On the causes of death in the Scottish Widows' Fund Life Assurance Society from 1st January 1853 to 1st January 1860 / by James Begbie.

ON THE CAUSES OF DEATH

IN

THE SCOTTISH WIDOWS' FUND

LIFE ASSURANCE SOCIETY

FROM JANUARY 1853 TO JANUARY 1860.

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EDINBURGH: PRINTED BY THOMAS CONSTABLE,

PRINTER TO THE QUEEN, AND TO THE UNIVERSITY.

1860.

"'Tis the only discipline we are born for:
All studies else are but as circular lines;
And Death the centre where they all must meet."

MASSINGER.

I OFFER no apology for appearing once more, at the end of seven years, with an account of the Deaths that have occurred during the interval among the assured of the Scottish Widows' Fund Society. The investigation, which by its constitution takes place septennially, into the affairs of the Society, affords a suitable opportunity of exercising a scrutiny into the risks emerged by reason of death that have occurred during the period; and the favourable manner in which two former contributions to this branch of medical knowledge have been received, both by the profession and by those engaged in more purely statistical pursuits, encourages me to hope that the present, as furnishing the results of greater numbers and larger experience, will not prove unacceptable.

It is still matter of regret that, among the numerous Institutions for the Assurance of Life, the Standard Company alone has followed the example of the Scottish Widows' Fund Society in the publication periodically of its records of mortality. The reports furnished by Dr. Christison, and the value attached to them, ought to have stimulated others to follow in the same path before this time. These reports confirm and establish the principles and the lessons which are deducible from the published experience of the Scottish Widows' Society. If in any respect they are found to differ, I believe the discrepancy will be ascertained to arise mainly from the greater age, and nearer approach to maturity, which the Society has now attained, and by which a fair average number of risks of all ages has at length been reached.

The septennial period recently completed has added 975 to the list of Emerged Risks on the books of the Society, and raised the

deaths from 1332, the number declared at the former investigation, to 2307,—the gross mortality from the commencement of the Institution in 1815 to the close of the year 1859, a period of forty-five years.

These 975 deaths have occurred among 8957 persons exposed to the risk of mortality.[1]

It becomes my duty to lay before you on this occasion some account of these 975 deaths; and, in doing so, I shall arrange my observations in the same order, and with a view to similar objects as were presented to you in two former reports.

The following Table shows the number of deaths from the different causes, according to the arrangement of the Registrar-General, and the difference in each class between the present and former investigation :—

	PERIOD.		PERIOD.	
	1846-52.	1853-9.	1846-52.	1853-9.
I. *Epidemic & Contagious Diseases.*				
1. Small-Pox,	0	4		
2. Scarlatina,	1	5		
3. Diarrhœa,	3	7		
4. Dysentery,	16	10		
5. Cholera (Malignant),	27	17		
6. Influenza,	8	6		
7. Fever (Remittent),	2	0		
8. Fever (Continued),	63	48		
9. Erysipelas,	10	9		
10. Hydrophobia,	0	1		
			130	107
II. *Diseases of Uncertain Seat.*				
1. Inflammation,	0	2		
2. Hæmorrhage,	1	0		
3. Dropsy,	4	4		
4. Abscess,	0	3		
5. Mortification,	4	6		
6. Scrofula,	0	1		
7. Cancer,	5	28		
8. Tumour,	7	3		
9. Gout,	1	4		
10. Atrophy,	4	3		
11. Debility,	7	0		
12. Sudden Death,	7	5		
			40	59
Carry forward,	...	...	170	166

[1] The average age of these persons at 31st December 1859 was 51 years, being an increase of 2½ years on the age as at the period ending 31st December 1852.

	PERIOD.		PERIOD.	
	1846-52.	1853-9.	1846-52.	1853-9.
Brought forward,.....	...	...	170	166
III. *Diseases of the Brain and Nerves.*				
1. Cephalitis, ...	6	9		
2. Apoplexy, ...	54	67		
3. Paralysis, ...	28	79		
4. Tetanus,.....	1	1		
5. Epilepsy, ...	4	2		
6. Insanity,.....	0	3		
7. Delirium Tremens, ...	7	7		
8. Disease of Brain, ...	50	66		
			150	234
IV. *Diseases of the Respiratory Organs.*				
1. Laryngitis,.....	1	4		
2. Bronchitis,.....	36	44		
3. Pleurisy,.....	7	7		
4. Pneumonia, ...	15	42		
5. Hydrothorax,.....	7	7		
6. Asthma, ...	0	1		
7. Consumption,.....	42	66		
8. Disease of Lungs, ...	21	25		
			129	196
V. *Diseases of Heart & Blood-vessels.*				
1. Aneurism, ...	11	11		
2. Pericarditis, ...	0	2		
3. Disease of Heart, ...	55	122		
			66	135
VI. *Diseases of the Digestive Organs.*				
1. Enteritis, ...	6	9		
2. Peritonitis,.....	2	8		
3. Ulceration of Bowels, ...	3	3		
4. Hernia, ...	2	0		
5. Ileus, ...	4	5		
6. Hæmatemesis, ...	1	7		
7. Disease of Stomach & Bowels,	34	31		
8. Hepatitis, ...	5	2		
9. Jaundice, ...	3	1		
10. Disease of Liver, ...	34	49		
			94	115
VII. *Diseases of the Urinary Organs.*				
1. Ischuria,.....	1	2		
2. Diabetes, ...	1	4		
3. Cystitis, ...	7	2		
4. Stone, ...	1	0		
5. Disease of Kidney, ...	15	39		
6. Disease of Bladder, ...	5	5		
			30	52
VIII. *Childbed, and Disease of Uterus.*				
1. Childbirth, ...	2	1		
2. Ovarian Disease, ...	0	1		
3. Disease of Uterus,.....	3	0		
			5	2
Carry forward,.....	...	...	644	900

	PERIOD.		PERIOD.	
	1846-52.	1853-9.	1846-52.	1853-9.
Brought forward, ...	...	...	644	900
IX. *Diseases of Joints.*				
1. Rheumatism, ...	3	7		
2. Disease of Joints, ...	1	5		
3. Disease of Spine, ...	0	2		
			4	14
X. *Diseases of Integumentary System.*				
1. Carbuncle.	2	0		
			2	0
XI. *Violent Death.*				
1. Suicide, ...	6	6		
2. Drowning, ...	6	4		
3. Accidental Injury, ...	6	19		
			18	29
XII. *Natural Decay and Old Age.*	21	29		
			21	29
Causes not specified or ascertainable,	1	3		
			1	3
Total, ...	...	...	690	975

The deaths from all causes combined, during the last seven years, have thus greatly exceeded those of the previous seven years of the Society's experience; but proportionally in a smaller ratio than might have been expected from the constant increase of membership, and the mature age the Society has now attained.

I. In regard to the class of Epidemic and Contagious diseases, it will be remarked, that, in point of numbers, there has been a considerable diminution in almost all the causes of death which constitute the class—namely, from 130 in the former investigation, to 107 in the present; that is, from $18\frac{3}{4}$ per cent. to 11 per cent. of the total mortality. Small-pox, Diarrhœa, and Scarlatina, form, however, exceptions,—the former, for the first time since the institution of the Society, taking its place on our mortality tables, and numbering four victims; the latter accounting for five deaths in our present scrutiny, in place of one in the former; while Diarrhœa rises from three in the former to seven in the last investigation.

The last three years have proved a season of high mortality from Small-pox; and this experience has naturally led to the enforcement of the provisions for vaccination under existing Acts of Parliament. It becomes the duty of all medical men connected with Life Associa-

tions to ascertain that all applicants for assurance have enjoyed the means of protection or immunity afforded by Jenner's discovery, from one of the greatest scourges to which mankind is exposed. Our records show that four men in the prime of life, each pursuing a healthy occupation in different parts of the country, have fallen victims to its severity during the last septennium. The case of one deserves the additional note, that he effected his assurance in the month of November, and died in the following month, after an illness of fourteen days.

The diminution of mortality in the class of Epidemic and Contagious diseases is chiefly owing to the cessation of Malignant Cholera as an epidemic, and the restricted prevalence of continued Fever. Cholera has, however, been the cause of 13 deaths during the year 1854, and of four more during the last five years, 1855-59; that is, $1\frac{3}{4}$ per cent. of the total mortality. It was in the West of Scotland that the chief mortality during the summer and autumn of 1854 occurred. Four deaths took place in Glasgow, one in Greenock, one in Millport, one in Ayr, and one in Girvan. No death occurred in Edinburgh, and only one in Leith. Two deaths took place in England, and two in Ireland. The remaining four are reported from the colonies, or as having happened at sea. It is remarkable that, of the seventeen who fell victims to the disease, seven were engaged as merchants; the remaining deaths being diffused throughout eight professions or occupations; while two were furnished by females. One death only occurred before 40 years of age, six between 40 and 50, seven between 50 and 60, two between 60 and 70, and one between 70 and 80. One member had survived the date of his insurance 30 years; another, 22; another, 19; another, 18; two others, 15; another, 14; and another, 10. Six had lived from 2 to 10 years after effecting insurance; and three became claims within a few months after the date of their policies. The average expectation, according to the Carlisle Tables, of these seventeen was 27·05 years; their average endurance was only 10·46.[1] Eight of the seventeen fell

[1] I have much pleasure in acknowledging the able assistance I have received on this, as well as on former occasions, from Mr. James Wilson, lately of this Society, now Secretary at Glasgow, to the English and Scottish Law Life Assurance Association, and particularly for the calculations furnished as to expectation and survivancy.

under the terrible disease within 24 hours of seizure; five more in the course of a week. Information on this point in regard to the remainder is wanting, from the circumstance of death happening abroad, or during a long sea voyage.

Fever, one of the most serious sources of loss in the business of life assurance, exhibits a greatly diminished rate of mortality as compared with the former septennial investigation,—namely, 48, in place of 63, deaths; that is, 5 per cent., instead of 9 per cent., of the total mortality among the assured.

In two former reports I entered fully into such statistical data as the records of the Society afford in regard to age, profession, residence, etc., as influencing the mortality of Fever. At present I shall only state, that, of the 48 deaths, five took place between 20 and 30, thirteen between 30 and 40, four only between 40 and 50, fourteen between 50 and 60, eleven between 60 and 70, and one between 70 and 80. Comparatively few risks emerged during the earlier years of insurance. One survived the date of his policy 30 years; two survived that period 28 years; two, 26 years; one, 23; one, 22; three, 21; and two, 20 years each. Eleven risks emerged between the 20th and the 10th years of insurance; eleven more between the 10th and 5th years; and fifteen between the 5th and 1st year of entrance. The average expectation of these forty-eight insurers was 29·55 years; their average endurance was 11·82.

The professions or occupations most liable to risk from Fever cannot be inferred from the data before us; but we notice that the deaths extend over 28 trades or professions: 20 furnish one each; bankers, merchants, schoolmasters, and advocates, furnish two each; writing clerks, writers, military officers, and medical men, three each; while the clergy furnish four, and the female sex five, to complete the list.

