

**Report on the deaths among the assured in the Standard Life Assurance Company for the period from 15th November, 1850, to 15th November, 1855.**

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# REPORT

ON THE

## DEATHS AMONG THE ASSURED

IN THE

### STANDARD LIFE ASSURANCE COMPANY

FOR THE PERIOD FROM 15<sup>TH</sup> NOVEMBER 1850  
TO 15<sup>TH</sup> NOVEMBER 1855.

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# RECORD

DEATHS AMONG THE ASSURED

ISSUED BY THE ASSURANCE COMPANY

THE ASSURANCE COMPANY  
OF THE CITY OF LONDON

CHURCHILL

PRINTED BY E. & J. B. HARRISON, STATIONERS

# REPORT.

THIS being the second occasion on which it has been my duty to undertake a scrutiny of the "Emerged Risks" of the Standard Life Assurance Company for a period of five years, I shall arrange my observations with reference to the general results brought out on the former occasion, and upon the same general principles as before.

The following Table shews the number of deaths referrible to each disease in the two quinquennial periods:—

	PERIOD.		PERIOD.	
	First.	Second.	First.	Second.
I. <i>Gradual Decay</i> . . . . .	...	..	12	14
II. <i>Epidemic and Infectious Diseases.</i>				
1. Typhus . . . . .	37	30		
2. Gastric Fever . . . . .	1	7		
3. Tropical Fevers, Yellow and Remittent	1	3		
4. Malignant Cholera . . . . .	20	6		
5. Small Pox . . . . .	2	2		
6. Scarlatina . . . . .	2	3		
7. Erysipelas . . . . .	6	3		
			69	54
III. <i>Diseases of the Brain and Nervous System.</i>				
1. Apoplexy and Palsy . . . . .	41	45		
2. Chronic Disease of the Brain . . . . .	3	20		
3. Inflammation of the Brain . . . . .	1	9		
4. Epilepsy . . . . .	3	3		
5. Delirium Tremens . . . . .	2	8		
6. Tetanus . . . . .	3	0		
7. Spine Disease . . . . .	0	1		
8. Insanity . . . . .	0	5		
9. Chorea . . . . .	0	1		
			53	92
IV. <i>Diseases of the Respiratory Organs.</i>				
1. Diseases of the Throat and Tongue . . . . .	3	5		
2. Pneumonia and Pleurisy . . . . .	20	26		
3. Bronchitis and Influenza . . . . .	15	16		
			38	47



	PERIOD.		PERIOD.	
	First.	Second	First.	Second.
V. <i>Diseases of the Organs of Circulation.</i>				
1. Diseased Heart . . . . .	16	37		
2. Diseases of the Blood-Vessels . . . . .	5	3		
3. Hæmorrhage . . . . .	2	0		
4. Spontaneous Gangrene . . . . .	1	0	24	40
VI. <i>Diseases of the Organs of Locomotion.</i>				
1. Rheumatism . . . . .	0	2		
2. Gout . . . . .	0	1	0	3
VII. <i>Diseases of the Digestive Organs.</i>				
1. Diseased Stomach . . . . .	11	7		
2. Diseased Liver . . . . .	11	23		
3. Diseased Spleen . . . . .	1	0		
4. Dysentery and Diarrhœa . . . . .	11	12		
5. Perforation of the Bowels . . . . .	0	1		
6. Obstruction of the Bowels . . . . .	1	9		
7. Inflammation of the Peritoneum . . . . .	0	3	35	55
VIII. <i>Diseases of Urinary and Generative Organs.</i>				
1. Diseased Kidneys . . . . .	4	14		
2. Diseased Bladder . . . . .	2	3		
3. Diseased Uterus . . . . .	2	4	8	21
IX. <i>Diseases of Depraved Constitutional Habits.</i>				
1. Malignant Diseases . . . . .	3	5		
2. Consumption . . . . .	29	60		
3. Mesenteric Disease . . . . .	0	1	32	66
X. <i>Surgical Diseases.</i>				
1. Carbuncle . . . . .	0	2		
2. Effects of Amputation . . . . .	0	1	0	3
XI. <i>Violent Death.</i>				
1. Accidental Injuries . . . . .	3	7		
2. Drowning . . . . .	5	11		
3. Starvation . . . . .	1	0		
4. Poison . . . . .	0	1		
5. Suicide by Hanging . . . . .	0	1	9	20
XII. <i>Diseases of Uncertain Seat.</i>				
1. Dropsy . . . . .	10	3		
2. Cause not ascertainable, or not stated . . . . .	3	6	13	9
TOTAL . . . . .	...	...	293	424

The deaths are therefore nearly one-half more numerous in the newer than the earlier period; a result which was to be anticipated from the greater age of the Company, and the still increasing extension of its business.



I. The proportion of deaths, vaguely referred to *Gradual* or *Natural decay*, has been reduced during the last quinquennial period, owing to greater accuracy in the certificates of death. In fact, ten of the fourteen have actually survived beyond their seventy-fifth year, and half of these beyond their eightieth; so that some of the references to this head have probably been correctly designated death from Gradual Decay. Still, however, it must be stated as before, that most old people die of a special disease, and not of the gradual wearing out of the powers of life.

In the preceding period only two cases of gradual decay, out of twelve, outlived their expectation of life; and the survivancy of each of the twelve, after acceptance, amounted on an average to 10.25 years, instead of 14.6, their average expectation-term. In the newer period, eight of fourteen outlived their expectation of life by an average of four and a half years; and the average survivancy of the whole fourteen was 12.7 years each, being an excess of 1.2 over their average expectation-term.\*

A decided improvement in the Company's favour has also taken place among *Old-age risks* generally. In my former Report, I entered somewhat largely into the peculiarities of this important branch of the Company's business. At present, it will be sufficient to confine myself to a few salient points of interest.

