be ascribed mainly to moral temperament, occupation, and industrious habits. As a class, the assured are thoughtful, hard-working, business men, anxious for the welfare of their families, and their advancement in life. Their occupations, whether those of literature, politics, the learned professions, or commerce, have required at all times, but more particularly of late years, great mental application, and are attended with much excitement and many vicissitudes. The tendency to transactions of great magnitude, the increase of speculation, the frequency and rapidity of travelling, consequent on the wonderful progress of mechanical inventions, all tend to make men live faster, and call for a greater strain than formerly on the nervous system of that class, whose success in life de-

pends on the exercise of their mental powers. Consequently it is much as might be expected to find, that the mortality from diseases of the Brain and Nervous System is greater among them, than among those who live comparatively at ease, or those who gain their bread by following occupations of a more mechanical character, and where the mental powers are much less called into action.

It may not be out of place here to direct attention to a custom, which the great facilities of modern travel has introduced among men of business, and which I feel satisfied exercises a baneful influence on the brain and nerves. I allude to the practice of living at a distance from the great commercial centres, and daily travelling many miles, morning and evening. The effect on a number of individuals is, that instead of becoming braced in health, robust, and hardened to fatigue and exposure, they get enervated, worn in aspect, complain of want of refreshing sleep, of a feverish heat of body, uneasiness, sometimes amounting to pain in head, and an unfitness for any mental application for an hour or more, after arriving in town in the morning. Nor is it to be wondered at that many so suffer. The phlegmatic and cool-headed may escape, but the fatigue and excitement of the system is more than the nervous organisation of most men is equal to. I cannot do better than quote the graphic description of this method of modern recreation, as given by Dr Forbes Winslow, that great authority on Mental Diseases: "I have, like many others, during the summer season, removed my family for a period to a watering-place some fifty miles from London, and travelled to and fro night and morning by express train. I have been convinced that the advantage of sleeping by the sea-side, and of an occasional day of rest there, was fully counterbalanced by the fatigue, and wear and tear of mind and body, incidental to daily journeys over this considerable distance. I went to bed at night conscious that I must rise at a fixed and somewhat early

hour, or miss my train. I am sure that this does not render sleep more sound and refreshing; and every one sleeps best on the Saturday night, when this disturbing element does not exist—since the next is the day of rest. In the same way, breakfast is eaten with this necessity of being in time still on one's mind. Then, like every one else, I had to get the cab or carriage and go down to the station; to scramble for the morning paper, and get a seat. Then comes the long journey with all its fatiguing accompaniments. Finally, one has to get to one's residence; this process, or something like it, *mutatis mutandis,* being repeated twice a-day. I refer to these separate details, because it is in analysing the general series of phenomena, that I am able to explain the fatiguing effects, mental and physical, of constant railway travelling." *

Besides the above, the calls of nature are apt to be neglected or attended to in a hurried manner, and the great effort of the day is to compress business into a limited and fixed time, which often causes hurry and irritation at the last, and it may be, a fretful feeling of dissatisfaction throughout the evening, on account of some duty which has been omitted or forgotten. There is, perhaps, no town in the kingdom where the custom of travelling long distances, in the morning and afternoon, is so generally adopted as Glasgow. Nor is this in some respects to be wondered at. Nowhere are the facilities for escaping from the smoke, turmoil, and annoyances of a large commercial city, so numerous or so cheap, and certainly nowhere can more tempting localities for recreation and enjoyment be found, than amidst the beautiful and romantic scenery of the Clyde. The consequence is, that during the summer and autumn months, a large number of our citizens are in the habit of travelling from 25 to 50 miles twice a-day, partly by rail and partly by steamboat. From some opportunities of observation, I know that

* Lancet, January 11th, 1862.

many suffer from so doing, and that long daily journeys by rail and steamer, with the numerous causes of bodily and mental excitement which attend such a mode of life, are apt to induce and do induce disorders of the Brain and Nervous System.

Mr Neison, the eminent actuary, has found that among the intemperate, as a class, beyond 20 years of age, 50 per cent die of diseases of the nervous system and of the digestive organs; while, on the general population, the average deaths from these causes only amount to 16 per cent. The proportion of deaths from the diseases of these organs combined, among the members of the Scottish Widows' Fund and the Standard Company being respectively 34 and 30, Mr Neison arrived at the conclusion, that the members of these Societies must have been more intemperate than the general population of England. At this accusation their highly-respected medical advisers are justly indignant, and both of them have published refutations of the reproach on the habits of their countrymen, which so fully expose the fallacy of the deduction, that it is quite unnecessary for me to enter upon it, further than to refer to the above Table, from which it will be seen that the deaths from diseases of the nervous system, among the assured in the London Equitable, from 1801 till 1832, coincide very nearly with those in the Scottish Institutions; and the Table of diseases of the Digestive Organs, at page 59, also proves that the mortalities of all the offices very nearly correspond. When the two classes of diseases are combined, three of the Scottish Offices, whose members are drawn from all parts of the United Kingdom, show a lower mortality than the London Equitable, the members of which Society are almost entirely Englishmen. In fact, as regards temperance, I believe that the habits of the assuring class, are very similar, in all parts of the kingdom.

In the Scottish Amicable Society, *Apoplexy and Paralysis*

furnish 72 out of the 130 deaths in this class. Of these 18 were under 45; 31 between 45 and 65; and 23 above that age; which is much in accordance with the general statistics as to age in these diseases. Paralytic affections, from whatever cause, may be looked upon as among the most natural terminations of life. The occurrence of deaths from them is consequently not to be considered an unfavourable feature in Life Assurance returns; for, though they will always account for a large number of deaths, a great proportion of these will generally occur among the older members.

Thirty-seven deaths are ascribed to *Chronic disease of the Brain;* we have no case referred directly to Insanity, but I doubt not some of these were complicated with mental affections. There is really nothing to be found in the proposal papers of these cases, either as regards personal or family history, which would have led to the expectation that they might die from these diseases.

