

**A contribution to the medical statistics of life assurance with hints on the selection of lives / by John Mann.**

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12

A CONTRIBUTION TO THE  
MEDICAL STATISTICS  
OF  
LIFE ASSURANCE

WITH  
HINTS ON THE SELECTION  
OF LIVES.

PRESENTED  
by the  
AUTHOR.



BY

JOHN MANN, M.R.C.S., L.S.A.,

AND

*Examining Surgeon in the British Empire Mutual Life Assurance Company.*

5032


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## PREFACE.

GENERAL STATISTICS set forth a rule deduced from observations upon all ages and all classes of the community. Medical Statistics, on the other hand, deal with groups or classes of lives which are, more or less, exceptions to the general rule. General Statistics will not be correct in their application to individual lives, although they may present a true average of the community. Medical Statistics, in like manner, do not give a true measure of the life of the individual, but they point out those classes, or groups of lives which rise above, or fall below, the general average.

Medical Statistics can be raised above the regions of conjecture only by a careful observation and study of groups of facts upon a large scale. The personal experience of the most experienced and accurate observer rests on too narrow a basis. It is, therefore, desirable to enlarge that experience by facts derived from a wider field of observation than can fall under the notice of any individual; and also to extend it over a longer space of time than the continuance of one generation.

The first attempt at publishing from Life Assurance experience such groups or separate classes of facts, distributed according to the number of distinct causes of Death, was made by Dr. Begbie, of Edinburgh, in a Report embracing 30 years of the experience of the "Scottish Widows' Fund Life Assurance Company," in January, 1847, in the "Edin-

burgh Medical Journal." This was followed by a second Report, of 7 years' experience, in August, 1853, in the same periodical. In the same journal, Dr. Christison also gave a similar history of 5 years' experience of the "Standard." In June, 1859, Dr. Christison gave a second history of the subsequent 5 years of the same Life Assurance Company. In 1860, Dr. Begbie published a Report of a second septennium of the "Scottish Widows' Fund." In March, 1862, Dr. J. G. M. Burt, following such excellent examples, published a "Report of the Causes of Death in the 'North British Life Assurance Company,' from the commencement up to 1860;" a period of 37 years. These Reports all appeared in the "Edinburgh Medical Journal."

From the commencement of the "British Empire Life Assurance Company," I have wished to gather the materials for such a Report of its first 10 years, which, after many unavoidable delays, is now accomplished. To this, however, I should hardly have attached so much value as to give it to the public in a separate volume; but by the kind and liberal courtesy of the three gentlemen I have named, Dr. Begbie, Dr. Christison, and Dr. Burt, I am permitted to make use of their valuable researches, which are therefore combined with the Report of our own Company, and now, for the first time, presented in such a compact form, as may make a ready book of reference to rather more than a 100 concurrent years of Life Assurance experience in Medical Statistics.

The distinctness of these several Reports has been preserved under each head, as it will serve to illustrate the varieties and oscillations which are found in these statistical researches. But it will be easy, from these data, to calculate the general average in relation to any class or section of these facts.

To the Medical Statistics I have added a second part, con-

sisting of Hints on the Selection of Lives. For these, also, I am largely indebted to my predecessors in this field, whom I have already named; and also to Dr. A. P. Stewart, of the "London and Yorkshire Assurance Company," who published some very valuable observations in 1851, which he has kindly placed at my service. I have also to thank my friend and colleague, Dr. E. H. Greenhow, for his experienced advice and aid. I would also refer to an excellent work by Dr. Fleming, of Glasgow, medical adviser to the "Scottish Amicable Life Assurance Company," containing an inquiry into the causes of death among its members from 1826 to 1860. This work is on a different plan from the present. As it is published in a separate form, it is within the reach of those who would study the subject from a somewhat different stand-point.

Some of those results which are exceptions to the general rule of the actuary, or which do not enter into his field of thought and calculation, but which are alluded to here as results of Medical Statistics, relate to.—

1. The value of female life at that period of life during which assurances are granted.
2. The variations that belong to particular classes according to their age, divided into different decennial periods,—varying also according to their status, or social position—according to their hereditary predisposition—according to their habits—and according to their employments.
3. The laws of Hereditary Disease.
4. The variations and oscillations of mortality in the different periods of the age of a Company.
5. The Correlations of Disease.
6. The separate influence of each Disease.

Much yet remains to be done. More deductions may be drawn from existing materials; and the materials them-

selves are still accumulating which may give us further light and progress, and serve to correct and improve those conclusions at which we have arrived, and which at present are put forth as suggestions, rather than as axioms.

It is hoped that other Offices will follow the example of the eminent Scottish Offices by which we have been guided; and, although the work of the medical adviser and assessor, must still be founded upon *observation* rather than upon *exact calculation*; we may hope to approach some stand-points that may render more harmonious, as well as more precise, the judgments of our medical officers throughout the country.

Instead of entering long notes at the foot of the page, I have preferred the collection of evidences and illustrations from other writers into an Appendix; to which I would direct the earnest attention of the reader. These notes will be comprehended in the Index.

Note A, gives an elaborate explanation of the general rule for avoiding Consumptive Risks, adopted in the "Scottish Widows' Fund," and in the "Standard." Note B, is on the important Correlations which exist between Phthisis and Malignant Disease. Note C, on the extent to which the age of the Company influences the ratio of the mortality from Phthisis in the annual returns. Note D, is on the average proportion of proposals that it will be found expedient to decline, as involving much more than average risks. These are from the pens of those able observers, and careful reasoners, Dr. Begbie and Dr. Christison.

Although I had no doubt in my own mind upon some points in which my conclusions differed from those of General Statistics; these being correct in their application to the general mass of the population, but incorrect in their relation to special groups in that mass; yet I was startled by the official confirmations of those conclusions in the Sixth Report of the

Medical Officer of the Privy Council, lately published. I particularly refer to the two following points, namely:—1. The greater severity with which Phthisis falls upon the industrial classes. 2. The existence of groups of female lives, in which the mortality is greatly in excess of the male lives, not of the general population only, but of the males of the same district. The conclusions of Actuaries are no doubt correct, as deduced from the vast mass of all ages, sexes, occupations, and localities, which forms the basis of their calculation. But it is a matter of grave importance to Life Assurance Companies to be more familiar with the waves which rise above, or which fall far below, this dead level of the ocean of life, for it is in these more stormy latitudes that the path of their voyage lies. Illustrations of the two points mentioned will be found in the notes E and F, from which it will appear that there are industrial occupations in which the mortality exceeds that of agricultural industry from 20 to 28 per cent. between the ages of 25 and 35; from 56 to 122 per cent. between the ages of 35 and 45; from 82 to 106 per cent. between the ages of 45 and 55. Now it is within these limits of 25 and 55 years of age that the vast majority of Life Proposals are made. In different localities, specified in the Report in question, the deaths from Phthisis, and other lung diseases, will be found in excess of the standard healthy districts, in a ratio, which at its *minimum*, is nearly two and a half times as many; and at its *maximum* eight times as many as the number in the more favoured localities.