In the first place, the deaths among old-age risks, or those assured at 60 or later, are proportionally fewer than in the previous quinquennium, viz., 42 in the later, and 56 in the earlier period—that is, ten per cent of the total mortality instead of 19.1. The greater age of the Company, and other peculiarities in its history,

\* In this Report, as well as in the previous Report which I made on the deaths among the Assured in this Company, I have adopted the plan of comparing the actual number of years which the persons assured have survived after acceptance, with the average probability of life which they had at the date of acceptance, according to the Carlisle Tables. In doing this, I do not forget that a certain amount of mortality is expected each year, and I am aware that no large body of persons could live to their average expectation, according to the Carlisle Tables, without deaths occurring, however careful the selection; but it is no less a fair mode of comparison, as the greater the number of persons who come nearer to the calculated average of life, the more favourable will be the results for the Company. The calculations of the Actuary of the Company show how greatly the expected deaths have exceeded the actual deaths during the last two years, viz.—

	1856.	1857.
Expected Deaths . . . . .	113.5	124.7.
Actual Deaths . . . . .	87.	99.
Difference in favour of the Company . . . . .	26.5	25.7

And this is a good proof of the great caution with which the business has been transacted; but the experience of death, compared with the expectation of life, is, at the same time, an instructive mode of considering the power of selection.



will in part account for this ; but something may justly be ascribed also to the greater accuracy of the Company's certificates, at entry, having increased the means of avoiding doubtful risks in a class of cases, as to which it is both most important and most practicable to obtain precise information concerning personal and family healthiness.

Secondly, There has been a marked increase over the previous quinquennium in the average survivancy of these old-age risks. In the early period this was only six years for each, instead of twelve years, their average expectation of life. In the newer one, it has been 9.3, instead of 11.8 years. Of the forty-two, 3 died before sixty-five ; 10 between that and seventy ; 11 between that and seventy-five ; 12 between that and eighty ; 4 between that and eighty-five ; and 2 above eighty-five, of whom one died at ninety-one.

Thirdly, It was shown in my last report that the main causes of mortality, to be dreaded among old-age risks, were a very few diseases only, viz., apoplexy and palsy, bronchitis and pneumonia, diseases of the heart, and dysentery and diarrhoea. So, too, in the recent quinquennium, these diseases account for a large proportion of deaths, for no less in fact than sixty per cent, excluding death from gradual decay ; and no other disease is at all predominant. The only difference between the two periods is, that dysentery and diarrhoea, which accounted for 5 deaths during the earlier period, do not appear in the newer period at all. This is conformable with the fact, that in the former period there was a constitutional tendency in this country to diarrhoea, dysentery, cholera, and other bowel affections.

Fourthly, It is remarkable that there has not been a single death from consumption among the old-age risks, either in the recent or earlier quinquennium. In ten years no case of consumption has occurred among 98 deaths, arising among those assured after the age of sixty.

II. In the class of *Epidemic* and *Infectious diseases*, there has been a diminution from sixty-nine in the earlier period to fifty-four in the later—that is, from 23.5 per cent to 12.8 per cent of the total mortality. The reduction is mainly to be ascribed to the disappearance of malignant cholera, and the cessation of continued fever as an epidemic.



It is somewhat remarkable that there are seven deaths from *Gastric fever* in the new period against one death only in the earlier one. This is a large number of deaths from that disease. But it does not surprise me ; for I have had occasion to remark that an unusual number of severe gastric or bilious fevers have come under my care in the middle ranks of life during the years 1850-1-2-3-4.

The decrease of deaths from *Typhus*, viz., from thirty-seven to thirty—that is, from 12.66 to 7.1 per cent of the total mortality among the assured, is conformable with the cessation of fever as an epidemic in the United Kingdom, especially in Ireland. I may mention, as an interesting occurrence, that fever has not been so restricted in the population of Edinburgh for more than thirty years as at present. During our epidemic of 1847-48, the greatest we have ever known, 8,400 cases of fever were admitted into the Royal Infirmary. In 1854-55, together, there were only 369. And there has been no reduction nearly approaching this since 1823-24, when the conjunct number was 279.

The head of fever shows an appreciable improvement to the Company's advantage, in the survivancy of the assured who have died during last quinquennium, compared with the preceding one. The latter survived acceptance by only a sixth part of their expectation of life ; the former by about a fourth of that period, viz., 7.4 years each, instead of 31.5, the average expectation-term. Still, this result shows that fever is one of the most serious sources of loss to an Assurance Company. And it is all the more so, inasmuch as the newer period confirms the experience of the older, that fever by no means singles out the less eligible lives, but assails the best equally with the mere average lives.

There has been only one death from *Malignant Cholera* since November 1854, and that was among the Irish risks in January 1855.

III. There has been apparently a slight increase among the deaths from *Diseases of the Brain and Nervous system*. In the early period fifty-three, in the later ninety-two deaths arose from this class of diseases—that is, 18.1 per cent in the former, and 21.7 in the latter, an immaterial difference, which will disappear if the excess of fever in the earlier period be deducted from the total mortality.



*Apoplexy, Palsy, and Chronic Cerebral disease*, all closely allied to one another, account for sixty-five of the ninety-two in the new period, or fifteen per cent of the whole mortality among the assured, which is exactly the proportion in the previous quinquennium also. It will be obvious, therefore, how important these sources of mortality are to the operations of an Assurance Company. They are important chiefly after the age of forty-five, for only eight of the sixty-five died under that age. In my last report, I showed that this is a class of diseases against which it will not be easy to provide more security than by the present rules observed by the Directors in accepting proposals of assurance.

It is satisfactory, however, to observe that an improvement has taken place in the average survivancy of these emerged risks. In the earlier quinquennium, each survived only a third part of his expectation of life. In the newer quinquennium, each survived nearly one-half the natural term—that is, 11.0 years on an average, instead of 22.5.