There were eight victims to *Delirium Tremens,* all of them between the ages 25 and 45. Though none of the papers on which they were accepted indicate a fair suspicion of habits of intemperance; still, from the shortness of the duration of the assurance in some of them, it is difficult to suppose that they were strictly temperate when admitted. It is impossible for the Directors and Officials of any Society to be more careful and searching in their inquiries on this point, than those of the Scottish Amicable. Though eight deaths only are ascribed directly to intemperance, there can be no doubt that the number who were cut off by diseases induced by irregular habits was much greater. In an assurance company transacting an extensive business, premature deaths from this cause cannot be avoided. It may happen that an individual who is intemperate will elude the utmost vigilance, and get his life assured; others acquire the unfortunate habit after being accepted.

The cases marked *Cephalitis* were generally returned as Inflammation of the Brain or of its membranes, and were all of a duration which renders this likely to be correct.

Five deaths from *Epilepsy* are surely a large proportion.

For the reasons already stated, diseases of this Class may be expected to furnish a much greater proportion of the mortality of Assurance Societies than of the general population; and it is not probable that medical science will enable us to do much more, than at present, in detecting those most likely to be attacked by them. Men, in whom no experience could have predicted such an event, often become the subjects of Brain and Nervous diseases, induced more by moral than by physical causes.

DISEASES OF HEART AND BLOODVESSELS.

CLASS V. OF GENERAL TABLE, PAGE 16.

Ages.	Number of Deaths from Diseases of Heart, etc.			Per Centage of Deaths from Diseases of Heart, etc.								
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.					
	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.
15 to 25	849	0	0	·024	·000	·000	2·95	0·00	0·00	...	...	...
25 " 35	1,006	2	5	·036	·010	·034	3·48	1·33	4·46	...	...	...
35 " 45	1,396	13	8	·066	·028	·041	5·15	2·62	3·84	...	...	...
45 " 55	1,866	21	20	·123	·051	·161	7·03	3·24	11·23	...	...	...
55 " 65	2,429	31	17	·240	·145	·299	8·02	4·31	12·31	...	...	...
65 " 75	2,416	2	15	·417	·034	·800	6·65	0·44	12·50	...	...	...
Total...	9,962	69	65	·087	·051	·115	5·60	2·79	8·40	11·00	10·00	9·36
Total, with one-third of Cases of Dropsy added	12,541	146	67	·110	·109	·119	7·05	5·92	8·66	11·27	10·31	10·51

I regret, that from the imperfect nosological arrangement of the Table of the Equitable Society, I have not been able to extract from it the deaths which occurred from diseases of the organs of circulation.

On examining the line marked Total in the foregoing Table, the much greater mortality from diseases of this Class among the members of the British Institutions than among the general population, or the members of the Gotha, at once attracts attention. This is undoubtedly owing to Dropsy being classified in the Registrar-General's Reports, and also by the Gotha Society, as an independent disease, instead of being ascribed to disease of the organs, on which it almost invariably depends. As already explained (page 30), I presume that one-third of the cases of Dropsy are a consequence of disease of the heart, and I have appended a line to the Table showing the result with this proportion added. This, it will be seen, greatly modifies the discrepancy, and I have no doubt is the only correct explanation of it. When looked at in reference to the lives at risk, the just criterion, the approximation is as near as could be expected. In the Gotha, (where even with a third of the cases of Dropsy added, the mortality, when measured by the deaths from all causes, is very low,) and the four Scottish Assurance Offices combined, the deaths from diseases of the Heart and Bloodvessels amounted to 732 out of 8148, being 8·98 against 7·05 in the general population.

An additional proof that I am correct in dealing with Dropsy in the manner I have done, is found in the circumstance of the rate of mortality in this class, being very high in the Scottish Amicable above the age of 45, but more especially above 65. A large proportion of the cases of Dropsy resulting from heart diseases occur in advanced life; and the comparatively low mortality from these affections in England, and the Gotha above 45, shows that cases in which Dropsy was a prominent symptom have been omitted from this Class, and entered elsewhere.

Of the 57 deaths from Disease of Heart and Pericardium, in our Society, 14, being 25 per cent, had suffered from

Rheumatism in some form before acceptance. The very frequent occurrence of Inflammation of the Heart, or its investing membranes, in connection with Rheumatism, is a subject of vital importance to Assurance Societies. The connection between them is so intimate, that, in an inquiry such as the present, they cannot be separated, Rheumatism being by far the most frequent cause of Disease of the Heart. The relative proportion of cases in which this complication exists, is variously stated by different authors. Dr Fuller, in his elaborate analysis,* found that in 246 cases of acute Rheumatism, 145, or 1 in every 1·69; in 133 cases of sub-acute, 42, or 1 in every 3·11; and in 379 cases of both these forms of Rheumatism, 187, or 1 in every 2·02, were either preceded, or accompanied, by some affection of the Heart. Mr Bury,† in an account of 476 cases of acute Rheumatism, treated in the wards of the Middlesex Hospital, found that more than one-half, or about 53·7 per cent, suffered from recent heart complications. In a Table of 588 cases of acute Rheumatism, taken from the writings of Dr Budd, M. Bouillaud, Dr Latham, Dr Taylor, and treated by the Physicians of St George's Hospital, 306, being 1 in every 1·91, had recent heart affections.‡ From the above I think it may fairly be considered as established, that the heart is affected in at least one-half of the cases of acute and sub-acute Rheumatism.

Rheumatic inflammation of the heart, as a general rule, leaves some organic lesion. The exceptions to this in my experience are rare. It may for long not excite any very perceptible influence on the functions of the organ, or on the health and comfort of the person affected, and it may elude careful physical examination, or be attended with only a slight endocardial murmur, but it is liable to increase insidiously, or rapidly

* On Rheumatism, Rheumatic Gout, and Sciatica, 3d Edition, p. 263.
† Med. Chir. Review, July, 1861. ‡ Fuller, ut supra, p. 264.

to become aggravated from many causes, both bodily and mental.