It is remarkable that the deaths from Fever are distributed in single cases over eight towns in Scotland, five in England, and three in Ireland; and in single cases also, in four districts in Scotland, in three of our colonies, in three foreign countries, or at sea; that Glasgow, Northampton, Belfast, and Cork furnish two each; while London furnishes three, and Edinburgh so high a rate as nine deaths.

Protection from Fever, to a great extent at least, is believed to be derived from a previous attack of the disease. Our records show, that in three instances, in the present investigation, death occurred

where the parties had been so protected. In only one instance could hereditary predisposition to fever be inferred. It occurred in the case of a medical man, whose father had been cut off at the same period of life, during an epidemic.

The deaths from Erysipelas have been considerably reduced in proportion to the general mortality, and the loss to the Society comparatively small, in consequence of the emerged risks under this head being chiefly in the case of men who had attained advanced ages, and several of whom had exceeded their expectation of life. Thus, of the nine deaths, only one occurred before 40; one between 40 and 50; two between 50 and 60; one between 60 and 70; three between 70 and 80, two of them verging on the octogenarian period; and one between that and 90. One survived his acceptance 2 years; one, 7 years; another, 14 years; and three others, 19 years each. One survived the period 23 years; one, 27 years; and one the long term of 41 years.

II. In the class of Diseases of Uncertain Seat, there is a slight increase,—the number of deaths from these causes being 59 on this occasion, and 40 at the former septennial period, that is, from 5¾ to 6 per cent. of the total mortality. This increase arises mainly from one source, namely, Cancer, under which there are 28 deaths against 5 in our former table. It is gratifying to find that, in consequence of the greater attention to accuracy in the returns, Debility has no place in our present investigation, and that Dropsy only figures as the cause of 4 deaths. The causes which have led to the large addition to the mortality from Cancer, no doubt originate in the same improvement in the certificates of death; but they can be traced also to the circumstance that the advanced age of the Society has brought forward an increasing number of risks to the age at which malignant disease more commonly develops itself. Of the 28 victims of Cancer who have fallen during the present investigation, ten effected assurance before 40 years of age; nine between 40 and 50; seven between 50 and 60; one between 60 and 70; and one after 70 years of age. Of these, one only died before 40; four between 40 and 50; five between 50 and 60; fifteen between 60 and 70; two between 70 and 80; and one—she who assured at 71—fell at the ripe age of 85. The average expectation of these parties was 25·14; their average endurance was 15·41 years. These emerged risks embrace nineteen

males and nine females, and are distributed over sixteen professions or occupations, two of them only having a double number. In seven females the disease affected the breast; in one, its seat was in the liver; and in another, in the rectum. In one male it manifested itself in the breast; in three, in the abdomen; in three, in the gullet; in three, in the rectum; in two, in the tongue; in two, in the stomach; in two, in the groin; in one, in the kidney; and in one, in the lungs. In one only its seat has not been ascertained.

There cannot be a doubt that, under the name of disease of the stomach and bowels, and of the liver, lungs, and other internal organs, many certificates of death have been returned, for which Cancer or other malignant disease could more appropriately have been substituted as the fatal cause.

Under the name of Inflammation two deaths are returned. One occurred in a gentleman aged 66, who was predisposed to Gout; the other in a gentleman of 42, also predisposed to Gout. In both the leg was the part affected. In the latter, Pyæmia was the immediate cause of death. The cases of Mortification occurred in persons advanced in life. The disease, in five cases out of six, affected the foot and leg in the form of senile Gangrene. Gout has been immediately fatal in four instances,—affecting the heart, and subsequently the brain, and terminating in Coma. The parties, in three of these Gout risks, were known to inherit the predisposition to their fatal disease. Three of the parties returned as the subjects of sudden death were found dead in bed, one after severe vomiting. Another died while bathing. Of the fifth no information is afforded, save that he was found dead, having suffered severely from Rheumatism previous to assurance, and that his father had Gout.

III. In the class of Diseases of the Brain and Nervous System, there is a considerable increase of deaths. In the former investigation this class of diseases accounted for 150 deaths, or $21\frac{3}{4}$ per cent. of the total mortality; in the present it accounts for 234, or 24 per cent. of that mortality. The increase arises from one disease alone, namely, Paralysis, which has risen in fatality from 28, or 4 per cent., to 79, or 8 per cent. of the total deaths among the assured. Apoplexy, which yielded 8 per cent. on the former, is reduced to $6\frac{3}{4}$ per cent. in the present scrutiny; and chronic Diseases of the Brain,

which were fatal in the proportion of $7\frac{1}{4}$, occasion only $6\frac{3}{4}$ per cent. of the mortality of the last seven years. Though the diseases of this class bear a higher percentage of death than any other, it is satisfactory to find that the claims on the Society have not arisen from recent insurances, that a large proportion of the policy-holders had outlived their expectation term, and that the average survivancy is much beyond what might have been anticipated. Thus, of sixty-six emerged risks, under Disease of the Brain, each survived, on an average, more than a half of his expectation of life,—that is, 15·08 years on an average, in place of 28·16. Of sixty-seven persons who died of Apoplexy, the survivancy was still higher, that is 15·54 years in place of 24·92; and of seventy-nine victims of Palsy, each survived more than two-thirds of his expectation term, that is, 17·46 years on an average, instead of 23·77.

Dr. Christison records the experience of the Standard Company in reference to the survivancy of the emerged risks under this class of diseases—that is, Apoplexy, Palsy, and chronic Disease of the Brain, as considerably short of these calculations. Thus, of sixty-five cases composing the class, each survived nearly one-half the natural term, that is 11·6 years on an average, instead of 22·5. In future reports there is reason to expect, from advancing years, a nearer approach to the experience of the Scottish Widows' Fund.

Of the sixty-seven deaths from Apoplexy, one occurred before 30 years of age; four between 30 and 40; nine between 40 and 50; twenty-one between 50 and 60; seventeen between 60 and 70; twelve between 70 and 80; and three beyond 80 years of age. Eight only of the sixty-six had effected insurance after attaining 60. Of the seventy-nine deaths from Palsy, one occurred before 30; two between 30 and 40; seven between 40 and 50; nineteen between 50 and 60; twenty-four between 60 and 70; twenty-four between 70 and 80; and two about 80 years of age.

Of these 146 victims of Apoplexy and Palsy there were representatives of forty-seven professions or occupations, the larger proportion furnishing only 1 death each. The learned professions are more largely represented; there being 2 University professors, 2 judges, 2 advocates, 2 schoolmasters, 2 surgeons, 6 writers, and 12 clergymen. The commercial interest is represented by 4 bankers, 5 manu-

facturers, and 14 merchants; the agricultural, by 2 gardeners and 4 farmers; the army, by 2 serjeants, 1 captain of engineers, and 1 colonel; the navy, by 2 mariners and 1 hospital governor; the nobility and landed interest, by 4 noblemen and 8 landed proprietors; while 19 of the emerged risks happened in the case of females.

Of the deaths from chronic Disease of the Brain, one occurred before 30 years of age; nine between 30 and 40; seventeen between 40 and 50; twelve between 50 and 60; sixteen between 60 and 70; ten between 70 and 80; and one above 80 years of age. These sixty-six deaths are diffused throughout 33 occupations or professions; 21 of which furnish only one death each; 4 furnish two each; bankers, solicitors, and private gentlemen, three each; writers, four; medical men and clergymen, five each; and merchants twelve; while two are added by the female sex.

It is satisfactory to find a greatly diminished mortality under the head of Delirium Tremens; but painful to find that of the seven emerged risks the youngest was 32, and the eldest only 56 years of age. The seven occupations followed by these parties were—baker, grocer, brewer, chemist, publican, spirit-dealer, and commercial traveller.

Diseases of the Brain and Nervous System, and of the Digestive Organs, have been considered peculiarly those of the intemperate classes; Mr. Neison, the able actuary, having found that, in a population of intemperate livers beyond 20 years of age, 50 per cent. die of these diseases, while in the general population over England and Wales, the average deaths from these causes, at the same ages, is only 16 per cent. The same writer having, farther, on an analysis of the tables of the Scottish Widows' Fund Society, and of the Standard Company, found that, in the latter the percentage of deaths from these causes is 30, and in the former 34, ventures to suggest, that an inspection of these results immediately throws suspicion on the habits of the lives assured in the Standard Life Office and the Scottish Widows' Fund, but particularly the latter, the observations of which extend over a period of 38 years.[1] I apprehend that, as our observations continue to extend, and our success in the selection of lives progressively increases, these Institutions must retain the suspicious

[1] See Contributions to Vital Statistics, page 221.

character Mr. Neison has somewhat incautiously assigned to them, if that character is made to depend in any measure on the number of their members who die from diseases of the nervous system. For a reference to their mortality tables will show, that the chief sources of death in this class, namely, Apoplexy, Palsy, and chronic Disease of the Brain, are peculiarly the diseases of advanced life,—that they begin to be common at 50, and from that age to the latest term of life they increase in increasing ratio, while the numbers living actually diminish. In this is to be found one explanation of the large percentage of deaths from the causes referred to; and I need scarcely point out another element in the opposite scale, which deranges the calculations in such an examination as Mr. Neison has undertaken,—namely, the fact that Life Associations, of necessity, present a low percentage of death from all the diseases incident to younger ages, partly from the circumstance that comparatively few seek the advantages of assurance before the age of 25 or 30; and chiefly, because the benefits of selection are most conspicuous in the early ages of assurance, when, by careful examination, those predisposed to, or affected with, tubercular disease are excluded from membership. In this way there is a greatly diminished rate of death from consumption alone, our tables giving a percentage of $6\frac{3}{4}$ in place of 20—the rate of death over England and Wales. Such circumstances explain the diminished mortality in the earlier ages, and the great preponderance of deaths from causes which come into operation at the more advanced periods of life. I shall have occasion to return to the subject of intemperate lives. Meantime, I may be allowed to notice, that all the deaths from diseases of the nervous system, during the last seven years of the Society's experience, occurred before sixty years of age, in the case of every disease constituting the class, with the exception of Apoplexy, Palsy, and chronic Disease of the Brain; and that in these affections the fatal event occurred in 103 instances before the age of sixty, and in 109 after that period of life. In marked contrast to this experience, is that of Mr. Neison in regard to his intemperate lives. Of 97, the number who died of head diseases, 57 died of Delirium Tremens; and of the whole 97, only 8 survived the age of sixty.