The professions principally exposed to these diseases cannot be safely inferred from so limited a scale of observation. In the former report, it was rather startling to find a very prominent place occupied by non-professional gentlemen. At the present period, it is somewhat surprising to find the clergy and landed gentry decidedly at the head of the list. The 65 deaths are diffused throughout 35 professions; 27 furnish only one death each; writers, medical men, farmers, merchants, and bakers, furnish each two; writing clerks three; but landed proprietors seven; and clergymen nine.

The table shows a lamentable increase of deaths from *Delirium tremens*, viz., from two to eight. On this head all I have to say is, that in every instance there has been apparently satisfactory evidence that the vice of excessive intemperance was not contracted till some time after acceptance.

Medical men may be surprised to find a case of *Chorea*, or St. Vitus' dance, among the deaths. But it was well made out, by no less an authority than Dr. Hodgkin of London. And I may add, that I myself met with a fatal case two years ago, the only one I have ever encountered—death arising from gradual exhaustion, the result of uninterrupted and increasingly violent agitation of the face, head, and limbs.



IV. *Diseases of the Respiratory organs*, consumption being excluded, account for 47 deaths, or eleven per cent of the total mortality. I have no particular remarks to make on this head.

V. There has been apparently a decided increase among the deaths from *Diseases of the Circulation*, especially diseased heart, which alone accounts for 37 deaths in the recent quinquennium, and only sixteen in the previous one—that is, 8.34 per cent, instead of 5.4 per cent. The increase is partly owing to the nearly total extinction of the category of *dropsy* in the Table, most of the cases of which are really cases of diseased heart, of which dropsy is a mere symptom.

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. 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.

It must be noticed, however, that probably in no other source of latent risk can so much be already effected to keep down the loss. Attention to family history, but still more a careful examination of the chest by the stethoscope, have enabled the medical officers of the Company to exclude many very hazardous proposals, which would undoubtedly have been accepted under a less particular system of examination; and several striking instances of the kind have occurred to myself, as the Company's examining officer at head-quarters—cases which it might be well to refer to more particularly, were it not necessary to consult brevity in this report.

VI. *Diseases of the organs of Locomotion* supply three deaths in the last quinquennium—two from *Rheumatism*, and one from *Gout*. Gout rarely figures as a cause of death in the Company's returns. But it must not be supposed that the gouty constitution is thereby proved to be harmless in respect of longevity; for the question is, whether other diseases are not more apt to arise in



this constitution? and the reply must, I fear, be in the affirmative. An analysis of the Company's Gout-risks may one day settle it more satisfactorily.

VII. *Diseases of the Digestive Organs* account for 55 deaths in the last quinquennium against 35 in the previous one; which amounts in each to about 13 per cent. I have no particular remarks to make under this head.

VIII. Under *Diseases of the Urinary and Generative Organs*, there has been apparently a slight increase from eight to twenty-one—that is, from 2.7 to 5.0 per cent, which is mainly to be ascribed to the extinction of the head of *dropsy*, throwing some cases upon the list of kidney diseases, one form of which is a frequent cause of dropsy.

IX. Some points of minor consequence have been passed by in the preceding classes of disease, for brevity's sake, in order that I may enter more fully into the most important of all subjects connected with the present report—that class of diseases which depend on what are called *Depraved Constitutional Habit*. Under this head, there is a decided increase in the late quinquennial period, viz., from 32 to 66—that is, from 11.0 to 15.6 per cent of the total mortality among the assured.

This increase falls entirely upon *Consumption*, to which disease I shall at present confine my attention. There is under this head an increase from 29 to 60—that is, from 10.0 to 14.2 per cent of the whole mortality.

I may observe at the outset of this branch of my Report, that the Company's data have here a greater value than under any other head, because the conclusions to be drawn from statistical enquiry are more exempt from the disturbing influences of the Company's comparative youth, and steadily increasing business. The reason is, that lives liable to drop from consumption fall at a very early period after acceptance. Of the 60 deaths in the last quinquennium, no fewer than 55 fell at or before the completion of the tenth year after acceptance;\* and of these, 30 actually fell at or before the completion of the fifth year only.

\* The other five survived from 12 to 19 years, on an average 14, the average survivancy for their periods of life being 34.6 years.



The first remark I have to make on the scrutiny of these deaths is, that no improvement has taken place in the average survivancy, after acceptance, since the result obtained from a scrutiny of the consumptive deaths of the previous quinquennium. In that period each individual attained only the sixth part of his expectation of life. In the recent period, the 60 assured persons survived conjunctly 341 years, instead of 1954, their conjunct expectation of life; that is, each on an average 5.7, instead of 32.6 years—a mere trifle more than a sixth of their natural term of life.

In the second place, the data furnished by the papers do not hold out a hope of much diminution in the proportion of consumptive deaths. Four of the 60 would probably have been avoided under the present method of accepting lives; two because of the very consumptive tendency of their families, and two others on account of personal objections which would now be considered serious obstacles to acceptance. But, except that the information as to thirteen others is incomplete, no objection of moment can be brought against the rest.

Thirdly, the increase in the number and proportion of consumptive deaths may raise at first some doubts as to the efficiency of the present method of diminishing consumptive risks. But I think it admits, on consideration, of being satisfactorily explained. The geometrical ratio of the increase in the Company's business during the last ten years, throws into the count a greater proportion of young lives, among which principally deaths from consumption are found to arise. And it is probable that the increase of the practice of assuring, which is well known to have occurred in the community, has extended to an earlier age also. This would almost appear from the ages at which the deaths from consumption have taken place in the two past quinquennial periods relatively to one another. In the first period, of 29 deaths, only one died before 30, and only seven more before 35; in the second period, of 60 deaths, 13 died before 30, and 11 more before 35. This difference will very nearly account for the apparent increase of consumptive deaths. In the late quinquennium, the 60 deaths from consumption occurred thus, according to age, viz., before completion of the thirtieth year, 13; in the ten years before the fortieth, 27; in the ten years before the fiftieth, 12; in the ten before the sixtieth, 6; and above sixty, 2.