Acute Rheumatism and its cardiac complications are essentially diseases of early and middle life—a most important consideration in the business of Life Assurance. This is fully illustrated by the following Table, compiled from Dr Fuller's work, p. 281:—

Ages.	Number of Cases of Rheumatism.	Number of Cases with Heart Complications.	Per Centage of Heart Complications on Total Cases.
Under 25	196	110	56·12
25 to 35	119	55	46·22
35 " 45	43	17	39·53
45 " 55	17	4	23·53
55 upwards	4	1	25·00
Total,...	379	187	49·34

From the above, it is evident that a large proportion of cases of Disease of the Heart, the result of Rheumatism, occur at an age previous to that at which most lives are assured; showing the necessity for a careful general and physical examination, into the condition of this organ, in all cases where the applicant has suffered from this affection, either in an acute or sub-acute form. Rheumatic Fever may take place at a very early age, as early as the fourth or fifth year, and then lay the seeds of irremediable Disease of the Heart. I have known two such cases, where the circumstance was forgotten, and only recalled to mind by the parents many years afterwards, when serious Disease of the Heart had become evident.

Violent muscular exertion, I am satisfied, is a frequent ex-

citing cause of Heart Disease, particularly among the young. The great excitement and straining exertion inseparable from the training necessary for the boat races, cricket matches, and racket playing of the present day, have laid the foundation of Disease of the Heart in many a fine athletic youth, shortened his days, and rendered them, from impaired health, full of suffering and disquietude.

As a general rule, it may be stated that a large proportion of the deaths from Disease of the Heart which occur prematurely, or under 50 years of age, have their origin in Rheumatic inflammation of the organ, or are the result of over-exertion at athletic games.

Diseases of the Heart, like Diseases of the Brain, are a common result of the wear and tear of life, and Assurance Societies must expect a large rate of mortality from them, among their older members; but among the younger, surely some diminution in the number of premature deaths may be obtained, by a careful stethoscopic examination of this organ and of the vascular system. The exercise of the greatest caution and the most minute investigation, not only of the physical signs, but also of the general state of the circulation, are perfectly indispensable, when the applicant has suffered from Rheumatism, chiefly in an acute form, or has engaged too much in athletic sports, or any pursuit requiring great muscular exertion.

We had eight deaths from *Aneurism*, being 1 in 8 of all our deaths in this Class—surely a large proportion. They were all either of the thoracic or abdominal aorta.

DISEASES OF THE RESPIRATORY ORGANS.

CLASS VI. OF GENERAL TABLE, PAGE 16.

Ages.	Number of Deaths from Diseases of the Respiratory Organs			Per Centage of Deaths from Diseases of the Respiratory Organs.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848–54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	1,329	2	0	·038	·162	·000	4·60	50·00	0·00	...	...	...	...
25 " 35	1,688	13	11	·061	·069	·074	5·84	8·66	9·82	...	...	...	...
35 " 45	2,379	55	14	·113	·121	·072	8·78	11·11	6·73	...	...	...	...
45 " 55	3,507	61	19	·230	·150	·153	13·21	9·42	10·67	...	...	...	...
55 " 65	5,167	66	17	·511	·309	·299	17·06	9·19	12·31	...	...	...	...
65 " 75	6,054	54	17	1·045	·934	·907	16·68	11·89	14·16	...	...	...	...
Total...	20,124	251	78	·178	·188	·138	11·31	10·17	10·09	12·87	12·17	12·89	12·45

It must be borne in mind that Consumption is not included in this Class.

When the mortality from this group of diseases is measured by the lives at risk, it will be observed that the result is slightly in favour of the Gotha and Scottish Amicable combined; the shortcoming is very marked in the Scottish Amicable. When measured by the deaths from all causes, we find the Gotha, and Scottish Amicable to be rather under, and the other four offices to be rather above the general population. The deaths among the members of the six Assurance Associations from the diseases of this Class, were 1460 out of 12,243, being 11·92 per cent, or nearly the same as in the general population of England. I may again direct attention to the circumstance referred to at p. 37, viz., that Bronchitis scarcely enters into the calculations of the Gotha Society, and not at all into those of the London Equitable; from which, for reasons formerly given,

I inferred that the deaths from that disease had been recorded as Consumption by both of these Societies. If I am correct in this, it must materially influence the value of any deductions which may be drawn from their reports, both in regard to Phthisis, and to the diseases of the Respiratory Organs, when taken separately; but I have so far obviated this error by adding a line to the Consumption Table (p. 35), in which the results from that disease are combined with all the others of this Class.

The most prominent diseases of this Class in the Scottish Amicable were *Pneumonia and Bronchitis*, which were just equally fatal. As might have been expected, the members who fell from Pneumonia did so at much earlier ages than those who died from Bronchitis—15, or a half of the former, having died under 45, while only 6, or 1 in 5 of the Bronchitic were under that age. The other diseases of this group furnish 15 deaths—a number probably under what might have been expected, considering the population of the Society.

In examining an applicant for Assurance, who admits having suffered from an inflammatory attack in the respiratory organs, the greatest care ought to be taken to discover, by the physical and general signs, whether it has left any appreciable lesion, and if so, how far such is likely to affect the general health, or render the individual more liable to disease in future.

As a general rule, the more acute diseases of the lungs attack the healthy and robust, or those among them who are accidentally exposed to cold, wet, fatigue, vicissitudes of temperature, and similar exciting causes. Premature deaths from them may therefore be considered as properly incident to Assurance Societies,—to meet such being one of the grand objects of their institution. No diminution, I think, can be expected in the average mortality from this Class.

DISEASES OF THE DIGESTIVE ORGANS.