The following Table exhibits the mortality from Apoplexy, Palsy, and chronic Disease of the Brain, compared with that from all other

causes, at six decennial periods, and the percentage of death at the successive ages :—

Age at Death.	From all Causes.	From Apoplexy, Palsy, and Disease of Brain.	Ratio per cent.
Between 20 and 30,.....	33	3	9·09
,, 30 ,, 40,.....	106	16	15·09
,, 40 ,, 50,.....	167	36	21·55
,, 50 ,, 60,.....	245	52	21·23
,, 60 ,, 70,.....	242	57	23·55
Above 70, ...	182	52	28·57
Total,.....	975	216	22·15

IV. Among the Diseases of the Respiratory Organs, there is, during the last septennial period, a slight increase of mortality. During the former period, 129 deaths, or 18¾ per cent. of the total mortality, were reported under this head, showing a decided decrease as compared with the gross mortality from the commencement of the Society up to that period, which had been found to be so high as 23¾ per cent. On the present occasion, 196 deaths, or 20 per cent. of the total mortality, are returned under this class; and it is satisfactory to find, that Consumption, the most fatal cause among diseases of the respiratory organs, still maintains a greatly diminished rate of mortality. In the first investigation into the causes of death, Consumption accounted for 72 out of 642 deaths, or nearly 11¼ per cent. of the gross mortality; in the last investigation it accounted for 42 out of 690 deaths, or six per cent. of the mortality; and, in the present scrutiny, we find 66 out of 975 deaths, or 6¾ per cent. accounted for from this cause. This is a low percentage compared with the mortality from this cause over England and Wales, which the Registrar-General has shown to be so high as 20 per cent., and small in proportion to the mortality exhibited among other associations, for Dr. Christison, in his last Report on the deaths of the Standard Company, has shown that 60 out of 424 deaths, or upwards of 14 per cent. of the whole mortality, had arisen from Consumption.

The care which has been exercised during a long series of years, in excluding from the benefits of the Society those of early age in whose immediate family the taint of Consumption had manifested itself, has, no doubt, led to these results; but they are also due in

some measure to the mature age of the Institution, which has brought into the field a large and increasing proportion of risks who have passed the period at which the disease is most prevalent.

Of these sixty-six deaths from Consumption, nine occurred between 20 and 30 years of age; sixteen between 30 and 40; twenty-two between 40 and 50; sixteen between 50 and 60; and three only after the sixtieth year. No great improvement can be expected in the average survivancy of our Consumptive risks, except by a rigid attention to family history, and careful examination, especially of the younger applicants for assurance. Of the sixty-six victims of the disease who fell during the present investigation, the average survivancy was only 8·56 years, in place of 31·39 years, according to the Carlisle Tables—a little more than a fourth of their expectation—a proportion considerably higher, however, than that attained by the same class of risks in the Standard Company, Dr. Christison having found that sixty assured persons survived, each on an average, 5·7 instead of 32·6 years, a mere trifle more than a sixth of their natural term of life.

Two of the Consumptive risks of the Society emerged within the first year after acceptance; five during the second year; six during the third year; three during the fourth; seven during the fifth; six during the sixth; four during the seventh; four during the eighth; two during the ninth; and one during the tenth year of insurance. Sixteen deaths occurred between the tenth and fifteenth year after acceptance; eight between the fifteenth and twentieth; and two between the twentieth and thirtieth years.

Of the sixty-six risks, eight were females, and the deaths of the other sex were diffused over thirty professions or occupations; twenty furnish one each; landed proprietors, military men, druggists, clergymen, bankers, innkeepers, grocers, and carpenters, furnish each two; merchants and surgeons, each three; drapers four, and writers and writers' clerks five each.

In two former reports I have entered fully into the subject of the hereditary transmission of Consumption, and its bearing on the business of Life Assurance, with reference to the regulation to which I have alluded for avoiding consumptive risks—namely, that of excluding as ineligible all in whose immediate family more than one instance of the disease has manifested itself. This rule, which has guided the practice of the Society for the last twenty-five years, has been con-

sidered by some as too exclusive, and as tending to circumscribe too much the operations of Life Assurance; but the experience of the Society amply justifies its continued application, with certain exceptions, hitherto acted upon, such as arise from the age, sex, and constitution of the proposer, the number of his family, the proportion of those who have been affected with the disease, and the period he may have survived the age which proved fatal to his relatives. This rule for avoiding consumptive risks—the most serious by far in Life Assurance transactions—has been ably defended by Dr. Christison, in his last Report on the deaths in the Standard Company, and illustrated by his experience of its operation. To these reports I must refer all who take an interest in the subject.

Of the twenty-four Consumptive risks which emerged within five years after acceptance by the Society, sixteen were free from any suspicion of hereditary taint, and were personally unobjectionable at the date of assurance. In regard to the remaining eight, though no personal objection applied, a suspicion attached to six of the number in consequence of one member of their immediate family having died of Consumption; and to the remaining two, in consequence of two or more collateral relatives having suffered from the disease.

Of the nineteen risks which emerged after the parties had attained the age of 50, seven had suspicion attached to them at the time of effecting assurance, from the circumstance of one or more of their immediate family having been carried off by Consumption. The remainder were free of any ascertained taint. Three of the nineteen died at the age of 50; two at the age of 51; three at the age of 52; two at 54; one at 55; two at 56; two at 58; one at 59; one at 63; and two at 67 years of age.

Of ten Consumptive risks accepted after passing the 45th year of age, one died at 50; one at 51; one at 52; one at 56; two at 58; one at 59; one at 63; and two at 67. Four of the ten were known to inherit a predisposition to their fatal disease at the time of acceptance, though personally eligible for assurance; to the remaining six no personal or family objection applied, so far as could be ascertained.

It is somewhat startling, and certainly instructive, to find that out of sixty-six deaths from Consumption, nineteen occurred after the age of 50; and not less so, that of the number, ten took place in parties who had effected assurance after the age of 45.

Of the sixty-six, not one reached his expectation term.

The following table exhibits the mortality from Consumption, compared with that from all other causes, at six decennial periods, and the percentage of death at the successive ages :—

Age at Death.	From all Causes.	From Consumption.	Ratio per cent.
Between 20 and 30,.....	33	9	27·27
,, 30 ,, 40,.....	106	16	15·09
,, 40 ,, 50,.....	167	22	13·17
,, 50 ,, 60,.....	245	16	6·53
,, 60 ,, 70,.....	242	3	1·24
Above 70, ...	182	0	0·00
Total, ...	975	66	6·77

A considerable increase of deaths from diseases of the respiratory organs has been acknowledged during the last septennial period. The source of it has proved unexpected. During the first thirty-eight years of the Society's experience, the deaths from Pneumonia were only 25 in number, or $1\frac{4}{5}$ per cent. of the total mortality; but during the seven years which have just elapsed, the deaths from this cause amount to 42, or $4\frac{1}{3}$ per cent. of the general mortality, and only $\frac{1}{5}$ per cent. short of that of Bronchitis, from which, for many years past, the rate of death has been very high. The deaths from Pneumonia were distributed over all ages, from the earliest period of assurance to the threescore years and ten; fourteen only, however, occurred before the age of 50; and twenty-eight after that period of life, a larger number having died between 60 and 70 than during any other decennial period. The average expectation of the parties was 25·80 years; the average endurance was 12·72 years,—a survivance much beyond that of the consumptive risks.[1] The deaths were distributed over twenty-two professions or occupations. Sixteen furnish one each; agents, writers, and writers' clerks, furnish each two; clergymen, three; gentlemen and landed proprietors, five; merchants, nine; while three were furnished by females.

[1] In the course of the conversation that followed the reading of this Report before the Medico-Chirurgical Society, it was suggested by a speaker, as a means of accounting for the large increase of mortality from Pneumonia, that many cases of

Besides these forty-two deaths from Inflammation of the Lungs, there were seven from Pleurisy—a disease which, in numerous instances, was concurrent with it—and twenty-five from chronic affections of the lungs, not of tubercular origin. Of this class of emerged risks several had exceeded their expectation term. The average survivancy of the class was 13·51 years; the average expectation was 27·44 years. It has been said, in regard to Pleurisy, that physicians know little of the constitutional and other circumstances which predispose to it. To this statement I must take exception. I agree with Hasse, that Rheumatism is unquestionably the most ordinary source of Pleurisy. In a large proportion of cases, Pleurisy will be found to be intimately connected with the rheumatic diathesis; in fact, to appear as a rheumatic affection. In many cases it will be found to be intimately associated with the tubercular constitution, preceding, accompanying, and often terminating tubercular Consumption; and in many cases we recognise it as a concurrent affection with renal disease and other blood-impoverishing disorders. Its ascertained existence, at any former time, in the person of a candidate for Life Assurance, is therefore always to be viewed with suspicion, and careful inquiry instituted in regard to personal and family predisposition. The same remark applies to Pneumonia, a scrutiny of the deaths from these diseases during the last seven years disclosing numerous instances of the intimate connexion existing between Pleurisy and Pneumonia, and the rheumatic and tubercular constitutions. The intimate connexion of Pleurisy with Consumption was long since

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Consumption might have been returned under the former name. The generally acknowledged prevalence of Pneumonia of late years,—the character and reputation of those who are called upon to return the certificates of the causes of death,—and the pains that are known to be taken by the medical officers of Life Assurance Associations, in order to secure, as far as possible, accuracy in these returns, ought to have saved the remark. The age, moreover, at which death occurred in so large a proportion of these cases of Pneumonia—namely, 28 out of 42 after 50 years of age—might have disarmed the suspicion of inaccuracy; and the fact which I now communicate nearly demonstrates its utter groundlessness: I mean, that, of the remaining 14 risks under the age of 50, the termination of the fatal illness was, in one instance, within the first week; in eight instances, within the second week; in one, within the fourth week; and in one, within the sixth week, after seizure; and that, in one of the still remaining three, a *post-mortem* examination revealed the fatal Pleuro-pneumonia; leaving two deaths, certified by intelligent medical men, to the slender suspicion of being "*shifted*" from the column of Consumption to swell the numbers under that of Inflammation of the lungs.

demonstrated by Louis, who informs us, that in 112 cases which he himself examined of persons dead of Consumption, there was but one in which both lungs were free from adhesions.

Bronchitis furnished forty-four deaths to the general mortality, or $4\frac{1}{2}$ per cent. Of these, fourteen only occurred before 60 years of age, and thirty after that period of life. A considerable number of these had passed their expectation term; and the loss to the Society from this cause is comparatively light. The average expectation of this class of emerged risks was 24·76 years; the average survivancy was 19·37 years.