Fourthly, The experience of the last five years confirms the conclusion drawn in my former Report as to the great security with which consumptive risks may be avoided from a period soon after middle life. It is well known now, that, contrary to what was at one time thought, consumption is by no means confined to youth and manhood, but occurs very frequently after middle age, and even in old age, throughout the general population of this country. But it is not so with the population of an extensive Assurance Company. In my former report it was shewn that not a single case had occurred, in the quinquennium included in that retrospect, among those assured after the age of sixty. This proposition holds good equally in the quinquennium now concluded. The following Table proves this fact, and illustrates the rapidly diminishing proportion of deaths from consumption, compared with deaths from all other causes, according as the age at acceptance increases.

TOTAL DEATHS, and DEATHS from CONSUMPTION, among those assured  
at Successive Ages.

Age.	From all Causes.	From Consumption.	Ratio per cent.
Deaths among the assured before 20	10	4	40
Between 20 and 30 . . . . .	70	25	36.2
"    30    "    40 . . . . .	119	20	17
"    40    "    50 . . . . .	108	8	7.4
"    50    "    60 . . . . .	78	3	3.8
Above 60 . . . . .	39	0	0
Total . . . . .	424	60	14.2

Hence it is plain, that in the transactions of a well-conducted Assurance Company, the risk of death from consumption is very small among persons assured after the age of 50, and scarcely exists among those assured after their sixtieth year. Nevertheless it is consistent with the experience of most Companies, that a considerable proportion of Assurances is effected after these ages. In the experience of this Company during the last ten years, of 717 deaths from all causes among the assured, 239 were cases of persons accepted after their fiftieth year, of which number 92 had passed their sixtieth. Of the 239, six died of consumption, or



only two and a half per cent. Among 92 accepted after 60, not a single death arose from that disease. There is no other apparent way of accounting for the low rate of consumptive mortality among those assured after the middle period of life, compared with what is observed in the population at large, except the skilful application of the means for avoiding consumptive risks, by medical inquiry into the family liability, and personal constitution of proposers.

Fifthly. Among the rules for avoiding consumptive risks, one of the most important specified in my last report was, that lives should in general be declined, when two deaths have been occasioned by consumption in the proposer's original family—that is, including his father, mother, brothers and sisters. It has been objected that this exclusion will have so wide an influence, as to circumscribe too much the operations of an Assurance Company. It is supposed that, in consequence of the large proportion of the general mortality which is caused by consumption in the population at large, the disease must be widely disseminated through families. And thus some colour is even given to the opinion of those who will insist that Assurance Companies may disregard family history altogether, and safely accept risks on the simple history of the health and habits of the proposer. In the course of my duties as medical officer of this Company, it has several times occurred to me to observe that the Company's local medical officer expressly disclaimed family constitution as an element of judgment, where the risk of consumption had to be weighed. This doctrine, indeed, is not entirely without recent scientific support, as very lately a paper was read in the Medico-Chirurgical Society of Edinburgh, to prove that tubercle, and pulmonary consumption, its most familiar result, depend on the constitution of each sufferer being "depraved" by the continual breathing of a scanty, vitiated atmosphere. And in this paper the writer asserts the following proposition concerning the prevalent doctrine, that it often originates in family liability. "Tubercle, it matters not whether pulmonary . . . or mesenteric, has been said to be hereditary. Yet there is not a shadow of reason for the hypothesis, except the frequency of tubercle."

I hope, therefore, it will appear neither superfluous nor out of place if I endeavour to put this point on a clear foundation.

No physician of experience and observation can have failed frequently to observe consumption occurring to a fearful degree in



particular families; and these in a condition of life which would render it a pure assumption to ascribe the dire calamity to "a scanty, vitiated atmosphere." During the last three years, I have twice seen a family in the opulent classes of the community extinguished by the death of the sixth brother or sister from consumption. I am acquainted with a gentleman in this city, who, during the same period, lost the seventh of his children from the same cause. Lately a lady in good circumstances, 57 years of age, herself enjoying for many years exemption from all illness, except occasional dyspepsia, made a proposal of assurance to the Standard Assurance Company. But she had lost eight brothers and sisters, out of sixteen, from consumption, at the ages of 16, 16, 20, 20, 26, 32, 39, 43. Another died at 58 of cancer, a disease which may be regarded constitutionally as the equivalent in advanced life of consumption at an earlier period. And one of her parents also probably died of malignant disease in the stomach at the age of 63. To complete the family history, it may be further mentioned, that another brother died at 39 of diseased heart, and her remaining parent at 44 of dropsy. These four family histories, coming under one man's observation in the short period of three years, are simply exquisite examples of a fact, of which some similar and many minor illustrations could be furnished by every practitioner who has enjoyed long experience in the same class of life; a class so circumstanced, that no other cause can be discovered for such grouping of cases of one disease, except family constitutional tendency.