CLASS VII. OF GENERAL TABLE, PAGE 17.

Ages.	Number of Deaths from Diseases of Digestive Organs.			Per Centage of Deaths from Diseases of Digestive Organs.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848-54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	1,268	0	1	·037	·000	·042	4·39	0·00	5·88	...	...	...	...
25 " 35	1,537	4	9	·056	·021	·061	5·33	2·66	8·03	...	...	...	...
35 " 45	1,958	39	21	·093	·086	·108	7·22	7·87	10·09	...	...	...	...
45 " 55	2,539	46	23	·167	·113	·185	9·57	7·10	12·92	...	...	...	...
55 " 65	3,077	78	25	·304	·365	·440	10·16	10·86	18·11	...	...	...	...
65 " 75	2,657	40	16	·458	·692	·854	7·32	8·84	13·33	...	...	...	...
Total...	13,036	207	95	·114	·155	·168	7·32	8·39	12·29	12·39	10·77	10·36	9·93
Total, with one-third of Cases of Dropsy added	15,615	284	97	·137	·213	·172	8·77	11·51	12·54	12·65	11·08	11·51	12·04

When estimated by the lives at risk, the Table shows a considerable excess of mortality from this Class in the Gotha and Scottish Amicable, over that of the general population; and when estimated by the deaths from all causes, the whole Assurance Societies show an excess, the Gotha and London Equitable the smallest. This is to a great extent accounted for by Dropsy being entered by the Registrar-General in Class II., and by the two Societies last named as a distinct disease, while by the Scottish Offices, as formerly explained, it is correctly referred to the diseases of the organs on which it depended. I have added a line to the Table, embracing a third of the cases of Dropsy, from which it will be observed that the results in the Assurance Societies are generally more in accordance with each other, and, I feel satisfied, much more correct. Still, the mortality among the assured from diseases of the Digestive Organs is considerably

in excess of that of the general population. Excluding Dropsy, 1144 out of 12,243, being 9·34 per cent, died of these diseases, against 7·32 in the population of England. Including a third of the cases of Dropsy, the deaths numbered 1374 out of 12,243, being 11·22 against 8·77.

The Liver is the abdominal organ on diseases of which Dropsy almost entirely depends, and the following Table shows, in the first line, the result according to the number of deaths reported from disease of that viscus alone, by the Registrar-General and the Assurance Offices; the second line shows the result with a third of the cases of Dropsy, recorded by each, added:—

	Number of Deaths from Diseases of Liver.			Per Centage of Deaths from Diseases of Liver.								
				On Lives at Risk.			On Deaths from all Causes.					
	Eng-land.	Gotha.	Scot. Amic.	Eng-land.	Gotha.	Scot. Amic.	Eng-land.	Gotha.	Scot. Amic.	Wid. Fund.	Stan-dard.	North Brit.	Lond. Equit.
Total, ..	3380	48	49	·029	·036	·087	1·90	1·94	6·33	4·24	6·15	4·22	4·27
With one-third cases of Dropsy added,	5959	125	51	·052	·094	·091	3·35	5·06	6·58	4·50	6·46	7·34	5·36

The disparity, it will be observed, though considerable by both methods, is much less so in the second than in the first line, and shows an equalisation among the Assurance Societies more in accordance with what might have been anticipated. The deaths from disease of the Liver, with Dropsy added, measured on the lives at risk, were nearly double among the assured of what they were in the general population; and among the assured who died, they were 704 out of 12,243, or 5·66 against 3·35 in England.

From the above, the important deduction follows, that the assured, as a class, are more prone to diseases of the digestive organs, especially the Liver, than the general population. It appears to me that this must mainly be ascribed to their mode of living, and their sedentary and luxurious habits. As before stated, the great proportion of them are in a position to com-

mand the comforts and luxuries of life. Do they indulge in these too freely? Do they lead too inactive lives? That they do, cannot be an unfair inference from the above statistics of this group of diseases.

There has, admittedly, been a great improvement within the last 30 or 40 years in what are termed "the drinking habits" of the upper and middle classes of society; but in other respects they certainly live more luxuriously, and indulge more in what are commonly termed the pleasures of the table. The present style of living, with its varieties of food and wine, its rich cooking, luxuries, condiments, protracted mode of serving, and late hours, appears as if designed to tempt into excess, and to strain the digestive organs beyond their natural power or functions. It is rarely necessary to tell any one "to live well" who has the leisure and the means of doing so—most persons so circumstanced "live too well." Professional and commercial men who, for a great portion of their time, lead more sedentary than active lives, are in the present routine of social life much exposed, and often addicted to excesses and imprudencies in diet. They are more likely to suffer from the consequences than those, who may indulge as freely, but whose time and occupations being much at their own disposal, lead more active out-door lives. Still, even they do so irregularly, and often pass a large portion of their time, particularly as they advance in life, in inactivity and luxurious ease. To these classes the assured chiefly belong; and the proportion of diseases of the Stomach, Liver, and Digestive Organs, is greater among them, than among the industrious and labouring portion of the community, whose occupations, as a general rule, promote digestion and health, and who cannot afford to hurt their constitutions by the undue gratification of their appetites. The latter, taken as a class, are considered to be the healthiest portion of the community, and if it be admitted that they are more addicted to excess in the use of intoxicating liquors, than

the middle and upper ranks, the mortality among them from diseases, particularly diseases of Liver—usually considered to result from habits of intemperate drinking—is lower, than among the more sober part of the population, which would lead to the conclusion that excess in eating, and the sedentary habits with which it is usually attended, is more hurtful to the health than excess in drinking.

Under the terms *Gastritis and Enteritis* are comprehended the more acute inflammatory affections of the Stomach and Bowels—from these we had 12 deaths, which do not call for any particular remark. In most instances such cases arise from exciting causes, unconnected with any previous disease or constitutional tendency, so that we have no information to guide us in selecting or rejecting them.