With respect to the *greater frailty of female life* in some classes of the general population, the same Report gives statistical details of different places, in all of which it is largely in excess of male mortality, but in different proportions. But the average of the whole is an excess of mortality of 41 per cent. of the females. It must be remembered that these statements refer only to *adults*.

All these statistical results point to the importance of a more careful study; *first*, of the numerous variations in different classes from the general average expectancy of the community; second, of the causes and circumstances in various localities which greatly diminish the expectancy of life; originating often in special employments, and confined to particular classes, but always disposed to extend their deleterious influences beyond that special circle in which they originate. More especially should we keep in view those injurious results which may more or less descend to the next generation.

JOHN MANN.

4, Charterhouse Square, London,  
March 6, 1865.

# INDEX.

— 0 —

The numerals refer to the paragraph numbered, and not to the page.

	PARAGRAPH.
ABSCCESS . . . . .	17
Ague . . . . .	9
Aneurism . . . . .	65
Apoplexy . . . . .	27
Asthma . . . . .	45
„ Diagnosis from Phthisis in Family History . . . . .	186
„ Distinction of Hereditary from Acquired . . . . .	187
„ Prognosis of, in relation to Life Assurance, complex . . . . .	188
Atavism . . . . .	271, 272
Atrophy . . . . .	23
BLADDER, Disease of . . . . .	88
Bowels, Inflammation of . . . . .	15
„ Disease of . . . . .	79
Brain, Disease of . . . . .	38
Bronchitis . . . . .	40
CALCULUS of the Bladder . . . . .	86, 99
Cancer . . . . .	20
Carbuncle . . . . .	99
Cephalitis . . . . .	26

	PARAGRAPH.
Child-birth . . . . .	89
„ Per centage of Mortality in Life Assurance experience .	90
„ Causes of the increased Mortality from, in some classes of society . . . . .	91, 92
„ Mr. Robertson's opinions . . . . .	91
„ Dr. Collins's returns of Mortality from . . . . .	91A
„ Comparison of the Mortality from Childbirth with the Mortality of females from all other causes in Life Assurance experience . . . . .	93
„ Practical results of these enquiries . . . . .	94
„ Effect of excluding from Life Assurance all primipara .	95
Cholera . . . . .	6
Colic . . . . .	77
Commercial rivalry . . . . .	255
Consumption . . . . .	46
„ Ratio of Mortality from, unequal in the different classes of Society :—and in the different periods of an Assurance Company . . . . .	74
„ Also, see Appendix C. . . . .	Page 176
„ Hereditary . . . . .	49
„ Loss of years of expectancy in, as compared with the per centage of total Mortality . . . . .	52
„ Proportion of death cases which had been previously placed in the hazardous list . . . . .	53
„ Average survivancy . . . . .	54, 55
„ Average Mortality at different periods of life . . . . .	56
„ Wide range of its Prevalence . . . . .	56
„ Comparative ratios of Mortality from, in the different classes of Society . . . . .	57
„ Great prevalence of in Industrial Assurance . . . . .	58
„ Average duration of Medical Attendance in . . . . .	62
„ Also see under the head of Phthisis.	
Consumptive risks, Rule for Avoiding . . . . .	Appendix A., Page 167
Convulsions . . . . .	31
Corpulence, evil effects of . . . . .	155
Correlations of Disease . . . . .	129, 268
„ Their high importance in the study of Family History . . . . .	130, 269, 270
„ Primary and Secondary . . . . .	131
„ Observation of the, by Dr. C. H. Parry, at the beginning of the present century . . . . .	132
„ Illustrations of . . . . .	133, 134
„ Momentous influence of these Metamor- phoses of Disease . . . . .	135

	PARAGRAPH.
Correlations of Phthisis with Struma, and Malignant Disease	
Appendix B., Page 173	
Coup d'œil of the elements which should enter into the investigation	
of the value of each life . . . . .	277—286
Cystitis . . . . .	85
Death, Sudden . . . . .	25
Deaths, from causes not specified . . . . .	104
Debility . . . . .	24
Defects of Description in Life Proposals . . . . .	266
Delirium Tremens . . . . .	36
„ Age of principal liability to . . . . .	37
Diabetes . . . . .	84
Diarrhæa . . . . .	3
Dropsy . . . . .	16, 204
Dysentery . . . . .	4
EARLY emerging Risks . . . . .	126
Enteritis . . . . .	71
Epilepsy . . . . .	33
„ Influence of Temperance upon . . . . .	34
„ Evidence of the Patient not always reliable . . . . .	207
„ Characteristics of some of the Epileptic Class . . . . .	208
„ Milder may pass into the Severer forms . . . . .	209
„ Should be studied in connection with the Family History . . . . .	211
Erysipelas . . . . .	12
Evasive modes of describing Phthisis . . . . .	263
FAMILY HISTORY, its great importance . . . . .	116
„ Analysis of sixty-seven Family Histories . . . . .	117
„ Facts of, thus disclosed . . . . .	118
„ Frequently the sole basis of prevision . . . . .	119
„ Early deaths in, suspicious . . . . .	125
Fever, Continued . . . . .	11
„ Remittent . . . . .	10
Female Lives, risk of, much greater than in the other sex during	
that period of life at which proposals are usually made . . . . .	170
Also, see Appendix F. . . . .	Page 185
GOUT . . . . .	22
„ Its immediate influence on Mortality, Feeble . . . . .	192
„ Immense importance of its remote, indirect, or correlative	
influences . . . . .	193, 194
„ And Longevity . . . . .	195