This view of the matter might be confirmed by equally apposite instances of family exemption from phthisis. It is difficult to follow accurately the family history of families through several generations. But, undoubtedly, interesting facts would be thus obtained as to family constitutions and liabilities. The following is a single illustration of exemption from phthisis through four successive generations. The great-grandparents of the family both lived beyond 80. Of their children, seven in number, four lived till between 71 and 91, and none died of consumption. By these, the original pair had 26 adult grandchildren, of whom one in one family, and three in another, died of consumption. In the first of these, the disease was traceable to intermarriage, because in the collateral branch it prevailed in two families of cousins. In the other, the family history of the col-



lateral branch cannot be satisfactorily traced. Through nine of the grandchildren, the original pair had 38 great-grandchildren. The history of one family of these, two in number, cannot be ascertained. Of the remaining 36, of whom eight only are under 16, one has died of consumption; and in that instance the disease came through intermarriage; for two brothers of the collateral parent died of it, and three of one family of cousins. Thus, of 73 members of a race of four generations, comprising 16 families, five persons, in three families, died of consumption; and in one of these the disease could be traced positively, and, in another, probably, to intermarriage with consumptive families. Thirteen families of the sixteen were exempt from the disease. So great an exemption cannot be reasonably ascribed to accidental grouping, but must be owing to family constitution. Many similar instances might be found on enquiry. The other day a gentleman, proposing an assurance to the Standard Assurance Company, stated that among 50 cousins-german there had not been a single case of consumption. But I do not attach great importance to a general statement of this kind, which has not been sifted in its details.

On analysing the experience of an extensive Assurance Company, ample information will in all probability be obtained confirmatory of the preceding statements. It will then be seen, as I venture to predict—1. That family liability to consumption constitutes an important source of additional risk to longevity; 2. That the general rule, to decline risks in families of which two members have already died of consumption, does not unduly circumscribe the transactions of an Assurance Company; and 3. That this rule, while it is a sound general one, admits of exceptions.

In order to contribute some information on these points, I have collated the family histories of the whole proposals of assurance made to the Standard Assurance Company for about four months prior to 9th March last. These are 761 in number, of which, however, 63 must be set aside on account of want of information, in the simplest sense of the word. Of the remaining 698 families, every one has been placed on the consumptive side of the account, in which there was a reasonable probability that consumption had occurred; and no such case has been transferred, merely because it was doubtful, to the unascertained list. The results are, that consumption had occurred once at least in 88 families, and at least twice in 29 of these. Hence the proportion of con-



sumptive families has been one in every eight proposals, on an average; the proportion in which at least two consumptive deaths had occurred has been one in 24; and the proportion of the latter denomination to the former has been one to two, or one in every three consumptive families.

It is not meant to infer from these results that the proportions now given will apply to the population of the country at large. Far from it. The family history of Assurance risks is taken under somewhat peculiar conditions. For, in the first place, it is the history of families in comfortable circumstances. Secondly, the members of the families have not all gone through, and a fair proportion have not even reached, the age when consumption is apt to be developed. And, thirdly, the known practice of this and most other Companies to decline risks in families strongly consumptive, may be supposed sometimes to prevent application by persons who have repeatedly lost immediate relatives from the disease. Therefore we must take the facts as applying in the main only to Assurance practice.

The practical deductions to be drawn from the facts as to the history of the families of 698 proposers to the Standard Assurance Company, are the following:—

1. In an eighth-part of all proposals of Assurance, the family history, by showing the occurrence of one case of consumption, will sound the note of caution; for, in one-third of these families, at least one more case is likely to occur. Caution being thus given, the question of eligibility, in the instance of any such proposal, will turn upon proof—whether other cases of consumption have occurred in the family—whether the proposer, by physical development, or previous illness, or both, betrays the family infirmity of constitution—and whether these, or some of these objections, are either strengthened or counter-balanced by the collateral circumstances mentioned in my former Report.

2. Assurance Companies, which decline under-average risks, should be prepared, as a general rule, to decline about a twenty-fourth part of all proposals on the single ground of the family history presenting a hazardous risk from consumption—this hazard being shown, among other proofs, by two cases of the disease having occurred in the family of a proposer of Assurance.

As already stated above, this rule has been objected to as a general one, on the ground that it circumscribes too much the



transactions of an Assurance Company. The extent of the limitation is now exactly ascertained, and it embraces a twenty-fourth part of all proposals. This is not so large a proportion as the objectors must have anticipated; and it is reduced to a twenty-eighth by admitted exceptions.

3. But a scrutiny of the experience of the Standard Assurance Company will show that the rule is one essential to safety. For, in the first place, of the 29 families in which at least two cases of consumption have occurred, there have been 13 in which at least one other death has occurred from the same cause. In the whole 29 families there had been 84 deaths from consumption, or almost three on an average in each. In 16 families there had been two, in 5 three, in 2 four, in 3 five, and in 1 eight. Hence, if a deduction may be drawn from so limited a scale of observation, there is a strong presumption that at least one more death from consumption will occur in 45 per cent of families in which two members have already died of that disease—provided, of course, there are survivors of the ages liable to suffer from it. Secondly, however, the note of caution being given, it will be found, on careful inquiry, that in a large proportion of instances in which two deaths have arisen from consumption in a proposer's family, there are other objectionable family or personal points which concur to render his life ineligible for Assurance. From the subjoined note of details of the whole 29 cases,\* it appears

\* It may be interesting to many to see the grounds of judgment in these often embarrassing cases. The details of the whole are therefore here appended in abstract:—

1. Of twelve brothers and sisters, all dead, and four of consumption. One paternal uncle and two maternal aunts also died of it. Proposer once had hæmoptysis, and often cough. *Rejected, though 54.*

2. Three members of the immediate family died of consumption. Information otherwise defective. *Rejected.*

3. Two died of consumption. No other family objection. Personal points good. *Accepted.*

4. Four brothers and sisters died of consumption. No personal objection. *Rejected at 44.*

5. Three brothers and sisters died of consumption. Proposer's own young family decidedly scrofulous. No personal objection apparent. *Rejected at 36.*

6. Father and mother died of consump-

tion before 27, and only sister of an un-stated disease at 30. No personal objection apparent. *Rejected at 31.*

7. Two sisters died of consumption. Proposer a soft, unhealthy-looking young man, who had lately had first jaundice, and then sciatica. *Rejected.*

8. Of ten brothers and sisters, five died of consumption. No personal objection. *Rejected.*

9. Two sisters died of consumption. Proposer a little round-shouldered, active, very healthy man of 26, exactly resembling his father, whose race has been long-lived and exempt from consumption, and not at all like his mother, whose race has been prone to it. *Accepted.*

10. Father and a brother died of consumption, and mother very delicate, at



that in 15 there were both personal and other family objections, besides merely the two consumptive deaths; that in 10 there were only additional, but important, family objections; and that in only four, or about one in seven, was there no material objectionable point of either kind. These four were accepted by the Company.