Diseases of the *Stomach and Bowels*, of course include a considerable number of the affections of these organs. In the papers of applicants, it is by no means uncommon to find that they have suffered from, or still occasionally suffer from, "indigestion" or "bilious attacks," and on applying to their medical attendant for information, such attacks are generally reported as trivial, or the result of some error of diet, and consequently much importance is not attached to them. But when they are frequent, when the proposer admits that he is obliged to be careful in his diet, that he is subject to heartburn, flatulence, irregular bowels, and other symptoms of indigestion, when his expression of countenance is somewhat anxious, when he is thin, particularly in the face and hands, it is necessary to be exceedingly guarded. These applicants tell you they have had such symptoms for years; that they have only to be cautious as to what they eat; that they have long ago found out what suits them, and that, on the whole, they are better of late years; which may all be very true, still they are far from being

average lives. In such cases, the food does not undergo the necessary chemical and vital changes, to afford the required nutrition to the body, the functions of assimilation and secretion are weak and imperfectly performed, so that the dyspeptic often becomes the subject of gouty and cutaneous affections, of chronic rheumatism, or of some disease of the lungs, liver, digestive or urinary organs—in short, of a general morbid diathesis, ending in fatal disease, before the tabular expectation for his age is run. Consequently, in the examination of applicants for assurance, it is of the utmost importance to recognise and duly estimate the effects of the disorders of the digestive organs.

Seven deaths have occurred from *Jaundice* or *Biliary Obstructions.* In none of the papers of these assurers is any mention made of an attack of Jaundice previous to application; but had it been otherwise, it really is a question how far it would have influenced the acceptance or rejection of the proposal. In our present state of knowledge, or rather, of ignorance, as to the pathological condition or conditions on which Jaundice depends, we would not be justified in refusing an applicant under middle life, though he had suffered a considerable time before from an ordinary attack of Jaundice of no long duration, and unaccompanied by any complication or broken health. It is different, however, with individuals who have had Jaundice in middle or advanced life; with them it rarely depends on functional derangement alone, is difficult of cure, apt to recur, and to lead to broken health and organic disease.

Diseases of the *Liver* form a large proportion of this Class in the Scottish Amicable—as many as 49 out of 95. The returns indicate that they were almost entirely of the chronic, or non-inflammatory character, which appears to be quite as common in temperate climates as the more acute or inflammatory affections of this organ are in tropical. By the papers of the mem-

bers who died from diseases of the Liver, I find that nine had suffered from Dyspepsia or Bilious attacks, and one from Gout before acceptance.

The first stage of many of the forms of disease to which this important organ is liable, is rarely marked by any very well-defined or positive symptom. Extensive disease often exists before it is seriously suspected, or medical aid sought. In examining all applicants for assurance, particularly those who have reached middle-life, the state of the functions of the Liver ought to be carefully inquired into. If the habits of the proposer have been at all those of the *bon vivant*, the Hepatic region must be carefully explored, and if any fulness is found there, or obtuse pain on pressure, or if inability to lie for any length of time on the left side is admitted, with occasional bilious indigestion; nausea, cough, and frothy expectoration, on getting up in the morning, I would consider him inadmissible. This morning cough and sickness, when persistent, I have found to be one of the most frequent symptoms of incipient disease of the Liver.

We had two deaths from *Hernia*, both of them after the operation for strangulation. Neither of them suffered from this affection when accepted. The Society has not for many years charged any extra premium for Hernia, if the subject of it wore constantly a properly fitting truss, and was impressed with the necessity of doing so. The result bears out the safety of this liberal practice.

DISEASES OF THE URINARY ORGANS.

CLASS VIII. OF GENERAL TABLE, PAGE 17.

AGES.	Number of Deaths from Urinary Diseases.			Per Centage of Deaths from Urinary Diseases.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848-54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	214	0	0	·006	·000	·000	0·74	0·00	0·00	...	...	...	...
25 " 35	334	0	2	·012	·000	·013	1·15	0·00	1·73	...	...	...	...
35 " 45	399	7	4	·019	·015	·020	1·47	1·41	1·94	...	...	...	...
45 " 55	451	10	5	·029	·024	·040	1·69	1·54	2·80	...	...	...	...
55 " 65	585	13	7	·057	·060	·123	1·93	1·81	5·07	...	...	...	...
65 " 75	780	10	3	·134	·173	·160	2·14	2·21	2·50	...	...	...	....
Total.....	2,763	40	21	·024	·030	·037	1·55	1·62	2·71	4·55	4·69	3·22	3·61
Total, with one-third of Cases of Dropsy added	5,342	117	23	·047	·088	·040	3·00	4·74	2·97	4·87	4·92	4·37	5·68

In this Class, the disturbing element of Dropsy again obtrudes itself, and deranges the general conclusions. It will be observed, from the line marked Total, that the mortality from this group, on the lives at risk in the Scottish Amicable, is in excess of that experienced in the general population and the Gotha Society. This is quite accounted for by the cases of disease of the Kidney, terminating in Dropsy, not having been entered in this Class by the Registrar-General or Gotha Society, but as "Dropsy," among the diseases of Uncertain Seat, Class II. On adding one-third of the cases of Dropsy to the deaths in the population of England and in each Society respectively (as explained at page 30), a different and certainly more correct result is obtained. When the mortality is then estimated by the deaths from all causes, the results in the general population and in the Scottish Amicable are nearly the same. The other Assurance Societies

exhibit a remarkable equality—the London Equitable being about 1 per cent higher. The deaths among the assured from this Class, including Dropsy, were 600 out of 12,243, being 4·90 per cent, against 3·00 of the population. I am at a loss to render any satisfactory reason for this excess of disease of the Urinary Organs among the assured. The same causes which were considered to operate as exciting disease in the Digestive Organs, may have some influence here, but certainly not to so great an extent.