	PARAGRAPH
Gout, This Longevity not Hereditary . . . . .	196
„ Prognosis in, complex . . . . .	197
„ The <i>morale</i> in . . . . .	198
Gastritis . . . . .	72
HEART, Diseases of . . . . .	66
„ „ Their distribution over different periods of life . . . . .	67
„ „ Frequent absence of the general symptoms . . . . .	69
„ „ Hold an important relation to the Risk of Life Assurance . . . . .	216
„ „ Physical signs of Disease in, Definite and Precise . . . . .	217
„ „ General signs, often ambiguous and obscure . . . . .	218
„ „ Connexion with Rheumatism . . . . .	220
„ „ Dr. Begbie's testimony as to the degree of frequency . . . . .	220, 221
„ „ Dr. Christison's judgment of these cases . . . . .	220
„ „ Dr. Burt's statements of their average duration and average expectation . . . . .	223
„ „ Diseases of, Table of mortality form at Decennial Periods of life . . . . .	222
„ „ Ratio increases as the Members of a Life Assurance Company advances in ages . . . . .	224
Hæmatemesis . . . . .	78
Hæmoptysis . . . . .	171, 172, 173
Hemorrhage . . . . .	14
Hemorrhoids . . . . .	200
Hepatitis . . . . .	80
Hereditary Disease, its greater tendency to descend in the same sex as that of the diseased parent . . . . .	121
„ <i>degree</i> of this preference of the same line of sex . . . . .	122
„ Parallel in Hereditary Proclivity between cases of Insanity and Consumption . . . . .	123
Heredity, in its relations to Marriage . . . . .	124
„ affects Moral as well as Physical Characteristics . . . . .	127
Hernia . . . . .	76
Hydrophobia . . . . .	13
Hydro-thorax . . . . .	44
INEQUALITY of Pulmonary Death-rates, in different localities . . . . .	See Appendix E (a) Page 185
Influenza. . . . .	8
Insanity . . . . .	35
„ Inefficiency of the forfeiture clause to protect Life Offices in cases of Suicide, from . . . . .	214

	PARAGRAPH,
Insanity, Other important risks besides that of Suicide, connected with . . . . .	215
„ Indirect consequences of . . . . .	102
Ischuria . . . . .	83
JAUNDICE . . . . .	81
Joints, Disease of . . . . .	98
KIDNEYS, Disease of . . . . .	87
LARYNGITIS . . . . .	39
Life Assurance Experience, for a Hundred Years . . . . .	112
„ Calculations for Classes, not for Individuals . . . . .	113
„ Facts, Divisible into Four Classes . . . . .	115
Liver, Disease of . . . . .	82
Longevity, not always Hereditary . . . . .	261
Lungs, Disease of . . . . .	63
MISLEADING Statements . . . . .	259
Mortification . . . . .	18
Myelitis . . . . .	30
NEGLECT of the Correlations of Disease . . . . .	267
OBJECTIONS to the Assurance of the Lives of Wives . . . . .	226
„ High Mortality of this section of the Industrial Lives . . . . .	227
„ Relative proportion of the Sickness of Males and Females, in the Industrial Classes . . . . .	228
„ Necessity, in order to meet this, for raising the Subscription for Female Lives . . . . .	229
„ Occasional Predominance of Female over Male Mortality . . . . . See Appendix F., Page 186	
Occupations, Two grand classes, in Relation to Health . . . . .	225
„ Injurious . . . . .	231
„ „ Acting through, or upon the Organs of Respiration . . . . . 232, 233, 234, 235, 236, 237, 238, 239, 240	
„ „ Acting through, or upon, the Organs of Digestion . . . . . 241, 242, 243, 244	
„ „ Acting through, or upon, the skin . . . . . 245, 247, 248, 249	
„ By restraining the position of the Body . . . . . 250, 251	

	PARAGRAPH.
Occupations, Injurious, By their Moral Associations . . . . .	252
"    "    The <i>bon vivant</i> . . . . .	253
"    "    By interfering with Sleep . . . . .	254
Old Age . . . . .	103
PARALYSIS . . . . .	28
"    Deaths from, increase in number as a Company increases in Age . . . . .	29
Paraplegia . . . . .	30
Partial Statements . . . . .	260
Pericarditis . . . . .	64
Peritonitis . . . . .	73
Perforation . . . . .	74
Personal History . . . . .	130
"    Age . . . . .	136
"    Arcus senilis . . . . .	137
"    Climacteric Periods . . . . .	138
"    Dangerous Periods . . . . .	139
"    Countenance . . . . .	140
"    Complexion . . . . .	141
"    Temperance . . . . .	143
"    Loss of Expectancy in the Intemperate . . . . .	144
"    Social status . . . . .	145
"    Symmetry . . . . .	146
"    Habits . . . . .	147
"    "    Of Carelessness . . . . .	150
"    Previous Diseases in . . . . .	166
"    Hæmoptysis . . . . .	167
"    "    Sometimes precedes Phthisis by several years . . . . .	168
"    "    Table of the relations of, to the several decennial periods of life . . . . .	169
"    Moral, as well as Physical conditions to be con- sidered . . . . .	189
"    Physical aspects . . . . .	190
Phthisis, an Early Emerging risk . . . . .	108
"    Its occasional relation to extraordinary muscular power and endurance . . . . .	120
"    Great liability of the Industrial Classes to this form of Disease . . . . .	128
"    Its connexion with Hæmoptysis . . . . .	171, 172
"    Its connexion with Hæmoptysis, Illustrated . . . . .	173

	PARAGRAPH.
Phthisis, Its connexion with Hæmoptysis, Apparent escape from this connexion, often delusive . . . . .	174
„ Opinion of Dr. Ward . . . . .	175
„ Experience of Dr. Fleming . . . . .	176
„ Opinion of Dr. Brinton . . . . .	177
„ Its preponderating prevalence in the Industrial Classes. See Appendix E. . . . .	Page 181
Pleurisy . . . . .	41, 202
„ Its connexion with Rheumatism . . . . .	203
Pneumonia . . . . .	42
„ Variations in the Mortality from . . . . .	43
Position, restrained, effects of . . . . .	250, 251
Practical Deductions, as to the proportion of Life Proposals to be declined See Appendix D. . . . .	Page 177
RATIO of Mortality . . . . .	106
„ Oscillations of . . . . .	107
„ Variations of from undiscovered causes . . . . .	109
„ Disturbing agencies in the . . . . .	111
„ Researches of Dr. Greenhow . . . . .	111
Relations of Stature and Weight . . . . .	151
„ Between a Life Assurance Company and its Medical Advisers . . . . .	275, 276
Resumé of Causes of Death . . . . .	105
Rheumatism . . . . .	97, 179
„ Its study should be comprehensive . . . . .	180
„ Correlations of . . . . .	181
„ Sequelæ . . . . .	182, 183
„ Its Hereditary character . . . . .	186
SCARLATINA . . . . .	2
Scrofula . . . . .	19
Smoking . . . . .	148, 243, 244
Stomach, Disease of . . . . .	79
Stomatitis . . . . .	70
Suicide . . . . .	101
Suggestio Falsi . . . . .	258
Suppressio Veri . . . . .	257, 265
Surcharges . . . . .	273
„ Explanation of . . . . .	274
TETANUS . . . . .	32
Tumor . . . . .	21