Sixthly, The deaths in this Company's experience are not yet nearly numerous enough to supply information as to the professions among the assured most prone to suffer from consumption. During the last quinquennium 17 professions supply each only one case, and seven only two each. There are three butchers—a fact,

49. No personal objections. *Rejected at 22.*

11. Mother and two only sisters died of consumption. No brothers. Father died at 55 of an unstated disease. No personal objection. *Rejected.*

12. Two brothers, who were flax-dressers, died of consumption. Personal points good at 36. *Accepted.*

13. Father and brother died of consumption. The whole family died early, except mother, who died at 70 of some pulmonary disease. Has incipient emphysema of lungs at 40. *Rejected.*

14. Of ten brothers and sisters, six dead, two of consumption, three other adults of unstated diseases. Father dead at 47 of cancer. No personal objection. *Rejected at 29.*

15. Father and mother died of consumption. Of five brothers and sisters, all dead before twelve months old. Proposer a weakly-formed baker. *Rejected at 35.*

16. Of seven brothers and sisters, five dead of consumption. Proposer a delicate-looking young married woman, liable to miscarriages. *Rejected.*

17. Two of his brothers and sisters died of consumption. Had pulmonary complaints at 25. Has now enlarged heart, discoverable only by auscultation signs. *Rejected at 50.*

18. Of ten brothers and sisters, five died of consumption. Father and mother died at 59 and 60, of unknown diseases. Proposer a strong, healthy, vigorous person of 46 years. *Rejected.*

19. Of nine brothers and sisters, three died of consumption, and two in infancy; mother at 58 of liver disease. Proposer, now 37, has twice in his life had protracted diarrhoea, and now is recovering from a cold, with suspicious auscultation-signs in apex of left lung. *Rejected.*

20. Two of his brothers and sisters

died of consumption. Proposer, 37, a bleacher, with all personal points good. *Accepted.*

21. Of six brothers and sisters, three dead of consumption, one of liver disease, one of apoplexy. Proposer had been in a warm climate for the effects of pleurisy. *Rejected at 27.*

22. Mother and a brother died of consumption. Himself had pneumonia at 23. *Rejected at 27.*

23. Mother and a brother died of consumption, and two other brothers of unknown diseases. Proposer once had suppurated inguinal glands, and by his own medical man was thought "under par." *Rejected.*

24. Of eight brothers and sisters, two dead of consumption. Proposer strong, healthy-like, and 24; but had pneumonia and fever twelve months before. *Rejected.*

25. Father, mother, and all brothers and sisters, three in number, dead before forty, one of consumption, another probably, the rest of unknown diseases. Proposer's health disordered by husband's desertion. *Rejected.*

26. Two brothers and sisters dead of consumption. Proposer liable to gravel. *Rejected.*

27. Two brothers and sisters dead of consumption, and two brothers of delirium tremens. No personal objection. *Rejected.*

28. Of sixteen brothers and sisters, eight died of consumption, one diseased heart, one of cancer; father probably of malignant stomach disease at 63, and mother of dropsy at 44. Proposer 57, a quakeress, liable to stomach complaints, and once had typhus, but otherwise healthy. *Rejected.*

29. Three brothers and sisters dead of consumption. No personal objection. *Rejected.*



perhaps, worthy of notice, because this occupation is usually held to be comparatively little liable to consumption. Medical men supply four deaths ; farmers and writing clerks, each five ; and grocers six. The remaining six were of the female sex.

The only other important species of depraved constitutional habit is that which engenders *Malignant Diseases*. This head includes Cancer, Scirrhus, Fungus hæmatodes, and some others of less frequent occurrence.

Diseases of this denomination have not hitherto received from Assurance Companies the attention which they appear to me to deserve. They are well known to be most frequent about middle life, and between that and commencing old age. They occur, therefore, chiefly at a period immediately subsequent to that at which many Assurances are effected. Of 717 deaths during the last ten years among those assured in the Standard Assurance Company, no fewer than 426 happened among persons assured for the first time after the age of 40. Death from malignant disease is also frequent—more so than may appear either from the statistical returns of Assurance Companies, or from the mortality tables of the country at large. During the last quinquennium of the Standard Assurance Company, only five deaths are referred to malignant diseases, and three in the previous quinquennium—that is, a trifle above one per cent of the total deaths in ten years. But the majority of deaths referred in the Table to disease of the stomach and disease of the uterus, 24 in number, have also undoubtedly arisen from malignant affections of these organs. Another addition may be confidently made of a fair proportion of 33 deaths referred to disease of the liver. And I apprehend that a further addition must be made of a smaller, yet no insignificant, proportion of 46 deaths ascribed to disease in the bladder, disease in the kidneys, dropsy, and obstruction of the bowels ; since it is no uncommon thing for structural changes of a malignant character to be at the foundation of these disorders. Assuming one-half of the first denomination, a fourth of the second, and a tenth of the third, to have been owing fundamentally to malignant degenerations of some internal organ, we will be under the truth, I apprehend, in thus raising the deaths from malignant diseases to eight per cent of the mortality among persons assured after the age of forty.