Gout is essentially a disease of those who can command all the comforts, and who indulge in the luxuries of life. It rarely proves fatal as a distinct disease; and probably there are no forms in which it more frequently expends itself than in diseases of the Prostate Gland, Bladder, or Kidneys, which may, to some extent, account for the excess of diseases of these organs among the assured. Medical science has made great progress, of recent years, in the pathology of diseases of the Kidney, and in the investigation of the derangement of its functions; and several diseases wont to be referred to other organs, particularly convulsive and comatose head affections, will in future, more correctly, be ascribed to the Kidney.

The diseases of this Class from which deaths occurred among the members of the Scottish Amicable, do. not require any special remark; they are very much what might have been expected. The low rate of mortality, I have no doubt, is owing to the large proportion of young and middle-aged lives among the members; as these advance in years, the mortality from this Class will be equalised with that of older Assurance Societies.

As to the detection of these diseases, or what constitutes a tendency to them, among proposers for life assurance, I can offer no suggestion, except rigid inquiry into the habits and family history of the individual. When any suspicion of former or present disease of the Kidney exists, a chemical examination of the urine ought to be made.

Class IX.—DISEASES OF CHILD-BED.

Three deaths resulted from these causes, in addition to four from Puerperal Fever, which are included among Zymotic Diseases, Class I. The sexes not being distinguished in the reports of the other Assurance Offices, I cannot make any comparison, and really the numbers are so limited, that though I could, it would be of little value. With us, they formed ·066 of the female lives at risk, and 4·61 of the female deaths.

To the queries regarding family history in assurance papers, a frequent reply, in reference to mother or sisters, is, "died in child-bed." This is much too vague, and ought not to be accepted as satisfactory without further inquiry, especially if, from age, defective or doubtful information or any other cause, the least hesitation as to the eligibility of the proposer exists. That the progress of Consumption is often arrested by pregnancy is a well-established medical fact; when so, it generally runs a rapid course after parturition, and the cause of death is frequently ascribed to non-recovery from child-bearing; whereas, the patient had been suffering, for long before, from Consumption, and died of that disease. As a general rule, it is necessary to ascertain exactly the particular circumstances connected with deaths, reported in the family history of applicants, to have taken place in, or after child-birth.

Class X.—DISEASES OF JOINTS AND BONES.

In this Class a very large proportion of the diseases are of a Scrofulous character; and as these fall chiefly on childhood and early life, and among that portion of the population who are subjected to the privations of poverty, they are little felt by Assurance Associations. When measured by the lives at risk, they were about one-half that of the general population; and by the deaths from all causes among the assured, they were ·64 against 1·28 in the general community.

Three of the seven deaths from this Class in our Society were ascribed to diseases of the Spine, the members were aged 44, 50, and 58 respectively, and had all been assured for upwards of eight years. In the two cases reported as disease of Bones, the seat of the disease is not stated; but one of them, in his proposal papers, admits having had disease of the bones of foot in youth. He was 45 years of age.

The two members reported to have died of *Rheumatism* were females. The one, aged 46, of Rheumatic Fever of a month's duration; the other, aged 50, had been ill of Rheumatism for three months. I have little doubt they both fell victims to heart complications.

Class XI.—DISEASES OF THE INTEGUMENTARY TISSUES.

Only 16 deaths are ascribed to these diseases out of 7666 which occurred among the assured, being ·21 per cent, while the proportion among the general population was ·35.

From this Class the Scottish Amicable had four deaths, three of them from Carbuncle—all men under 40.

Class XII., *Malformations*, and XIII., *Premature Births*, of the Registrar-General's classification, do not enter into the mortality list of Assurance Societies.

Class XIV.—ATROPHY.

To this affection 10 deaths are attributed in the Widows' Fund, 8 in the North British, and 43 in the London Equitable, being 61 in all, or ·79 per cent of their united mortality. The disease does not appear in the nomenclature of the other Assurance Offices.

Class XV.—GRADUAL DECAY AND SENILE DEBILITY.

Number of Deaths from Gradual Decay, etc.			Per Centage of Deaths from Gradual Decay, etc.									
			On Lives at Risk.			On Deaths from all Causes.						
England.	Gotha.	Scot. Amic.	England.	Gotha.	Scot. Amic.	England.	Gotha.	Scot. Amic.	Wid. Fund.	Standard.	North Brit.	Lond. Equit.
3324	82	16	·029	·061	·028	1·87	3·32	2·06	2·42	3·23	3·76	13·82

From the above, it appears that the deaths in the general population and in the Scottish Amicable, on the lives at risk in this Class, were in the same proportion—in the Gotha they were greatly higher. Among the assured (excluding the London Equitable, for reasons to be afterwards given) the deaths were 245 out of 8148, or 3·00 per cent against 1·87 in England; including the London Equitable, the rate was 6·63 against 1·87. When estimated by the second division of the Table, the results, in all the Assurance Societies except the Equitable, bear a fair equality to each other. The large proportion of deaths from this Class in the London Equitable is, at first sight, rather startling, but on reflection admits of explanation. In the first place, the nomenclature that was adopted by that Society is more general, and altogether more imperfect than that of the others, so that many deaths included by it under "Age," and other vague terms, would, by the more modern institutions, have been attributed to some specific disease. Again, the large rate of mortality from old age and debility, in the London Equitable, is quite what might be looked for, when we consider that the Society had existed for 70 years before the date of the report, so that the members had had time to grow old. It is to be hoped that the younger institutions will be able to show as large a proportion of deaths *at advanced ages*, when they arrive at the same maturity, but classified more in accordance with the improvements of science which have taken place of recent years. The London Equitable had 566 deaths out of

4095 from "Decay, natural and old age;" 556 of these were above 60 years of age, 428 of these above 70, and 187 of these above 80. Of the 16 deaths in this Class which occurred in the Scottish Amicable, 13 were above 70, which I consider to indicate as accurate a return as could reasonably be expected.