	PARAGRAPH.
ULCERATION of the Bowels . . . . .	74
Ulcers . . . . .	201
Uterus, Disease of . . . . .	96
VARIOLA . . . . .	1
Violent Death . . . . .	100
WEIGHT, Loss of . . . . .	152
"    Its various indications . . . . .	152, 154
"    Table of the Limits within which it may vary . . . . .	153



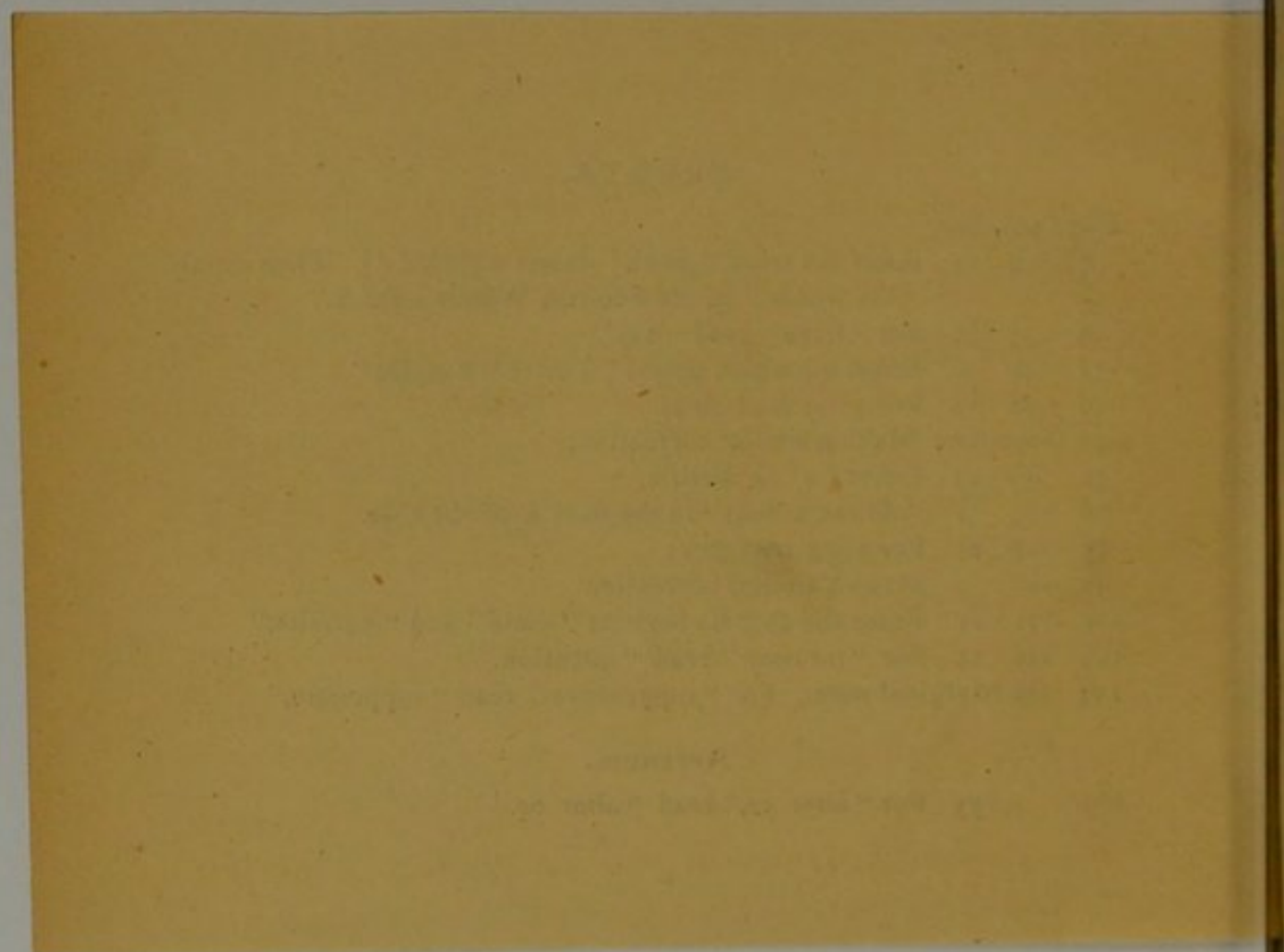
## ERRATA.

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- |     |           |                |   |
|-----|-----------|----------------|---|
| 7   | 9         | 15             | After the word "death" insert a period (.). Then supply the words "In the Scottish Widow's Fund." |
| 26  | 35        | 32             | For "have" read "has."  |
| 32  | 41        | 6              | Insert quotation points (") after "Empire."   |
| 40  | 52        | 11             | For 77'25 read 30'41.   |
| 40  | Foot-note |                | Make a similar correction.  |
| 57  | 80        | 24             | Insert "s" in Briti h.  |
| 78  | 105       | 1              | Add the accent ' to the final E of the title.   |
| 85  | 118       | 27             | For 77'25 read 30'41  |
| 90  | 127       | 3              | Make a similar correction.  |
| 109 | 171       | 23             | Erase the comma betwixt "santé" and "parfaite."   |
| 149 | 256       | 14             | For "infusion" read "intrusion."  |
| 149 | 256       | Marginal note. | For "suppressive" read "suppressio."  |

## APPENDIX.

- |     |    |                                  |
|-----|----|----------------------------------|
| 169 | 33 | For "after 50," read "after 60." |
|-----|----|----------------------------------|



## MEDICAL STATISTICS.

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### *Report on the Medical Statistics of the First Ten Years of the "British Empire Mutual Life Assurance Company."*

IN the classification of the causes of death given in the following report, I have followed that adopted by Dr. Begbie, which was founded on the Statistical Nosology originally issued from the office of the Registrar-General in 1838, and which is nearly the same as that employed by Dr. Christison in his report relative to the "Standard," and also substantially identical with the report of Dr. J. G. M. Burt, in his history of the causes of death in the "North British Insurance Company."

The Registrar-General has now adopted a Nosology which is scientifically more perfect, founded on the recommendations of the Statistical Congress in Brussels. This was constructed by Dr. Farr in 1856, and was subsequent to the publication of the first reports of Dr. Begbie and Dr. Christison. It would have involved considerable labour without any adequate compensation to have altered all the arrangements of these valuable documents in conformity

with the new classification. Moreover, the original arrangement is more intelligible, and more readily applicable to the immediate object: namely, that of furnishing a practical and useful statement of the Medical Statistics of Life Assurance.