It will not be easy to arrive at a more precise result than this from the experience of an Assurance Company. Greater accuracy may be effected by and by in the certificates of the cause of death, as medical men become better acquainted with their object, and the importance of accuracy in them. Accordingly, it is not unworthy of note, that the frequency with which malignant disease is mentioned in the certificates of death received by the Standard Assurance Company has increased since this paper was read to the Medico-Chirurgical Society two years ago. For of 192 deaths between 15th November 1855 and 15th November 1857, six are confidently referred to malignant diseases of the breast, leg, or stomach. But, in point of fact, there is an insuperable obstacle in the way of more definite information; one not to be removed by any amount of zeal or conscientiousness on the part of the certifying physicians. The proof of a disease being malignant in its nature can seldom be obtained, if it affect an internal organ, without an inspection of the body after death; and I regret to say that this is a rare help to Assurance statistics, at all events in the experience of the Standard Company. For the same reason it is vain to turn for better information to the mortality registers of the country at large. More precise information may perhaps be expected from the records of a great hospital, where, as in the Royal Infirmary of Edinburgh, pathological examinations are numerous, carefully made, and faithfully recorded. But various reasons may be stated against accepting results thus obtained as representing the incidents of an Assurance Company. Dr. William T. Gairdner has had the goodness to search for me the Pathological Registers of the Edinburgh Infirmary, which are kept with great accuracy, and the result is, that of 657 inspections there were only 28 in which malignant disease was found in one organ or another; and this number represents merely the relative frequency of malignant alterations of structure, not the frequency of death from that cause. There can be no question that the proportion thus arrived at is materially under what the experience of an Assurance Company would lead to, were it susceptible of an equally rigorous scrutiny.

Assuming in the meantime that malignant disease accounts more or less directly for the death of eight per cent of the subjects of Assurance who die after assuring subsequently to their fortieth year, it is obviously very desirable to possess some means of avoiding such risks. The resources for that purpose, which are



within reach at present, are in general not very precise, and perhaps are not often available. But they are the following:—1. The presence of cutaneous sores or excrescences of a dubious nature—indolent internal tumours, possibly not occasioning inconvenience for a time—suspicious enlargement of the external glands—special symptoms referrible to particular internal organs, such as a great liability to dyspepsia, as being a frequent precursor of scirrhus in the stomach—a progressive general emaciation, without apparent cause, and possibly even without loss of strength or other inconvenience for some months: 2. Proof of a tendency to malignant disease among the members of the immediate family of the proposer: and, 3. Proof of a tendency to scrofulous diseases either in the proposer himself, or among his nearest blood relations.

It is unnecessary to enlarge upon any of these criterions for the present. I may merely, in regard to the last of them, refer to what was said in my former quinquennial report on the apparent connection between the scrofulous and the cancerous constitutions, and add that further experience confirms me in the belief in the community of these constitutional infirmities. It is a common idea with medical men, when they grant health-certificates for the purpose of Assurance, to suppose that when a man who is a member of a decidedly scrofulous family reaches the age of 45 or 50 in a tolerably sound state of health, the family constitutional failing may cease to be regarded. This is a great error. On watching the history of such cases narrowly, it will often be seen that the constitutional infirmity betrays itself at last in an unusual liability to organic diseases of internal organs, in an inferior power of contending with diseases at large, or in the actual development of structural disease of the malignant type.

The last head which attracts attention on account of its frequency among the causes of death is *Violent or Accidental Death*, which accounts for twenty casualties. It is certainly somewhat startling to find that, in the rank of life in which Assurances are principally effected, and without the risks of military or naval life having come into operation, one death in every 21 has been owing to violence during the last five years; and even if we take the previous quinquennium into account, the average for 10 years has been 1 in 25 among 717 deaths.



The accidents of travelling account for seven deaths of the twenty which have occurred during the last five years, two persons having been killed by railway accidents, and five having perished at sea by the shipwreck of great ocean-steamers. Six others have been otherwise drowned; one of these by his own act. Four have been killed by falls; one by an accidental gunshot wound on the moors; and one by monkshood given in the form of tincture by mistake. The twentieth was a case of suicide by hanging.

ROBERT CHRISTISON.



## APPENDIX.

### INTEMPERATE LIVES.

Mr. NEISON, the well-known writer on statistical subjects, having found that, in a population of intemperate livers, 50 per cent die of diseases of the nervous system and digestive organs, while, among other contrasts, the average deaths from these diseases in the general population of England and Wales is only 16 per cent, he has inferred that the prevalence of intemperate habits favours the development of diseases of the nervous and digestive systems. Statistical facts are scarcely required to establish so familiar a proposition.—But, from the same data, Mr. Neison also assumes the converse—which is quite a different matter—viz., that the prevalence of such diseases in a community indicates prevailing intemperance, and their relative prevalence in different communities the comparative ratio of intemperance. Among other examples in illustration, he quotes my former Report in 1851 on the deaths in the Standard Assurance Company, and also the reports of Dr. Begbie on the deaths in the Scottish Widows' Fund Society.—For the per centage of deaths from the diseases in question is 30 in the former Company, and 34 in the latter; facts which, he adds, will not “surprise those who are well acquainted with Scottish people a quarter of a century ago.”

This statement appears in his evidence before the Parliamentary Commission of Inquiry into the Condition of the Army, 1858, p. 323; it is repeated by him in a slightly different shape in an Appendix to the Report of that Commission, p. 510; and it has been republished in the Post Magazine and Insurance Monitor for February 6th, 1858, p. 45. In the last two quarters he observes —“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 thirty-eight years; and those who are familiar with the usages of Scotch society during the greater part of that period may perhaps be not altogether unprepared for such a result.”

These statements, when put into the form of a distinct proposition, amount to the assertion, that in Scotland the habits of the assuring classes, viz., the middle and upper ranks, were so intemperate during the earlier and greater part of the last thirty-eight years—about twenty-five



years ago—that the mortality from the diseases of intemperance was increased to twice its average in the general population in England, and to two-thirds of its average in a pure population of intemperate livers.