Class XVI.—CAUSES OF DEATH NOT ASCERTAINED.

There were 196 deaths in this Class out of 12,243, which occurred among the assured, being 1·60 per cent against 1·15 in England.

It is rather remarkable that the proportion of unascertained diseases should be higher among the assured than among the general population. The attention of the profession, and of the officials of Life Assurance Institutions having of late years been directed to the great importance of accurate returns, I have no doubt in future the number in this Class will greatly diminish.

ACCIDENTAL INJURIES, SUICIDES, Etc.

CLASS XVII. OF GENERAL TABLE, Page 17.

Ages.	Number of Deaths from Accidents, etc.			Per Centage of Deaths from Accidents, etc.									
				On Lives at Risk. A, page 18.			On Deaths from all Causes. B, page 18.						
	England, Average of seven years, 1848-54.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	England.	Gotha Society.	Scottish Amicable.	Scottish Widows' Fund.	Standard.	North British.	London Equitable.
15 to 25	1,797	0	3	·052	·000	·127	6·23	0·00	17·64	...	...	...	...
25 " 35	1,521	9	10	·055	·048	·067	5·27	6·00	8·92	...	...	...	...
35 " 45	1,404	19	14	·067	·042	·072	5·18	3·83	6·73	...	...	...	...
45 " 55	1,283	27	9	·084	·066	·072	4·81	4·17	5·05	...	...	...	...
55 " 65	997	27	5	·098	·126	·088	3·29	3·74	3·62	...	..	...	...
65 " 75	725	5	2	·125	·086	·106	1·99	1·10	1·66	...	...	...	...
Total...	7,727	87	43	·068	·065	·076	4·34	3·12	5·56	2·81	4·92	3·45	1·85

The deaths from the causes embraced in this group are proportionally more numerous in the Scottish Amicable than in the general population, or among the assured. The Standard also shows a high rate. The other offices are under the general community; all combined, they furnish 380 deaths out of 12,243, being 3·10 per cent against 4·34.

I would have expected a greater difference. It would scarcely have been anticipated that the population of Assurance Institutions, where the working classes scarcely enter, would furnish a rate of mortality from violent deaths, within one and a quarter per cent, of that of the great body of the people, who, from their occupations, are constantly exposed to an endless variety of accidents. Can it be that suicide is a more frequent crime among the middle and upper, than among the lower orders?

The low rate of mortality from Accidental Causes in the London Equitable attracts notice. The statement of that Society was published in 1832, before the days of universal travelling, and many other sources of accident which are now common; its members also at that time belonged to a class scarcely exposed to the risks of accidental death—still, the number of deaths by railway, steamboat, and other methods of modern locomotion, as given by the different Assurance Institutions, by no means accounts for the greater proportion of violent deaths which have occurred among the assured of late years, in comparison with the number reported by the London Equitable.

A more minute analysis of the deaths in the Scottish Amicable from the causes proper to this Class gives the following details:—Two were killed by railway accidents; one by the bursting of a steam-carriage on a common road; sixteen by falls from heights, horses, carriages, etc.; three from gun-shot wounds—one of them a military man who fell in battle; three died from poison; the large number of ten were drowned, of whom only two were mariners by profession; one gentleman was assassinated in South America; and seven committed suicide.

In two of the cases of poisoning, and one of the deaths from gun-shot wounds, grave doubts existed as to whether they should be ascribed to accident or suicide. The circumstances of these were so remarkable, as to be worth narrating:—A gentleman of middle age, in excellent health, insured his life for large sums, for a limited period, in several offices. The assurances, several of them at all events, were effected in February. He continued in perfect health, and followed his usual occupation, up to the day preceding his death, which took place in April. His family, with the exception of one boy, were from home. He dined at a public dining-room, returned to his own house in the evening, sat some time and played a game of chess with his son, said he did not feel well, retired early, and desired his servant to bring a wine-glass to his room, as he wished to take some medicine. She found him in bed; he desired her to give him the contents of a phial which was on the toilet-table; she saw no phial there, and told him so, when he immediately said—"you will find it somewhere about." She then drew his attention to a phial on the mantelpiece, and he immediately said—"Oh, yes, that will be it," or words to that effect. The servant accordingly poured the contents of this phial into the glass, and gave it to him; he swallowed the liquid, said it was very nasty, took a bit of orange, lay down, and was left for the night. Next morning he was found completely narcotised, and died in a few hours. On investigation, it was discovered that he had got *laudanum;* but a bottle containing *black draught,* was found on the table, under the looking-glass. If this was a case of suicide, it even surpasses, in the cunning of its device, that of Gammon, so graphically depicted in "Ten Thousand a Year." It was found after his death that he had been unable to meet his pecuniary obligations.

The other case of poisoning occurred with a gentleman who had been assured about three years, but for some time previous to his death his health was impaired. He had been in the habit

of taking laudanum to assuage pain and procure sleep, and one night he took a fatal over-dose, whether by accident or design was extremely doubtful. It was calculated that he lived for fifty-six hours after swallowing the poison.

The gentleman who died from a gun-shot wound had insured his life for large sums, for the period of five years, in the month of November. While grouse-shooting in the August following, he sent his only attendant, on rather a frivolous message, to a cottage about a quarter of a mile distant; the messenger, on returning, found him lying at the side of a hedge, shot through the head, and quite dead.

TABLE showing the Average Duration of Assurance, the Per Centage of Deaths on the Lives at Risk, and on the Deaths from all Causes in the Scottish Amicable Society, in relation to each Class of Diseases.