V. Under the head of Diseases of the Heart and Blood-vessels, there has been a large increase of deaths during the last septennial period. In the first report presented to the Society, the deaths were 53 in number, or $8\frac{1}{4}$ per cent. of the total mortality; in the second report they amounted to 66, or $9\frac{1}{2}$ per cent.; but, in the present investigation, they reach the somewhat alarming number of 135,—that is, $13\frac{3}{4}$ per cent. of the total mortality. This at first sight may appear discouraging, but is satisfactorily accounted for. Chronic Disease of the Heart, which accounts for 122 of the 135 deaths, or $12\frac{1}{2}$ per cent. of the general mortality, is, perhaps more than any other, the disease of old age; and hence we find, on a reference to our tables, that of these 122 deaths, twenty-two only occurred before the age of 50, thus leaving 100 to be distributed over the four consecutive decennial periods in the proportions following:—twenty-eight between 50 and 60; forty-one between 60 and 70; twenty-five between 70 and 80; and six beyond 80 years of age. Thus, advancing years and mature age, which have brought this source of mortality to so high a figure, enable the Society to show, in comparison with younger associations, a great improvement in the survivancy of its risks, and a much less serious loss in the business of Life Assurance. In his last report on the deaths in the Standard Company, Dr. Christison, in reference to Diseases of the Heart, mentions that "no improvement has taken place between the one quinquennium and the other in the survivancy of the present risks after their acceptance. Formerly this appeared to be two-fifths of the expectation of life. On the present occasion the average survivancy of each is 9·22 years, the average expectation term 23·5 years; so that the ratio is again nearly two-fifths." And

he adds, "It may almost be assumed, therefore, that the Company has nearly attained the limit of improvement, so far as this cause of mortality is concerned." The experience of every Life Association, however, as it reaches mature age, and obtains an average number of risks at every period of life, will, I apprehend, be much more favourable. As regards this Society, it is satisfactory to find that the average survivancy of each of the 122 emerged risks of this class is 17·93 years, the average expectation being 25·69 years. Thus each attained, on an average, considerably upwards of three-fifths of his expectation term; and there is reason to expect, in future investigations, a still more favourable return. Disease of the Heart, as a class, is one in which much may be done in diminishing loss. Attention to family predisposition, avoiding as far as possible the gouty and rheumatic habits, and careful examination of the chest, will tend to exclude many who might otherwise become claims at an early age on the benefits of Life Assurance. Still, chronic Heart Disease, with its kindred and often associated Apoplexy and Palsy, must prove a fruitful source of death, even under the most rigid system of examination. The great organ of the circulation, and its innumerable vessels, after long years of unceasing action, must become subject to change and decay —to slow, progressive degeneration, which no skill or scrutiny can always detect, and whose existence is only disclosed when the palsied limbs, or oppressed brain, or pulseless heart, have suddenly and unexpectedly declared how irreparable it is.

Of these victims of Heart Disease it was known in regard to fifteen of the number, that, previous to acceptance, they had been affected with Rheumatic Fever, or were hereditarily predisposed to it; and, in regard to ten others, that they had suffered from Rheumatic Gout, or were members of gouty families. Those who are best informed in regard to the intimate relation and frequent association of these blood disorders with Disease of the Heart and its vessels, will be best able to conjecture in how many others, after acceptance, the origin of the fatal malady was laid in the constitutional tendency to Rheumatism and Gout.

The following Table exhibits the mortality from chronic Disease of the Heart, compared with that from all other causes, at six decennial periods, and the percentage of death at the successive ages:—

Age at Death.	From all Causes.	From Heart Disease.	Ratio per Cent.
Between 20 and 30,.....	33	0	0·00
,, 30 ,, 40,.	106	8	7·55
,, 40 ,, 50,... ..	167	14	8·38
,, 50 ,, 60.....	245	28	11·43
,, 60 ,, 70,.....	242	41	16·94
Above 70, ...	182	31	17·03
Total,.....	975	122	12·51

Of the eleven cases of Aneurism, five occupied the aorta, and one the subclavian artery. The seat of the disease in the others is not ascertained. One death occurred before 50; five between 50 and 60; and five between 60 and 70. One of the parties had Rheumatic Fever three years before acceptance, and another acknowledged the death of a brother from Disease of the Heart.

VI. Under Diseases of the Digestive Organs there is a diminished mortality—that is, from 13¾ per cent. during the former period to 11¾ per cent. of the total mortality during the last seven years. Chronic Disease of the Stomach and Bowels, and chronic Disease of the Liver, constitute the chief causes of death under this head; the former, however, in considerably diminished numbers; the latter in nearly the same proportion as in the last investigation—the one yielding 3⅛ per cent., the other 5 per cent. of the general mortality.

The average survivancy of the thirty-one emerged risks from Disease of Stomach and Bowels was 17·52 years, instead of 26·36 years—their average expectation of life. The average survivancy of the forty-nine risks from Disease of the Liver was 13·44 years in place of 27·04 years—their average expectation term. The greatest mortality from Stomach Disease occurred between 60 and 70 years of age—twelve deaths having taken place during that decennium; nine during the previous decennium; three during the period between 30 and 40; three during that between 40 and 50; and four during that between 70 and 80. The largest mortality from Liver Disease occurred between 50 and 60—sixteen out of forty-nine deaths occupying that period—the remainder, in nearly equal proportions, being distributed over the six decennial periods immediately preceding and following.

This is the class which, along with that of diseases of the Urinary Organs, next in order, is the chief source of loss from the prevalence of intemperate habits; for I cannot agree with Mr. Neison in considering diseases of the Nervous System as a class directly connected with habits of this description. No doubt he can point to Delirium Tremens, to softening and effusion, and some other chronic affections of the Brain, as intimately connected with the excessive use of stimulants; and it may, with truth, be said that there is, perhaps, no class of disease which may not be developed and fostered by such vicious indulgence; still, the great amount of mortality from diseases of the nervous system, such as Apoplexy and Palsy, cannot be said to arise directly from intemperance. Were this the case, our Tables would demonstrate these diseases as prevalent at a period of life far earlier than they do; and, instead of their ranking with Heart Disease and other affections of the vascular system, to which they more properly belong, as the diseases of advanced life and old age, we would find the period of their greatest prevalence to correspond more with that of Delirium Tremens, of Liver and Kidney Disease, which is found to be that of manhood and middle age. The drunkard falls before the shock of an accident or operation: he is cut down by every fatal epidemic. The malignant Cholera, the contagious Fever, the Dysentery and Influenza, which may spare the sober and temperate, light on him with unusual severity. He cannot stand an attack of Inflammation of the Lungs or other internal organ; and quickly succumbs under a Hæmorrhage or other exhausting discharge. He does not live half his days. The habits of the intemperate favour the development of Gout and other blood-poisons, engendering diseases both of the vascular and nervous systems, and in this way bear a part in loading the columns of our Mortality Tables; but it is chiefly through the digestive, assimilating, and depurating organs that intemperance directly damages health, shortens life, and occasions loss in the business of Life Assurance. It would be unfair, however, to conclude that an increase of deaths from these causes is to be regarded as proof of the increase of intemperance in the community. Many of the affections of the stomach, and liver, and kidney, which terminate fatally, have no connexion with such a cause; all we can admit is, that many of the most rapidly fatal are unhappily so connected. In the experience of this Society, during the last seven years, there has been a considerable

decrease in the mortality from Delirium Tremens, as well as from diseases of the digestive organs. This, I trust, will be regarded as an indication of improved habits as regards temperance among its members, even though the fact of an increased mortality from nervous diseases may weigh against it, seeing that that mortality chiefly arises from diseases to which *old age* itself gives the most powerful predisposition.

Of the thirty-one emerged risks from Stomach and Bowel Disease, it was known, in regard to six of the number previous to acceptance, that they had suffered from Dyspepsia; of two, that they had been subject to Gout; and of one that he had been affected with Jaundice. In six of the number, Scirrhus and Cancer of the Stomach was the fatal termination; in three, Ulceration of the Bowels; in three, Diarrhœa; in two, Perforation; and in one, Stricture. Wasting, Hæmorrhage, and other symptoms of organic disease were present in many others. In no case was intemperance in the proposer ascertained to exist previous to acceptance.

Of the forty-nine emerged Liver risks, it was known in regard to four, previous to acceptance, that they were bilious; to three others, that they were dyspeptic; to three, that they had suffered from Rheumatic Fever; and to others, that they had been subject to piles. In one there were suspicions of his continued sobriety; and two were the offspring of intemperate parents. Two had long been resident in tropical climates. The professions or occupations of the forty-nine emerged risks were thirty in number. Nineteen represented one each; drapers, agents, farmers, landed proprietors, bankers, clergymen, and physicians, two each; millers, three; writers, four; and merchants, five each. The four remaining risks were females. In two of the forty-nine, Hæmatemesis preceded the fatal issue. In seven, Jaundice; and in eleven, Dropsy was a prominent symptom. In three only was there a record of *post-mortem* examination.

VII. Of Deaths from Diseases of the Urinary Organs, there is a slight increase. This class on the last occasion accounted for thirty deaths, or $4\frac{1}{3}$ per cent. of the whole; on the present they number fifty-two, or $5\frac{1}{3}$ per cent. of the mortality. The increase arises entirely from one cause, namely, Disease of the Kidney, which rises from fifteen to thirty-nine,—that is, from $2\frac{1}{6}$ per cent. to 4 per cent. of the

total mortality. The united endurance of these thirty-nine emerged risks was 614·44 instead of 1068·49 years; that is, each survived acceptance on an average 15·76 years in place of 27·40. Seven died between 30 and 40; three between 40 and 50; twelve between 50 and 60; twelve between 60 and 70; three between 70 and 80; and two between 80 and 90 years of age. The deaths were diffused over twenty-four professions or occupations, seventeen contributing one each; land-agents, commercial agents, writers' clerks, landowners, and noblemen, two each; while writers and merchants gave five each; and two belonged to the female sex. Of two of the number it was known before acceptance, that they were free livers; of two, that they were subject to sore-throat; of three that they were dyspeptic; and of three, that they were gouty. The fatal event was preceded in two instances by Hæmaturia; in three by Palsy; in three by Heart Disease; in six by Coma; and in ten by Dropsy. In four cases the true cause of death was ascertained by *post-mortem* examination. Thus, by greater accuracy in the returns of the causes of death, Dropsy has nearly disappeared from our Nosological Table, and no doubt will shortly be extinguished, and give place to Cardiac, Hepatic, and Renal Disease as the true cause of death. In like manner, the term Serous Apoplexy will, by and by, fall into disuse, when the Coma, and Palsy, and other cerebral affections, which have been considered as indicative of such a condition, shall be referred to the true primary disease, and a more correct nomenclature adopted.

VIII. The deaths in Childbed and Diseases of the Uterus are only two in number. In the one case Abortion, in the other Ovarian Dropsy was the fatal cause,—in the former at 28, in the latter at 66 years of age.

IX. In the ninth class, that of Diseases of the Joints, there is an increase of deaths: fourteen emerged risks, against four in the former investigation. Rheumatism, acute in six and chronic in one case, was the cause of half the mortality. Disease of the joints in five, and of the spine in two, accounts for the remainder. In two of the rheumatic cases a predisposition to the disease was ascertained before acceptance. Rheumatism and Gout seldom appear in Mortality Tables as the immediate cause of death; still they are two of the most influential agents

in shortening the duration of life, chiefly through the effects they produce directly or indirectly on the heart and vascular system. To this subject attention has been directed in former reports.

X. Diseases of the Integumentary System. In last investigation, two cases of Carbuncle supplied the only entry under this head; in the present, there is no death to report.

XI. Under the name of Violent Death there are twenty-nine emerged risks, or 3 per cent. of the total mortality. Through suicide, or drowning, or accidental injury, these twenty-nine, whose united expectation on acceptance was 885·89 years, survived only 267·09 years; that is, each on an average lived 9·21 years, in place of 30·55 years, their average expectation term.