A statistician of the eminence of Mr. Neison was bound to look well both to his facts and to his logic, before making such an onslaught on the character of a whole nation. It is doubtful logic, however, to assume, that, because a proposition is proved to be true, its converse is also true. In the present instance, it is easy to admit, as proved, that intemperate habits favour the development of nervous and digestive diseases. But a wholly independent proof is necessary to shew that a great prevalence of these diseases necessarily indicates great intemperance. The same diseases may arise from social circumstances entirely different; and, in point of fact, a cautious statistician would have found out such an influence on carefully considering who are the persons who principally assure their lives in the two great Scotch Companies.

Mr. Neison, however, has been unfortunately not more exact in his facts. There are cogent reasons, manifest to any reflecting physician, why the causes of death in the general population of England, and the causes of death in the population of a Scotch Assurance Company, do not admit of being compared or contrasted for the object of his inquiry. But the best answer to his statement is the real facts of the case which he quotes. Mr. Neison seems to have been unaware that a large proportion of the assured in the two Scotch Companies are Englishmen. This circumstance, on the one hand, vitiates at once his attempted comparison; and on the other, it supplies the means of testing the truth of his proposition by a more severe application of his own criterion—that is, by shewing the extent to which diseases of the nervous and digestive systems prevail in England comparatively with Scotland, in populations of the same rank, pursuing the same employments, and situated alike in all respects, except, it may be, the single point which is questioned—their respective habits of temperance.

The deaths in the Standard Assurance Company, since its institution in 1825 down to the present time, amount to 1154. Of this number 854 have occurred among persons residing in England and Scotland at the time they were assured. Of these 609 were Scotch, and 245 English assurances; and of the former 217, of the latter 85, died of diseases of the nervous and digestive systems. Hence the per-centage of deaths from these diseases was 34.7 in England, and 35.6 in Scotland.

If, therefore, Mr. Neison's test of intemperance is good for anything, it proves, when rigorously applied, that the habits of persons in the same rank of life have been quite the same in Scotland as in England. This is exactly what would have been inferred from general observation by any one personally conversant with the social habits of both countries for the last forty years. In both countries habits of improved temperance commenced considerably before the period assumed by Mr. Neison; and the improvement under which we now live was completed at least twenty-



five years ago—the date at which he supposes it to have been so much needed in Scotland.

So far as I can see, it is a safe application of Mr. Neison's criterion, when we admit that it proves an identity of habits as to temperance between the middle classes in the one and the other country. But it would be by no means a safe application of it to conclude farther, that, because the ratio of deaths from diseases of the nervous and digestive systems is 16 per cent in all England, 34 or 35 in the middle ranks of Great Britain, and 50 in a population of hard drinkers, therefore the middle ranks of Britain belong largely to the intemperate class, and are—alike in England as in Scotland—intemperate in the distressing ratio here assigned. To draw this conclusion would be to compare, as Mr. Neison has done, facts which are not correctly comparable. Were the conclusion just, it would be necessary also to conclude from the facts which are accessible, that, in Scotland at least, intemperance has latterly been on the increase, instead of having been on the wane, as even Mr. Neison seems to admit to have been the case during the last five-and-twenty years. From the year 1835, by which time the business of the Standard Assurance Company had become so extensive, and the deaths so numerous, as to supply an adequate mass of facts, the numerical results, showing the relative prevalence of diseases of the nervous and digestive systems at several progressive periods, stand as in the following Table :—

Periods.	Deaths from all Diseases.	Deaths from Nervous and Digestive Diseases.	Per Centage of the latter.
1835-45	128	41	32
1845-50	129	41	31.8
1850-55	201	73	36.3
1855-58 $\frac{1}{3}$	112	43	38.4
1835-58 $\frac{1}{3}$	570	198	34.75

The deaths among English assurances effected with this Company do not commence so soon, and are not so numerous, as to supply sufficient data for separation into comparative periods. But, confining the attention to Scotch assurances, no man acquainted with the history of Scotland would dream of ascribing the apparent increase of head and digestive diseases to a deterioration of the habits of the middle ranks of the country during the last twenty-five, or, more properly, during the last ten or twelve years. For any change of habits which may have occurred in these periods has been for the better. Yet such is the conclusion to which Mr. Neison must come, according to the test he has adopted.

Had Mr. Neison been a physician, he would have discovered that, besides intemperance, there are other habits of society in these days which



will explain equally well the prevalence of diseases of the nervous and digestive systems. During the last forty years there has been a great increase in the fatigues and excitement and anxieties of business of all kinds in this country, whether we look to the learned professions, or to those connected with commerce and trade. Even war and agriculture have their excitements now, which did not exist, or at least not to the same degree, in former times. This is the true explanation of the large and apparently still growing proportion of deaths in the middle ranks of society from diseases affecting the nervous system and organs of digestion. It is impossible for the present to estimate in numbers the amount of this influence. But every physician of experience must, I apprehend, have observed, that under the improvement which has taken place in the habits of the middle ranks in Britain, the vice of intemperance is a less frequent cause of diseases of the brain and spine, and those of the stomach, liver, and bowels, than the over-confinement of the body, and over-straining and over-stimulating of the mind, which are the lot of most men engaged in active business in the present day. The increase in the excitement and anxiety of business dates its commencement at least forty years back. During that period diseases of the nervous and digestive systems have been certainly very prevalent—in the opinion of medical men more so than at an earlier period. But, no one can doubt, that during that interval there has been a material improvement in the habits of society in point of temperance. It is a matter of common observation, that the spread of railway travelling has introduced some of its speed and intensity into all other acts of business, while the social habits of the business ranks of the community have certainly not deteriorated. In correspondence with this fact, diseases of the nervous and digestive systems have undergone an increase, in Scotland at least, from the very time when railways became widely extended over the country,—if the data supplied by the statistics of the Standard Assurance be allowed to settle the question.

R. C.