In accordance then with this scheme, the causes of death are distributed into the following classes;—namely,

Class 1. Epidemic and Contagious Diseases.

Class 2. Diseases of uncertain seat.

Class 3. Diseases of the Brain and Nerves.

Class 4. Diseases of the Respiratory Organs.

Class 5. Diseases of the Heart and Blood-vessels.

Class 6. Diseases of the Organs of Digestion.

Class 7. Diseases of the Urinary Organs.

Class 8. Child-birth, and Diseases of the Uterus.

Class 9. Diseases of the Joints.

Class 10. Violent Deaths.

Class 11. Old Age.

Class 12. Causes not specified, nor ascertained.

# I. EPIDEMIC AND CONTAGIOUS DISEASES.

I  
Variola.

1. *Variola*. From this the “British Empire” has had two deaths. The first occurred at the age of 27. The duration was six days. It was confluent, and terminated with pneumonia. The second case was that of a male at 33. The duration of medical attendance was 7 days. It occurred after successful vaccination in infancy. The average loss of years of expectancy on these two cases was 32.39 years.

In the first 37 years experience of the “Scottish Widow’s Fund,” namely, from 1815 to 1852, no

death occurred from Small Pox; but in the last seven years (1852 to 1859) four have happened. In the experience of the "Standard," from 1845 to 1850, two happened, and the same number in the five years from 1850 to 1855. These differences are probably explained by the greater prevalence of Small Pox in the community during the last ten or fourteen years as compared with the preceding half-century. No case of death from Variola seems to have occurred within the first 37 years of the "North British Insurance Company" (1823 to 1860.)

2. *Scarlatina*. Two fatal cases have occurred. 2  
Scarlatina  
The first was in a male at the age of 36. The duration was twenty days. This seems to have been a very mild form of the disease, which was rendered fatal by its combination with Phthisis. The second case also occurred in a male at the age of 48 years. It was fatal in 4 days. It was the malignant form of the disease; and, perhaps, the age of the patient, nearly 50, increased the risk. For although as age advances the body becomes less susceptible of the contagious influence, yet if once attacked, it more readily succumbs, than at the earlier periods of life. The average loss of years of expectancy, was 23.87 years.

Within the first 37 years of the "Scottish Widows' Fund" (1815 to 1852) five deaths from *Scarlatina* appeared. Four between 30 and 40 years of age; one between 50 and 60. In the following 7 years (1853 to 1860) occurred five deaths; one between 20 and 30 years of age; four between 40 and 50.

In the "North British" during the first 37 years

(1823 to 1860) five deaths occurred from Scarlatina. The average duration of life after Assurance was 6 years 10 months. The average expectation

3 38.73.\*  
Diarrhœa 3. *Diarrhœa.* Only three cases are classed under this head. The ages were 41, 50, and 65 years. All were males. One happened in July, 1848, when Cholera was in some places epidemic. One had suffered from Dysentery twelve months before. During the first 37 years of the experience of the "Scottish Widows' Fund" only seven deaths are recorded from this disease (1815 to 1852). During the last 7 years there occurred seven (1852 to 1859). The mortality from this cause thus appears to vary considerably among the class of lives which are insured: but the per centage ratio, taken on the sum of the deaths is never very considerable. (1.15 per cent. in the first 10 years of the "British Empire," and only .525 per cent. in the first 37 years of the "Scottish Widows' Fund," which in the 7 years, from 1852 to 1859, rises to .716 per cent.) In the returns of the "North British" by Dr. J. G. M. Burt, during 37 years (1823 to 1860) the deaths from Diarrhœa were twenty. The average duration of life after Assurance was 12 years. The average expectation, 22.88. The average per centage of total mortality, 1.53.

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\* N.B. The phrase "Average duration" means, the average time each person lived after assurance. "Average expectation or expectancy," the time each ought to have lived according to the calculated average. "Average loss of years of expectancy," the period unfulfilled of that average when death took place.

4. *Dysentery*. Three cases of death have happened from this cause, two male and one female, at the respective ages of 30, 32, and 44. Only one of these occurred in England; one in Australia; one on board ship, having previously caught the disease at Demerara. 21 cases are reported in the first 37 years of the "Scottish Widows' Fund," of which three occurred between 20 and 30 years of age; one between 30 and 40; four between 40 and 50; three between 50 and 60; seven between 60 and 70; two between 70 and 80; and one at 80. In the 7 subsequent years (1852 to 1859) ten cases have occurred, which is an increased proportion.

In the tables of Dr. Christison no distinct report is given of Diarrhœa and Dysentery; these are classed together giving a mortality of eleven for the first Quinquennium (1845 to 1850), and of twelve for the second (1850 to 1855). In the report of the "North British" during 37 years, we find sixteen cases of Dysentery. The average duration of life after Assurance was 11 years, 11 months. The average expectation, 24.96. The per centage of total mortality, 1.22.

5. *Cholera*. We have to report thirteen deaths from Cholera. Yet the experience of the Society includes not only one great epidemic visitation of this scourge, but a second of smaller proportions. Only two of these deaths were females. Of the total number two occurred between 20 and 30 years of age; two between 30 and 40; four between 40 and 50; three between 50 and 60; and two between 60 and 70.

- 7 In the "Scottish Widows' Fund" the mortality from malignant Cholera in the Septennium, from 1846 to 1852, was twenty-seven; in the second Septennium, from 1852 to 1859, it had decreased to seventeen. In the history of the "Standard" the Quinquennium from 1845 to 1850, presents twenty deaths; in the next Quinquennium, from 1850 to 1855, the return sinks to six only.

In the "North British Insurance" the 37 years (1823 to 1860) present only sixteen cases of Cholera. The average duration of life after Assurance was 8 years, 6 months. The average expectation 26.74. The percentage of total mortality 1.22. This varies considerably according as the period taken may include one or more epidemic years; thus in the experience of

The British Empire Life Assurance	it is 5.06 nearly	1847 to 57	10 years
The Scottish Widows' Fund	3.91	1845	52 7
Ditto	1.47	1852	59 7
Ditto	2.11	1815	59 44

The percentage of total mortality in the case of the "British Empire Life Company" is the highest because the Decennium happened to include two Cholera epidemics, one in 1849; another in 1854.