The accidents of travelling account for ten deaths: six persons were killed by being thrown from gigs; one by fall from an omnibus; one by being thrown from his horse; one perished in the wreck of a steamer; and one by the upsetting of a boat. Two persons were drowned while bathing; two were killed by falling from a height; one was accidentally shot, and another accidentally shot himself; one was murdered by poachers; and one perished in the ruins of the great fire at Newcastle. One was killed by the bursting of a steam-engine; one was mortally wounded by steam-engine machinery; one was crushed to death at a railway station; and another by accidental injury not explained. One was murdered by a knife-wound in the neck; two perished by self-inflicted gunshot wounds; two by hanging, and two by drowning themselves. These distressing casualties, numerous as they are, bear a considerably smaller proportion to the general mortality than is exhibited in the experience of similar institutions.

XII. Lastly, as some compensation for the loss inflicted by these early deaths, we record an equal number of emerged risks under the head of Old Age and Natural Decay,—of twenty-nine whose conjunct expectation on acceptance was 538·84 years, but who outlived that term till their united survivancy amounted to 708·85 years,—each on an average thus attaining 24·44 years in place of 18·58 years, their average expectation of life. Of these old age risks, two emerged before the 70th year; sixteen between 70th and 80th years; and

eleven after the 80th year; the oldest of the brotherhood, and an early member of the Society, at the age of 94. Of these twenty-nine, twenty-three were males and six females; of the twenty-three, five were merchants, four belonged to public offices, three were clergymen, two were private gentlemen, and two were farmers. One nobleman, one landed proprietor, one physician, one sugar-refiner, one watchmaker, one clothier, and one printer, completed the list.

Of the 975 risks which have emerged since our former investigation, 182 had passed the age of 70, and of these, thirty-two had passed the age of 80. It is creditable to those on whom devolves the duty of framing the certificates of death, that so few as twenty-nine should be returned under the head of Old Age and Natural Decay. Greater accuracy, however, it is hoped, will yet be attained; and greater value consequently, attached to these records of death among the assured, when the special disease shall have been recognised, even at the latest term of life, and Natural Decay shall have yielded up its percentage of mortality, to be distributed over our Tables among the *diseases* incident to Old Age.

TABLE I.

Showing the Diseases of which Persons Assured by the Scottish Widows' Fund Society have died, from 1853 *to* 1859 *inclusive; and the Age, by Decennial Periods, at which Death occurred.*

CAUSES OF DEATH.	AGE AT DEATH.							Total.
	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
CLASS I.								
Small-pox,	1	1	1	1	...	...	...	4
Scarlatina,	1	...	4	...	...	...	...	5
Diarrhœa,	1	...	1	2	1	2	...	7
Dysentery,	...	...	...	2	5	3	...	10
Cholera,	1	...	6	7	2	1	...	17
Influenza,	...	1	...	1	2	2	...	6
Fever (Continued),	5	13	4	14	11	1	..	48
Erysipelas,	1	...	1	2	1	3	1	9
Hydrophobia,	...	...	...	1	...	...	...	1
CLASS II.								
Inflammation,	..	...	1	...	1	...	...	2
Dropsy,	...	1	...	2	...	1	...	4
Abscess,	...	1	1	1	..	...	...	3
Mortification,	...	...	...	1	4	1	...	6
Scrofula,	...	...	1	...	...	...	...	1
Cancer,	...	1	4	5	15	2	1	28
Tumour,	...	...	...	2	1	...	...	3
Gout,	...	...	...	2	2	...	...	4
Atrophy,	1	1	...	...	...	1	...	3
Sudden Death,	...	1	...	2	1	1	...	5
CLASS III.								
Cephalitis,	...	1	4	4	...	...	...	9
Apoplexy,	1	4	9	21	17	12	3	67
Paralysis,	1	2	7	19	24	24	2	79
Tetanus,	...	...	...	1	...	...	...	1
Epilepsy,	...	...	...	2	...	...	...	2
Insanity,	...	1	...	2	...	...	...	3
Delirium Tremens,	...	3	3	1	...	...	...	7
Disease of the Brain,	1	9	17	12	16	10	1	66
CLASS IV.								
Laryngitis,	...	2	...	...	2	...	...	4
Bronchitis,	...	2	3	9	18	9	3	44
Pleurisy,	...	2	1	2	2	...	...	7
Pneumonia,	1	4	9	10	12	5	1	42
Hydrothorax,	...	...	3	1	2	1	...	7
Asthma,	...	...	...	...	1	...	...	1
Consumption,	9	16	22	16	3	...	..	66
Disease of the Lungs,	...	3	9	6	4	3	...	25
Carry forward,	24	69	111	151	147	82	12	596

Table I.—Continued.

CAUSES OF DEATH.	AGE AT DEATH.							Total.
	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
Brought forward, ...	24	69	111	151	147	82	12	596
CLASS V.								
Pericarditis, ...	...	...	...	1	1	...	...	2
Aneurism, ...	...	...	1	5	5	...	...	11
Disease of the Heart, ...	...	8	14	28	41	25	6	122
CLASS VI.								
Gastritis Enteritis, ...	...	3	1	3	1	1	...	9
Peritonitis, ...	3	...	3	2	...	...	...	8
Ulceration of Bowels, ...	...	...	2	...	...	1	...	3
Ileus, ...	...	1	...	1	1	2	...	5
Hæmatemesis, ...	...	...	1	1	4	1	...	7
Disease of Stomach and Bowels, ...	...	3	3	9	12	4	...	31
Hepatitis, ...	...	1	1	...	...	...	...	2
Jaundice, ...	...	...	...	...	1	...	...	1
Disease of the Liver, ...	1	4	13	16	7	7	1	49
CLASS VII.								
Ischuria, ...	...	...	...	1	...	1	...	2
Diabetes, ...	...	1	1	1	1	...	...	4
Cystitis, ...	...	...	...	...	1	1	...	2
Disease of Kidney, ...	...	7	3	12	12	3	2	39
Disease of Bladder, ...	...	...	...	...	2	3	...	5
CLASS VIII.								
Childbirth, ...	1	...	...	...	...	...	...	1
Ovarian Dropsy, ...	...	...	...	...	1	...	...	1
CLASS IX.								
Rheumatism, ...	...	...	4	2	1	...	...	7
Disease of Joints, ...	...	1	2	...	...	2	. .	5
Disease of Spine, ...	1	...	...	...	...	1	...	2
CLASS X.								
No Deaths.								
CLASS XI.								
Violent Death, ...	3	8	6	11	1	...	...	29
CLASS XII.								
Old Age, ...	...	...	...	...	2	16	11	29
Causes not ascertained, ...	...	...	1	1	1	...	...	3
	33	106	167	245	242	150	32	975

TABLE II.

Showing the Diseases of which Persons Assured by the Scottish Widows' Fund Society have died, from 1815 *to* 1859 *inclusive; and the Age, by Decennial Periods, at which Death occurred.*

CAUSES OF DEATH.	AGE AT DEATH.							Total.
	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
CLASS I.								
Small-pox,	1	1	1	1	...	...	...	4
Scarlatina,	1	4	4	1	...	...	...	10
Diarrhœa,	1	1	1	4	4	3	...	14
Dysentery,	3	1	4	5	12	5	1	31
Cholera,	4	4	13	19	8	1	...	49
Influenza,	...	1	4	3	9	7	1	25
Ague,	...	...	1	...	...	...	...	1
Fever (Remittent),	1	1	...	...	1	...	...	3
Fever (Continued),	8	36	42	49	27	3	...	165
Erysipelas,	2	3	5	6	4	5	2	27
Hydrophobia,	...	...	...	1	...	...	...	1
CLASS II.								
Hæmorrhage,	1	...	2	1	1	1	...	6
Inflammation,	...	...	1	...	1	...	...	2
Dropsy,	...	2	4	6	3	2	...	17
Abscess,	...	1	2	1	...	1	...	5
Mortification,	1	...	...	5	9	2	..	17
Scrofula,	...	...	1	...	...	...	...	1
Cancer,	1	1	6	9	19	2	1	39
Tumour,	...	2	1	6	3	3	...	15
Gout,	...	..	...	3	3	1	...	7
Atrophy,	2	3	1	1	1	1	1	10
Debility,	...	1	2	2	9	3	...	17
Sudden Death,	...	4	3	3	2	3	...	15
CLASS III.								
Cephalitis,	2	6	16	11	6	...	...	41
Apoplexy,	3	10	31	46	54	23	5	172
Paralysis,	1	5	11	28	37	40	6	128
Convulsions,	...	...	1	1	...	...	...	2
Tetanus,	...	...	1	2	...	...	...	3
Epilepsy,	...	...	3	3	. .	1	...	7
Insanity,	...	3	2	3	...	...	...	8
Delirium Tremens,	1	6	10	2	1	...	...	20
Disease of Brain,	4	20	35	29	32	14	2	136
CLASS IV.								
Laryngitis,	...	4	4	1	3	...	...	12
Bronchitis,	2	8	9	20	31	20	8	98
Pleurisy,	1	3	4	2	5	...	...	15
Pneumonia,	1	5	16	19	15	10	1	67
Carry forward,	41	136	241	293	300	151	28	1190

Table II.—Continued.

CAUSES OF DEATH.	AGE AT DEATH.							Total.
	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Above 80.	
Brought forward,	41	136	241	293	300	151	28	1190
Hydrothorax,	...	1	9	9	8	4	2	33
Asthma,	...	...	...	2	2	1	...	5
Consumption,	24	63	48	33	11	1	...	180
Disease of Lungs,	1	10	17	15	13	8	3	67
CLASS V.								
Pericarditis,	...	2	2	1	1	...	...	6
Aneurism	...	1	7	8	8	...	1	25
Disease of Heart,	1	17	30	63	72	33	7	223
CLASS VI.								
Gastritis Enteritis,	2	5	5	6	3	1	...	22
Peritonitis,	5	1	4	3	...	...	...	13
Ulceration of Bowels,	...	3	4	1	4	2	...	14
Hernia,	...	1	1	...	1	...	...	3
Ileus,	...	1	3	4	3	3	...	14
Hæmatemesis,	...	1	2	2	4	1	...	10
Disease of Stomach and Bowels,	4	11	11	30	26	13	...	95
Hepatitis,	...	1	3	5	2	1	...	12
Jaundice,	...	1	1	1	4	...	...	7
Disease of Liver,	1	7	25	34	14	14	1	96
CLASS VII.								
Ischuria,	...	...	...	2	...	2	...	4
Diabetes,	...	2	2	2	2	...	...	8
Cystitis,	...	...	...	1	3	6	1	11
Stone,	...	...	...	...	1	1	...	2
Disease of Kidney,	...	10	7	24	16	3	2	62
Disease of Bladder,	...	...	...	1	5	11	1	18
CLASS VIII.								
Childbirth,	1	3	2	...	...	...	...	6
Ovarian Dropsy,	...	...	...	...	1	...	...	1
Disease of Uterus,	...	...	4	...	1	...	...	5
CLASS IX.								
Rheumatism,	...	1	5	3	3	...	...	12
Disease of Joints,	...	2	2	...	1	2	...	7
Disease of Spine,	1	...	...	...	...	1	...	2
CLASS X.								
Carbuncle,	...	...	...	1	...	1	...	2
CLASS XI.								
Violent Death,	4	18	18	21	3	1	...	65
CLASS XII.								
Old Age,	...	...	...	...	2	28	26	56
Causes not ascertained,	...	...	...	...	...	...	...	31
	85	298	453	565	514	289	72	2307