Diseases.	Number of Deaths.	Average Duration of Assurance.	Per Centage of Deaths on Lives at Risk.	Per Centage on Deaths from all Causes.
		Years.		
Class I.—Zymotic,	150	5·713	·2664	19·4049
" II.—Diseases of Uncertain Seat,	30	7·222	·0533	3·8808
" III.—Consumption,	107	5·331	·1900	13·8421
" IV.—Diseases of Brain and Nerves,	130	8·538	·2309	16·8175
" V.—Diseases of Heart, etc.,	67	9·053	·1192	8·6674
" VI.—Diseases of Respiratory Organs,	78	8·089	·1386	10·0918
" VII.—Diseases of Digestive Organs,	97	7·542	·1724	12·5485
" VIII.—Diseases of Urinary Organs,	23	8·690	·0409	2·9752
" IX.—Childbed Diseases,	3	3·166	·0053	·3880
" X.—Diseases of Joints and Bones,	7	6·642	·0125	·9055
" XI.—Diseases of Integumentary Tissues,	4	5·722	·0071	·5174
" XII., XIII., XIV.—No Deaths,	...	...	...	.....
" XV.—Gradual Decay,	16	13·750	·0284	2·0698
" XVI.—Causes of Death unascertained,	18	5·611	·0319	2·3285
" XVII.—Accidents,	43	5·290	·0763	5·5626
Total,	773	7·170	1·3732	100·0000

TABLE exhibiting the relation between the OCCUPATIONS and the DISEASES which were most fatal in the SCOTTISH AMICABLE SOCIETY.

OCCUPATIONS.	Cholera and Diarrhœa.	Fever.	Tropical Fever.	Erysipelas.	Cancer.	Consumption.	Delirium Tremens.	Diseases of Brain and Nervous System.	Diseases of Heart and Blood-Vessels.	Diseases of Respiratory Organs.	Diseases of Digestive Organs.	Diseases of Urinary Organs.	Gradual Decay.	Suicides.	Accidents.	Miscellaneous Diseases.	Causes of Death not ascertained.	TOTAL.
Advocates, Solicitors, & Accountants,	3	4	...	...	...	5	...	13	4	3	8	2	...	1	1	4	1	49
Agents, Salesmen, etc.,	...	1	...	...	...	2	...	6	2	...	1	...	...	...	...	1	1	14
Agriculturists,	3	3	1	...	...	1	1	8	3	6	5	...	...	...	2	4	1	38
Artists,	...	1	...	...	...	2	...	1	...	1	...	2	...	...	...	...	...	7
Bakers,	1	...	...	...	...	2	...	1	1	2	1	...	...	...	...	...	...	8
Bankers,	...	1	...	...	...	...	...	1	1	2	2	...	1	...	...	...	...	8
Butchers,	...	...	...	...	...	3	...	...	1	2	1	...	...	...	1	...	...	8
Clergymen,	...	2	2	...	..	1	...	4	4	4	5	1	...	...	2	1	1	27
Clerks, ...	2	2	...	1	1	15	...	4	6	3	7	1	...	...	5	3	...	50
Civil Engineer,	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1
Contractors,	3	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	5
Government and Salaried Officials, ..	2	1	...	...	1	5	1	6	4	5	3	...	2	1	...	2	1	34
Hotel Keepers and Spirit Merchants,	...	4	...	...	1	8	2	8	2	1	3	...	...	...	...	1	...	30
Manufacturers,	3	3	...	...	1	5	1	10	3	7	4	1	1	2	3	5	1	50
Mariners,	1	...	...	...	...	...	...	1	...	...	...	...	...	...	2	1	...	5
Mechanics—In-door,	3	4	...	1	...	9	...	4	4	8	4	2	1	1	4	3	1	49
" —Out-door,	...	5	1	1	1	3	...	2	1	2	2	...	...	...	2	1	...	21
Merchants,	8	14	2	1	5	11	2	18	9	10	21	4	2	...	5	5	3	120
Military Officers,	1	1	...	...	...	...	...	1	1	1	...	...	1	...	4	1	1	12
Naval Officers,	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	2
Noblemen and Gentlemen,	2	2	...	...	...	2	1	9	8	4	5	2	5	1	2	3	2	48
Physicians and Surgeons,	2	5	2	...	...	3	...	4	...	4	2	3	...	...	1	1	2	29
Professors and Literary Men,	...	1	...	...	..	...	...	2	...	...	1	...	...	...	...	...	...	4
Students,	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Shopkeepers, ..	2	15	...	2	1	16	...	7	5	3	6	1	1	1	2	2	...	64
Teachers,	...	1	...	...	...	2	...	1	1	...	1	1	...	...	...	1	...	8
Warehousemen,	...	2	...	...	...	2	...	3	1	3	...	...	...	...	...	...	...	11
Not stated,	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	1	3
Females,	5	3	...	2	3	10	...	5	4	7	11	1	2	...	...	10	2	65
TOTAL,	41	79	8	9	14	107	8	122	65	78	95	21	16	7	36	49	18	773

The foregoing Table is by no means devoid of interest, still, not much of an instructive or practical character can be drawn from it. In the following outline, the Occupations are placed in the order according to which the greatest proportionate mortality occurred from the diseases specified:—

Fever proved most fatal to Students, Shopkeepers, Out-door Mechanics, Physicians and Surgeons, Hotel Keepers and Spirit Merchants, and Merchants, in the order in which they are placed.

Consumption—To Clerks, Hotel Keepers and Spirit Merchants; Bakers, Shopkeepers, and In-door Mechanics.

Diseases of Brain, etc.—To Agents, Advocates, Hotel Keepers and Spirit Merchants, Agriculturists, and Merchants.

Diseases of Heart, etc.—To Noblemen and Gentlemen, Clergymen, and Agents.

Diseases of Respiratory Organs—To Bakers, Bankers, Butchers, In-door Mechanics, and Clergymen.

Diseases of Digestive Organs—To Merchants, Clergymen, Advocates, and Clerks.

Gradual Decay—To Noblemen and Gentlemen, and Salaried Officials.

Accidents—To Mariners, Military Officers, Clerks, Agents, and Mechanics.

The deaths from the other Diseases were about equally diffused among the various Professions and Occupations.

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