- 8 Influenza 6. *Influenza*. In the experience of the "British Empire" only one death from this cause is recorded, which occurred to a female at the age of 61. It was fatal in sixteen hours, and occurred in October, 1855.

In the "Scottish Widows' Fund" the mortality from Influenza was eight in the Septennium from 1845 to 1852; and six in the following 7 years from 1852 to 1859. In the period of 30 years from 1815 to 1845, only eleven deaths from Influenza are registered.

The "North British" in 37 years (1823 to 1860) reports fifteen deaths from Influenza. The average duration of each life after Assurance was 10 years 6 months. The average expectancy 24.82. The percentage of total mortality 1.15.

In the report of the "Standard" Influenza and Bronchitis have been classed together.

7. *Ague*. No case has occurred in the "British Empire Life Office." In the "Scottish Widows Fund" only one case happened in a period of 37 years, from 1815 to 1852. It is not mentioned by Dr. Christison in his reports of the "Standard." Only one case of death from Ague has occurred to the "North British."

8. *Remittent Fever*. The "British Empire" has had no case of death three cases occurred in a period of 37 years, from 1815, while in the last 7 years no case has happened. This form of disease is not noticed by Dr. Christison. But he introduces two other classes, namely, Gastric, and Tropical Fevers, the latter including Yellow and Remittent. One case of Gastric Fever occurred in the first period of 5 years, from 1845 to 1850; and seven in the second period (1850 to 1855). Of Tropical Fevers one in the first period, and three in the second. Of Remittent Fever, the "North British" reports eight deaths in 37 years, (1823 to 1860). The average duration of each life after Assurance was 6 years, 1 month. The average expectation 30.07. The percentage of total mortality .61.

9. *Continued Fever*. This includes Typhus, Typhoid, and all the other forms, which having no marked remissions come under this class. The "British Empire" numbers nineteen deaths from this

cause. Eight (six males and two females) died between 20 and 30; five (males) between 30 and 40; three between 40 and 50 (two males and one female); three (males) between 50 and 60.

The average duration of the medical attendance in these cases of fever was sixteen and-a-quarter days. Only one exceeded thirty days; four only exceeded twenty-one.

In this small group of fatal Fever cases may be observed the prevalence of one feature, which distinguishes these forms of disease; namely, the greater susceptibility to Fever poison of those who are in the prime of youth, or who seem to be at the acme of human health and strength.

In 117 cases of Continued Fever occurring in 37 years (1815 to 1852) of the "Scottish Widows' Fund," sixty-one, or more than half happened between 30 and 50. The general proportion to the whole number of deaths was about 8 per cent. This is nearly the same as in the first 10 years of the "British Empire," which is 7.3 per cent. In the last 7 years of the "Scottish Widows' Fund" it has diminished to 5 per cent.

Fever is a serious source of loss to Assurance Companies not only by the number but the quality of the lives it destroys, the larger proportion of which are healthy, robust, youthful, and who but for this mischance might, probably, have attained more than the average period of human life.

In the report of the "Standard" for the first Quinquennium (1845 to 1850) Dr. Christison gives thirty-seven cases of Typhus and one of Gastric

Fever. In the second Quinquennium (1850 to 1855) thirty of Typhus and seven of Gastric, or 23.5 per cent of the total mortality in the first period, and 12.8 in the second.

The "North British" reports ninety-four deaths from Continued Fever within 37 years (1823 to 1860). The average duration of each policy was 8 years 6 months from the time of Assurance; and the average expectation 28.66. The per centage of total mortality 7.21.

Dr. Burt notes the professions and occupations of those who were the victims of Fever.

Merchants and Shop-keepers	. . . . .	16
Clergymen . . . . .	. . . . .	4
Military Officers . . . . .	. . . . .	4
Farmers . . . . .	. . . . .	6
Inn keepers . . . . .	. . . . .	4
No profession . . . . .	. . . . .	10
Females . . . . .	. . . . .	6

The remainder were spread over a variety of occupations.

Although Fever cannot be classed among hereditary diseases, yet in some families a more than ordinary susceptibility to this disease appears to be inherited. Thus in one case which survived the attack only 14 days, and which occurred at 32 years of age, the mother died at 37 of Fever; and the father died abroad of the same disease at 35. It will be noticed that these deaths were not only at different dates, but at different places; and therefore originating in separate and distinct causes, or contagions.

9. *Erysipelas*. The "British Empire" has not had <sup>12</sup> *Erysipelas*

any death from this disease. Within the first 37 years of the "Scottish Widows' Fund," ending 1852, eighteen deaths from Erysipelas are recorded. These were distributed over every successive Decenniad of life; the maximum number occurring between 40 and 60. The last 7 years (1852 to 1859) have added nine more to the previous eighteen, making twenty-seven deaths in the period of 44 years.

In the first 5 years of the "Standard" reported by Dr. Christison (1845 to 1850) six deaths; and in the latter 5 years, from 1850 to 1855, only three, occurred from Erysipelas.

In the report of the "North British" Dr. Burt gives twelve cases of deaths from Erysipelas in the course of 37 years, from 1833 to 1860. The average duration of life after Assurance in these cases was 8 years. The average expectation 22.85 years. The per centage on the total mortality .92.

<sup>13</sup>  
Hydro-  
phobia

10. *Hydrophobia*. This has been introduced by Dr. Begbie; one case having occurred within the last 7 years (1852 to 1859), of the "Scottish Widows' Fund."

## CLASS II.—DISEASES OF UNCERTAIN SEAT

<sup>14</sup>  
Hemorr-  
hage

1. *Hemorrhage*. Only one case has occurred to our Company. This was a young man of 27, who was a hair-dresser. He was under medical care five days. No history of details is given.

Only six cases are recorded in the first 37 years (1815 to 1852), of the "Scottish Widows' Fund." No one within the next 7 years.

In the deaths of the "Standard," Dr. Christison reports two from Hemorrhage in the first period of 5 years; but none in the second period of like duration.

The "North British" in a period of 37 years (1823 to 1860) gives a mortality from Hemorrhage of fifteen. The average duration of each life after Assurance was 8 years, 2 months. The average expectation 26.31 years. The per centage on total mortality 1.15.

Under this second Class of Diseases, after Hemor-<sup>15</sup>rhage, Dr. Burt has a section under the head of <sup>Inflam-</sup>mation. This section was not admitted into Dr. Begbie's first and second reports, and in the third, there occur only two cases. One between the age of 40 and 50, and another between 60 and 70. This vague and indefinite description of the cause of death very often occurs in family histories, accompanying the Life Proposals which are brought to our office; but it now rarely occurs in the returns made by qualified medical men.