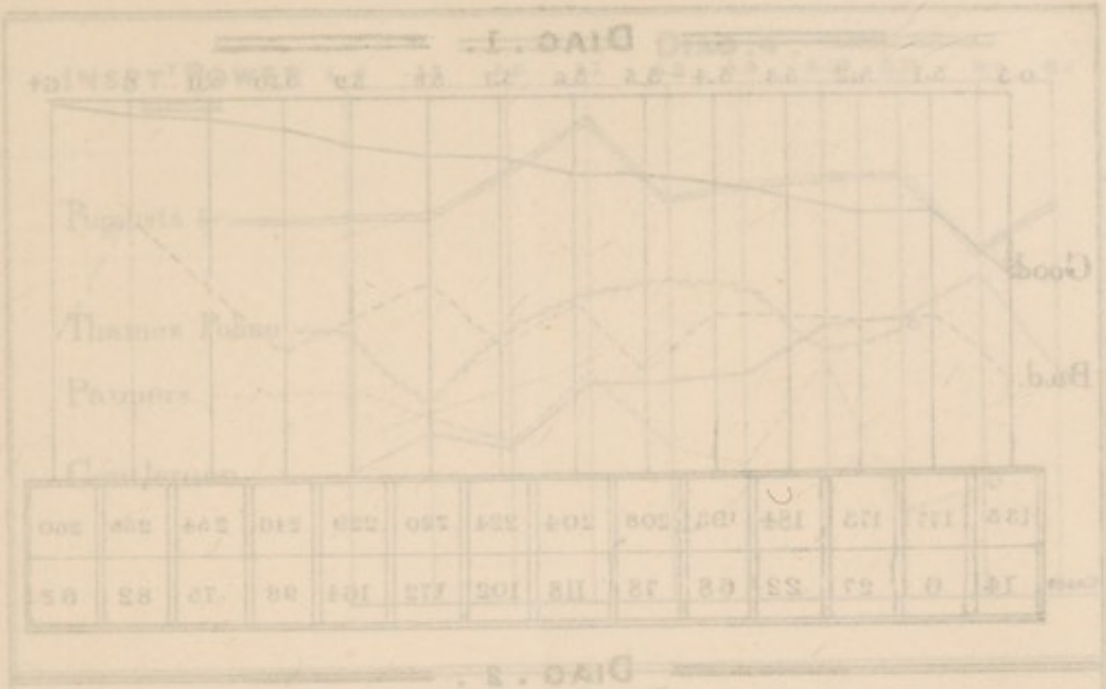
TABLE.

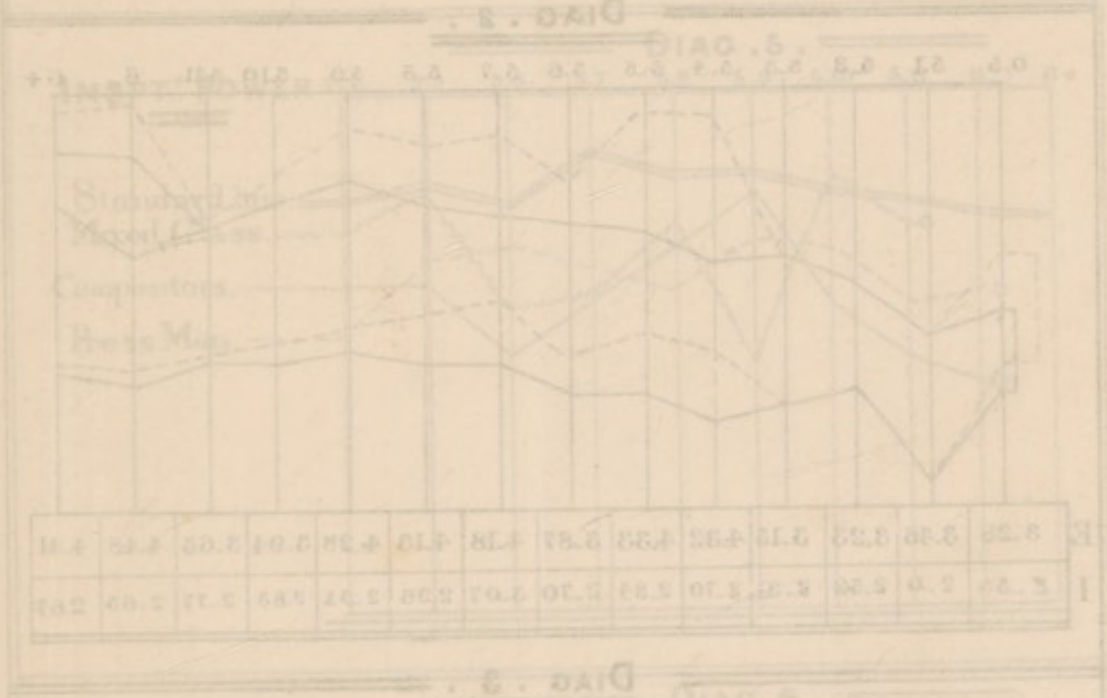
SHOWING (1.) *The Calculated Number of Lives at risk for the Seven Years from 31st December 1852 to 31st December 1859, arranged quinquennially,* ACCORDING TO AGE AT THE COMMENCEMENT OF THE SEPTENNIAL PERIOD; (2.) *The Number of Deaths during the Period;* (3.) *The Causes of Death arranged Alphabetically;* and (4.) *The intensity of the various Diseases or Causes of Death measured by the ratio the decrements bear to the original Numbers at risk at the respective Ages.**

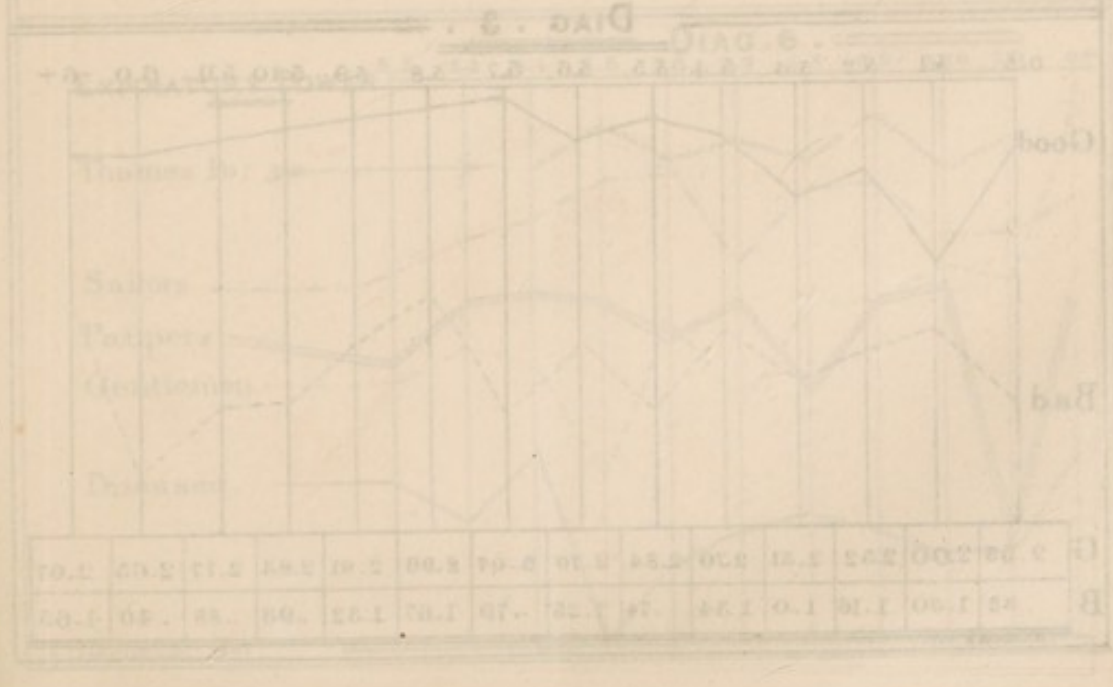
CAUSES OF DEATH.	NUMBER OF LIVES AT RISK, 31st DECEMBER 1852 TO 31st DECEMBER 1859.																								CAUSES OF DEATH.
	455.		803.		1275.		1470.		1405.		1209.		906.		602.		412.		241.		130.		40.		7.		2.		8957.†		
	AGE, 13 to 25.		AGE, 26 to 30.		AGE, 31 to 35.		AGE, 36 to 40.		AGE, 41 to 45.		AGE, 46 to 50.		AGE, 51 to 55.		AGE, 56 to 60.		AGE, 61 to 65.		AGE, 66 to 70.		AGE, 71 to 75.		AGE, 76 to 80.		AGE, 81 to 85.		AGE, 86 to 90.		ALL AGES.		
	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Number of Deaths.	Mortality per cent.	Total Number of Deaths.	Mortality per cent. of each Disease on all Ages.	
Abscess,	...	...	...	...	...	...	1	.0680	1	.0712	...	...	1	.1104	...	...	...	...	...	...	...	...	...	...	...	...	3	.0335	Abscess.
Aneurism,	...	...	...	...	...	...	1	.0680	1	.0712	1	.0827	4	.4415	2	.3321	1	.3427	1	.4149	...	...	...	...	...	...	11	.1228	Aneurism.
Apoplexy,	2	.4396	...	...	2	.1569	4	.2721	7	.4982	14	1.1580	8	.8830	4	.6644	9	1.9417	12	4.8792	3	2.3077	3	7.5000	...	...	...	...	67	.7480	Apoplexy.
Asthma,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.1661	...	...	...	...	...	...	...	...	...	...	...	...	1	.0112	Asthma.
Atrophy,	...	...	2	.2491	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.4149	...	...	...	...	...	...	...	...	3	.0335	Atrophy.
Bladder, Chronic Disease of,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1.6597	1	.7692	...	...	...	...	...	...	5	.0558	Bladder, Chronic Disease of.
Bowels, Ulceration of,	...	...	...	...	...	...	1	.0680	...	...	1	.0827	1	.1104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	.0335	Bowels, Ulceration of.
Brain, Chronic Disease of,	2	.4396	2	.2491	6	.4706	9	.6122	10	.7117	6	.4963	8	.8830	4	.6644	7	1.6990	7	2.9046	4	3.0769	1	2.5000	...	...	...	...	66	.7368	Brain, Chronic Disease of.
Bronchitis,	...	...	...	...	1	.0784	2	.1361	1	.0712	3	.2481	4	.4415	9	1.4950	9	2.1845	8	3.3195	5	3.8461	2	5.0000	...	...	...	...	44	.4912	Bronchitis.
Cancer,	...	...	...	...	...	...	3	.2041	2	.1423	3	.2481	3	.3311	1	.1661	1	.2427	...	...	...	...	...	...	1	14.2857	...	...	28	.3125	Cancer.
Cephalitis,	...	...	...	...	...	...	3	.2041	2	.1423	1	.0827	2	.2207	1	.1661	...	...	...	...	...	...	...	...	...	...	...	...	9	.1005	Cephalitis.
Childbirth,	...	...	1	.1245	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.0112	Childbirth.
Cholera,	...	...	...	...	1	.0784	3	.2041	2	.1423	5	.4136	3	.3311	1	.1661	1	.2427	...	...	1	.7692	...	...	...	...	...	...	17	.1898	Cholera.
Consumption,	4	.8791	11	1.3699	10	.7843	15	1.0204	6	.4270	9	.7444	5	.5519	4	.6644	2	.4854	...	...	...	...	...	...	...	...	...	...	66	.7368	Consumption.
Cystitis,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.4149	1	.7692	...	...	...	...	...	...	2	.0223	Cystitis.
Delirium Tremens,	...	...	1	.1245	3	.2353	...	...	2	.1423	1	.0827	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	.0781	Delirium Tremens.
Diabetes,	...	...	...	...	1	.0784	...	...	1	.0712	...	...	1	.1104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	.0447	Diabetes.
Diarrhœa,	1	.2198	...	...	...	...	1	.0680	...	...	1	.0827	...	...	1	.1661	1	.2427	...	...	2	1.5385	...	...	...	...	...	...	7	.0781	Diarrhœa.
Dropsy,	...	...	...	...	...	...	1	.0680	...	...	1	.0827	1	.1104	...	...	...	...	1	.4149	...	...	...	...	...	...	...	...	4	.0447	Dropsy.
Dropsy (Ovarian),	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.2427	...	...	...	...	...	...	...	...	...	...	1	.0112	Dropsy (Ovarian).
Dysentery,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	.1116	Dysentery.
Epilepsy,	...	...	...	...	...	...	...	...	...	...	1	.0827	1	.1104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	.0223	Epilepsy.
Erysipelas,	...	...	1	.1245	1	.0784	...	...	1	.0712	...	...	...	...	2	.3322	...	...	...	...	2	1.5385	2	5.0000	...	...	...	...	9	.1005	Erysipelas.
Fever (Continued),	4	.8791	2	.2491	7	.5490	7	.4762	3	.2135	3	.2481	7	.7726	8	1.3289	4	.9708	1	.4149	2	1.5385	...	...	...	...	...	...	48	.5359	Fever (Continued).
Gastritis Enteritis,	...	...	...	...	2	.1569	1	.0680	1	.0712	2	.1654	1	.1104	...	...	1	.2427	...	...	1	.7692	...	...	...	...	...	...	9	.1005	Gastritis Enteritis.
Gout,	...	...	...	...	...	...	...	...	...	...	1	.0827	1	.1104	...	...	2	.4854	...	...	...	...	...	...	...	...	...	...	4	.0447	Gout.
Hæmatemesis,	...	...	...	...	...	...	1	.0680	...	...	...	...	1	.1104	3	.4983	1	.2427	...	...	1	.7692	...	...	...	...	...	...	7	.0781	Hæmatemesis.
Heart, Chronic Disease of,	...	...	2	.2491	3	.2353	2	.1361	15	1.0675	10	.8271	20	2.2074	23	3.8206	19	4.6116	12	4.9792	11	8.4615	5	12.5000	...	...	...	...	122	1.3620	Heart, Chronic Disease of.
Hepatitis,	...	...	...	...	1	.0784	...	...	...	...	1	.0827	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	.0223	Hepatitis.
Hydrophobia,	...	...	...	...	...	...	...	...	...	...	1	.0827	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.0112	Hydrophobia.
Hydrothorax,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	.0781	Hydrothorax.
Ileus,	1	.2198	...	...	...	...	1	.0680	2	.1423	1	.0827	...	...	1	.1661	1	.2427	...	...	1	.7692	1	2.5000	...	...	...	...	5	.0558	Ileus.
Inflammation,	...	...	...	...	...	...	1	.0680	...	...	...	...	1	.1104	1	.1661	...	...	...	...	1	.7692	1	2.5000	...	...	...	...	2	.0223	Inflammation.
Influenza,	...	...	...	...	...	...	1	.0680	...	...	...	...	1	.1104	1	.1661	1	.2427	2	.8298	...	...	...	...	...	...	...	...	6	.0670	Influenza.
Insanity,	...	...	...	...	1	.0784	...	...	1	.0712	...	...	1	.1104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	.0335	Insanity.
Ischuria,	...	...	...	...	...	...	...	...	1	.0712	...	...	...	...	...	...	1	.2427	...	...	...	...	...	...	...	...	...	...	2	.0223	Ischuria.
Jaundice,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.1661	...	...	...	...	...	...	...	...	...	...	...	...	1	.0112	Jaundice.
Joints, Chronic Disease of,	...	...	...	...	...	...	1	.0680	1	.0712	1	.0827	...	...	...	...	...	...	2	.8298	1	.7692	...	...	...	...	...	...	5	.0558	Joints, Chronic Disease of.
Kidney, Chronic Disease of,	1	.2198	2	.2491	2	.1569	2	.1361	3	.2135	7	.5790	3	.3311	7	1.1628	7	1.6990	2	.8298	1	.7692	2	5.0000	...	...	...	...	39	.4354	Kidney, Chronic Disease of.
Laryngitis,	...	...	...	...	1	.0784	1	.0680	...	...	...	...	...	...	...	...	1	.2427	1	.4149	...	...	...	...	...	...	...	...	4	.0447	Laryngitis.
Liver, Chronic Disease of,	...	...	2	.2491	...	...	9	.6122	7	.4982	8	.6617	8	.8830	5	.8306	2	.4854	2	.8298	5	3.8461	1	2.5000	...	...	...	...	49	.5470	Liver, Chronic Disease of.
Lungs, Chronic Disease of,	...	...	...	...	3	.2353	3	.2041	3	.2135	3	.3481	2	.2207	3	.4983	5	1.2136	1	.4149	1	.7692	1	2.5000	...	...	...	...	25	.2791	Lungs, Chronic Disease of.
Mortification,	...	...	...	...	...	...	...	...	...	...	1	.1104	2	.3322	2	.4854	...	...	1	.7692	...	...	...	...	...	...	...	...	6	.0670	Mortification.
Old Age,	...	...	...	...	...	...	...	...	...	...	...	...	2	.3322	2	.4854	6	2.4864	8	6.1538	6	15.0000	3	42.8571	2	100.	29	.3237	Old Age.
Paralysis,	...	...	1	.1245	2	.1569	2	.1361	6	.4270	10	.8271	10	1.1037	11	1.8272	10	2.4272	10	4.1494	12	9.2307	5	12.5000	...	...	...	...	79	.8819	Paralysis.
Pericarditis,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	.3321	...	...	...	...	...	...	...	...	...	...	...	...	2	.0223	Pericarditis.
Peritonitis,	3	.6593	...	...	1	.0784	...	...	2	.1423	1	.0827	1	.1104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	.0893	Peritonitis.
Pleurisy,	...	...	1	.1245	1	.0784	...	...	1	.0712	1	.0827	1	.1104	2	.3322	...	...	...	...	...	...	...	...	...	...	...	...	7	.0781	Pleurisy.
Pneumonia,	1	.2198	...	...	2	.1569	5	.3401	5	.3558	5	.4136	5	.5519	8	1.3289	3	.7281	3	1.2448	4	3.0769	1	2.5000	...	...	...	...	42	.4689	Pneumonia.
Rheumatism,	...	...	...	...	...	...	4	.2721	...	...	1	.0827	1	.1104	1	.1661	...	...	...	...	...	...	...	...	...	...	...	...	7	.0781	Rheumatism.
Scarlatina,	1	.2198	...	...	...	...	2	.2041	1	.0712	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	.0558	Scarlatina.
Scrofula,	...	...	...	...	...	...	1	.0680	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.0112	Scrofula.
Small Pox,	1	.2198	..	...	1	.0784	1	.0680	...	...	1	.0827	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	.0447	Small Pox.
Spine, Chronic Disease of,	1	.2198	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.2427	...	...	...	...	...	...	...	...	...	...	2	.0223	Spine, Chronic Disease of.
Stomach & Bowels, Chronic Disease of,	...	...	...	...	1	.0784	4	.2721	1	.0712	5	.4136	4	.4415	6	.9967	2	.4854	5	2.0747	3	2.3077	...	...	...	...	...	...	31	.3461	Stomach & Bowels, Chronic Disease of.
Sudden Death,	...	...	...	...	1	.0784	...	...	...	...	1	.0827	1	.1104	1	.1661	...	...	...	...	1	.7692	...	...	...	...	...	...	5	.0558	Sudden Death.
Tetanus,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.1661	...	...	...	...	...	...	...	...	...	...	...	...	1	.0112	Tetanus.
Tumour,	...	...	...	...	...	...	...	...	...	...	...	...	2	.2207	...	...	1	.2427	...	...	...	...	...	...	...	...	...	...	3	.0335	Tumour.
Violent Death,	1	.2198	3	.3736	8	.4374	2	.1361	5	.3558	3	.2481	5	.5519	1	.1661	1	.2427	...	...	...	...	...	...	...	...	...	...	29	.3238	Violent Death.
Causes not specified or ascertained,	...	...	...	...	...	...	1	.0680	...	...	...	...	1	.1104	...	...	1	.2427	...	...	...	...	...	...	...	...	...	...	3	.0334	*Causes not specified or ascertained.*
Total number of Deaths, and percentages of Mortality,	23	5.0551	31	3.8606	62	4.8625	97	6.5984	94	6.6899	113	9.3462	122	13.4658	130	21.5939	108	26.2128	85	35.2692	74	56.9226	30	75.0000	4	57.1428	2	100.	975†	10.8846	*Total number of Deaths, and percentages of Mortality.*

* Prepared by the ACTUARY of the Society.

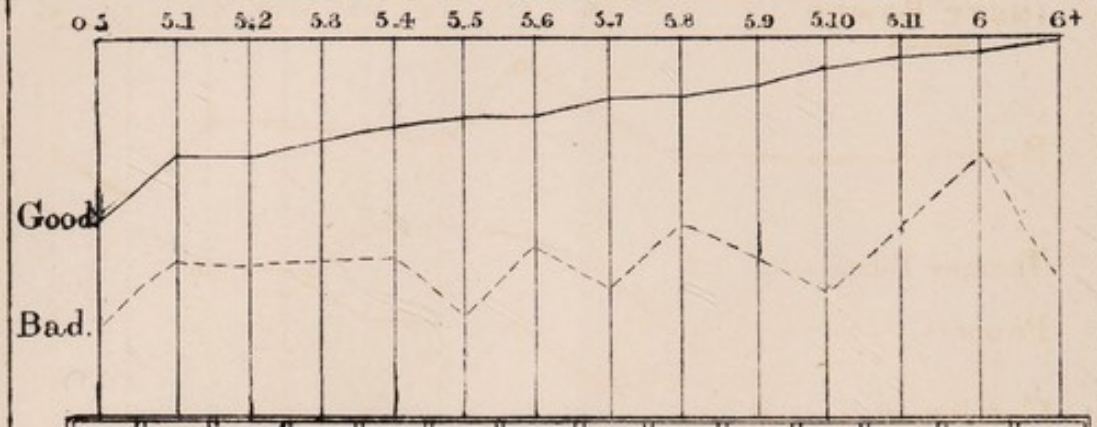
† The number of Lives at risk, and the number of Deaths which occurred during the Septennium, were, as stated in the Society's Septennial Report, page 14, 8973 and 991 respectively. Of these, 16 Persons were connected with Assurances which did not become payable at their Deaths, and the usual Returns of the Causes of Death were not received. The reduced numbers are only used in the Table.