Under this title of Inflammation there appear in the report of the "North British" fifteen deaths during 37 years. In these the average duration of life after Assurance was only 6 years 5 days. The average expectation was 28.29. The per centage on total mortality, .84.

2. *Dropsy*. In strict propriety this should generally <sup>16</sup>be regarded as a symptom of some other disease, <sup>Dropsy</sup>rather than as a disease *per se*. But still there remain a few cases in which this form of disease is idiopathic, or constitutional, and not traceable to any local organic affection.

In our first 10 years only four cases of Dropsy have happened. Three of these were between 30 and 40 years of age; and one at 52; of this one we have hardly any information. He was a pilot by occupation, which involved exposure, anxiety, and, perhaps, some degree of intemperance. The second died in Australia. The third suffered from Atrophy 2 years, which then terminated in Ascites. The fourth is said to have suffered from Anemia 8 weeks, and from Congestion of the Lungs and Anasarca 2 weeks.

In the first 37 years of the "Scottish Widows' Fund" we find thirteen cases of dropsy, of which eight occurred between 40 and 60 years of age. The two last septennial periods give four to each, a considerably diminished proportion, arising perhaps in part from more correct returns, in which dropsy has been included only as a symptom of Kidney or Heart disease.

In the first quinquennial return of the "Standard" we have ten deaths from dropsy; in the latter only three. This remarkable difference must be ascribed to the cause just mentioned.

In 37 years' experience (1823—60) of the "North British" there happened forty-six cases of death from dropsy. The average duration of life after Assurance was 8 years 7 months. The average expectation 21.89 years. The per centage on total mortality, 3.53.

<sup>17</sup>  
Abscess

3. *Abscess.* Of deaths from this cause the "British Empire" has only two. One was of a married female, 28 years of age; the seat of the disease was the neck, but there are no further details. The other was an engineer, 40 years of age; the Abscess occurred in the spleen, as a consequence of Dysentery. The duration of medical attendance was 29 days.

In the "Scottish Widows' Fund" the first period of 37 years includes only two cases of death from Abscess; one of which happened between 40 and 50 years of age, and one between 70 and 80. In the last 7 years (1852—59) three have fallen.

Abscess appears as the cause of eleven deaths in the 37 years' experience (1823—60) of the "North British Insurance Company." The average duration after Assurance was 11 years 4 months. The average expectation 26.63. The per centage on total mortality .84.

4. *Mortification*. Of this the "British Empire" has <sup>18</sup> only one case, somewhat resembling the *gangrena* <sup>Mortifica-</sup> <sup>tion</sup> *senilis* of old age, yet it occurred so early in life as 39. The Assurer was a butler, of healthy parents, both of whom were living at the ages of 86 and 80 years, at the time of his acceptance. The seat of the disease was the lower extremity. It was accompanied with fatty disease of the liver. The suspicion arises that the habits of life connected with his occupation had a large influence in making the length of this man's life so different from the lives of his parents.

Only one case of this kind appears in the first quinquennial period of the "Standard" returns by Dr. Christison.

Eleven cases are recorded in the first 37 years of the "Scottish Widows' Fund."

Twelve deaths from Mortification are related in the 37 years (1823—60) of the "North British." The average duration of each after Assurance was 16 years 8 months. The average expectation 20.86. The per centage on total mortality .92.

19  
Scrofula

5. *Scrofula*. One death from this cachexia is mentioned in the last report of the "Scottish Widows' Fund." No case has been returned to the "British Empire" as a death from Scrofula: although no doubt many have arisen in connexion with the Scrofulous Diathesis. Scrofula is not mentioned in the Reports of the "Standard" and the "North British" Insurance Companies. This is notwithstanding, the parent disease of others more numerous than those which arise from any other constitutional taint; but in that form of disease which commonly bears the name of Scrofula, namely, Ulcerative affections of the skin and absorbent glands, it is rarely fatal.

20  
Cancer

6. *Cancer*. Of this, 14 cases have occurred in the "British Empire," or nearly  $5\frac{1}{2}$  per cent, which is a large proportion.\* Eleven of these were males, and three females. One took place at the age of 27, in a locksmith, but the seat is not stated. One between 30 and 40; five between 50 and 60; two between 60 and 70.

As to the seat of the disease. In three cases it was the uterus. In three it was abdominal, affecting the liver, or the liver and stomach. In one it occurred in the Larynx, producing death from Asphyxia. In one, Schirrhous of the neck was associated with Cancer of the stomach. One was Schirrhous of the Pylorus. One Encephaloid Disease of the Lungs, Liver, and Pancreas. One Schirrhous of the Rectum. In two the seat was not stated.

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\* The deaths from cancer of the whole population of England and Wales in 1853 were 5,663, or about 1-73rd of the total mortality. This, however, is no fair comparison, as the return includes all the mortality up to 30 years of age, below which death from Cancer rarely occurs.

Cancer is often an hereditary disease. In nine of these the family history was doubtful or imperfect, and the disease might have been inherited, but there was no positive proof of hereditary taint in any one.

The "Scottish Widows' Fund" during its first period of 37 years (1815 to 1852) presents eleven deaths from cancer. One between 20 and 30 years of age. Two between 40 and 50. Four between 50 and 60. Five between 60 and 70. The last return of 7 years gives twenty-eight cases,\* indicating perhaps a more correct diagnosis of disease than formerly, when many cases of this class were returned under the indefinite name of Disease of the Stomach or Liver.

Few cases of this order seem to have fallen within the experience of the "Standard." Cancer in their returns is comprehended under the head of malignant diseases; of which class three only are registered within the first five years, and five in the second quinquennial period.

The experience of the "North British," in 37 years (1823-60) shows twenty-five deaths from Cancer. The average duration of life after Assurance was 12 years 7 months. The average expectation, 22 years. The percentage on total mortality, 1.91.

7. *Tumor*. Of this class the "British Empire" has <sup>21</sup> only one instance. It occurred in a female of 55 years of age. Its seat was the breast. The period of medical attendance was only 6 months. As it is styled *malignant*, it probably belonged to the family of Cancer, and might have been included under that head. Tumor

\* About 1-25th, or nearly  $\frac{1}{4}$  per cent. of the whole mortality.

The "Scottish Widows' Fund," in its period of 37 years (1815 to 1852), includes twelve cases of death from Tumor. Of these, two happened between 30 and 40 years of age. One between 40 and 50. Four between 50 and 60. Two between 60 and 70. Three between 70 and 80. Only three cases of death from Tumor are recorded in the last 7 years (1853-9).