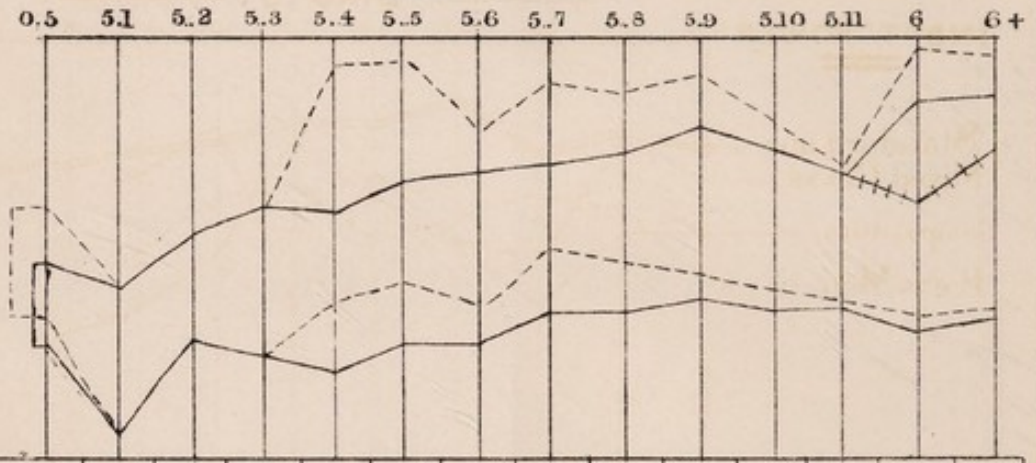


DIAG. 1.



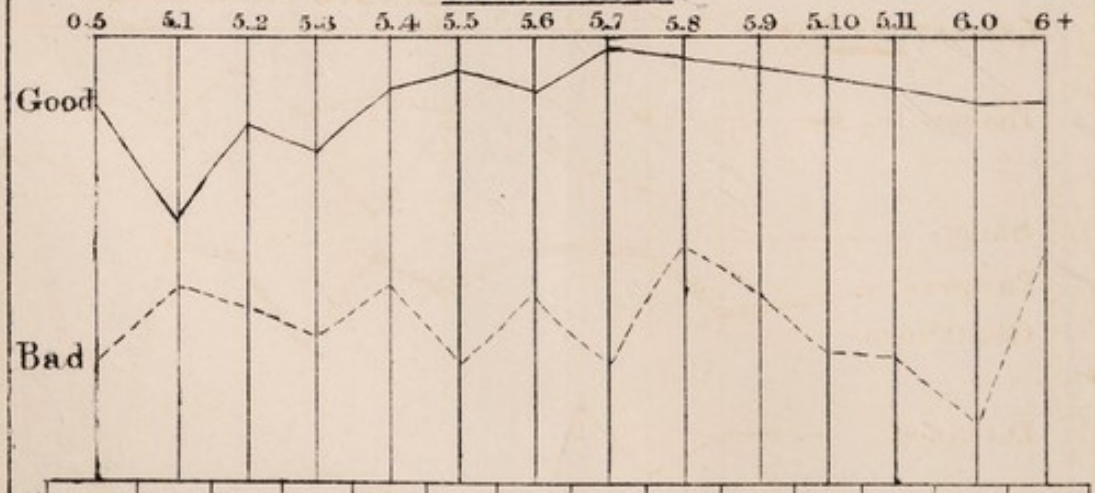
	135	177	173	184	193	208	204	224	220	239	246	254	255	260
Cases	14	6	27	22	68	78	118	102	172	164	98	75	82	62

DIAG. 2.



E	3.28	3.36	3.23	3.15	4.32	4.33	3.87	4.18	4.13	4.28	3.94	3.63	4.48	4.41
I	2.55	2.0	2.52	2.31	2.70	2.84	2.70	3.07	2.96	2.91	2.83	2.77	2.65	2.67

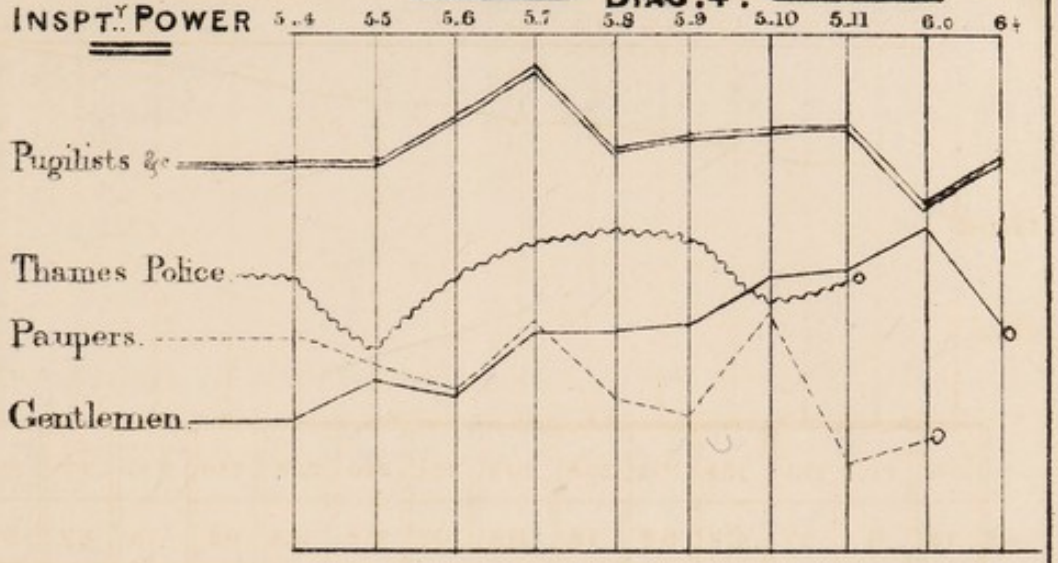
DIAG. 3.



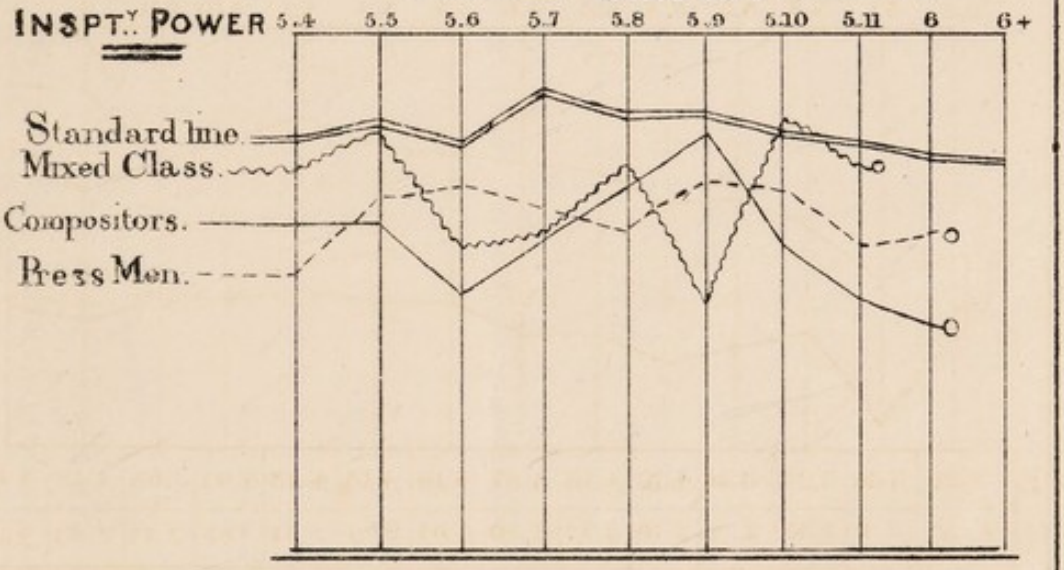
G	2.55	2.00	2.52	2.31	2.70	2.84	2.70	3.07	2.96	2.91	2.83	2.77	2.65	2.67
B	.82	1.30	1.16	1.0	1.34	.74	1.25	.79	1.67	1.32	.93	.88	.40	1.65

J. Arrest Lithe. 59 Greek St. Soho Square.

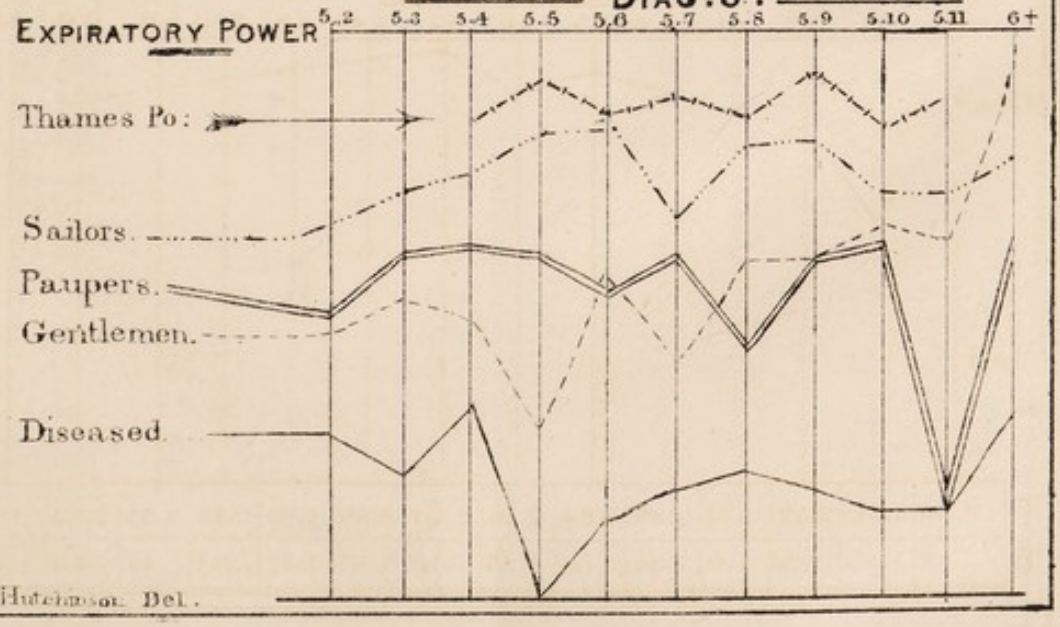
DIAG. 4.



DIAG. 5.



DIAG. 6.



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