In the returns of the "Standard," this section has not been adopted; deaths from Tumor being included under other heads.

In the returns of the "North British," for 37 years (1823-60) four deaths are set down as arising from Tumor. In these the average duration of life after acceptance was 13 years 5 months. The average expectation was 27 years. The percentage of total mortality was .30.

22 Gout 8. *Gout*. We have no case in our returns of death from this cause. No doubt it has been connected indirectly, with many fatal cases which sprung from, or were aggravated by, the gouty constitution.

Only three deaths from Gout are recorded in the 37 years of the "Scottish Widows' Fund" (1815 to 1852). Of these one fell between 50 and 60; one between 60 and 70; and one between 70 and 80. Four are recorded in the last Septennial period (1853 to 1859), of which two occurred between 50 and 60, and two between 60 and 70.

In the reports of the "Standard" no death from Gout appears in the first period of five years, and only one in the second. Dr. Christison pertinently adds:—"But it must not be supposed that the gouty constitution is thereby proved 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."

Six cases of death from Gout are mentioned in the report of the "North British" 37 years (1823-60). Of these the average duration after acceptance was 8 years 1 month. The average expectation was 19.11. The per centage on total mortality, .46.

9. *Atrophy*. We have only one death ascribed to this cause. Like Dropsy, it is generally to be regarded only as a symptom. In this case it was supposed to arise from chronic disease of the Liver. The age of the Insurer was 49, and his occupation that of foreman at the scribbling engines. Medical attendance was given for 1 month and 9 days. His parents both reached a fair age; his father dying at 60 of apoplexy, and his mother at 71, of what disease was not known.

Within the 37 years of the "Scottish Widows' Fund" (1815 to 1852), seven deaths are attributed to Atrophy. One of these occurred between 20 and 30; two between 30 and 40; one between 40 and 50; one between 50 and 60; one between 60 and 70; and one at 80. In the next seven years three are attributed to this cause. One between 20 and 30; one between 30 and 40; and one between 70 and 80.

Atrophy is not mentioned in the list of causes of death made by the "Standard," probably most of the cases so called should be classed with some form of Phthisis.

Accordingly, in the table of the "North British," *Atrophy* appears in the class assigned to Tubercular diseases; and to it eight deaths are ascribed in 37

years (1823 to 1860). Of these, the average duration after Assurance was 16 years 7 months. The average expectation 27.92. The per centage on total mortality .61.

24  
Debility

10. *Debility*. Of this unsatisfactory designation of a cause of death, the "British Empire" has only one instance, which happened to a fire-surveyor, 56 years of age. His father died at 60 of Jaundice, whilst his mother reached the advanced age of 81.

Seventeen deaths are returned under this head within the period of 37 years (1815 to 1852) of the "Scottish Widows' Fund." Two between 30 and 40; two between 40 and 50; two between 50 and 60; nine between 60 and 70; and three between 70 and 80. Within the next seven years (1853-9) no death was entered under this head.

Debility is not mentioned as a cause of death by either Dr. Christison or Dr. Burt.

25  
Sudden  
Death

11. *Sudden Death*. Of this two cases only are reported, one at 54, the other at 29 years of age. In neither were any details given which throw any light on the cause of death. The younger of the two died in Australia.

In the "Scottish Widows' Fund" ten cases of sudden death occurred during the 37 years (1815 to 1852). Three between 30 and 40 years of age. Three between 40 and 50; one between 50 and 60; one between 60 and 70, and two between 70 and 80. During the 7 years (1853-9) five sudden deaths fell in. One between 30 and 40; two between 50 and 60; one between 60 and 70; one between 70 and 80.

Sudden death is also omitted from the list of causes

of death in the reports of the "Standard," and of the "North British." Probably it is included under the classes which contain the diseases of the Heart or the Brain.

CLASS III.—DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

1. *Cephalitis*. This designation properly includes <sup>26</sup> all cases of inflammation within the cranium: whether *Cephalitis* of the brain, or of its membranes: single or conjoined. Only one case falls under this head in the "British Empire." The details are imperfect. The period of medical attendance was 17 days. The age at death was only 27. The father of this insurer died at an early age, but we have no precise statement either of his age or of his disease. It is worthy of remark that the insurer was deaf at the time of examination, which was only two years before his death. The industrious, laborious, and accurate data accumulated by Mr. Toynbee in his investigations of this subject, show that a large proportion of these cases of *Cephalitis* originate in disease of the *meatus auditorius*, which passes gradually inwards, involving successively the temporal bone, *dura mater*, and the brain itself.

Thirty-two cases of *Cephalitis* appear in the 37 years of the "Scottish Widows' Fund" (1815 to 1852). Of these two occurred between 20 and 30 years of age. Five between 30 and 40; twelve between 40 and 50; seven between 50 and 60; six between 60 and 70. Within the last Septennial period (1853-9) nine more cases of *Cephalitis* have happened.

One between 30 and 40; four between 40 and 50; and four between 50 and 60.

In the "North British" fifteen cases of death are referred to Cephalitis. Of these the average duration was 7 years and 6 months. The average expectancy 29.63. The per centage on total mortality 1.15.

<sup>27</sup>  
Apoplexy 2. *Apoplexy.* Ten of our deaths in the "British Empire" are attributed to this disease. Of these, one took place between 20 and 30; one between 30 and 40; five between 40 and 50; two between 60 and 70; one between 70 and 80. Three of these, probably, were hereditary, and four doubtful. It is popularly believed that this disease runs in some families; and this belief accords with medical observation. It is worthy of remark that only three of the whole (3-10ths) occurred after the age of 50. So that Apoplexy, in our history, has by no means a title to be considered *the* disease of old age. Only two of the ten were females; one of whom died nearly at the same age as her father, and probably of the same disease. One (a male) died in a lunatic asylum.

One hundred and five cases of Apoplexy occurred in the 37 years of the "Scottish Widows' Fund" (1815 to 1852). Of these, two happened between 20 and 30; six between 30 and 40; twenty-two between 40 and 50; twenty-five between 50 and 60; thirty-seven between 60 and 70; eleven between 70 and 80; two at 80 and upwards. In this history, thirty of the cases only occurred before 50, and seventy-five afterwards.

The 7 years following (1853-9) gives sixty-seven cases, which is an increase of thirteen on the preceding 7 years. Of these fifty-three occurred after the age

of 50. The details are as follows, namely:—One between 20 and 30; 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; three after 80.

In the "Standard" forty-one cases occurred in the first period of five years (1845-50), and forty-five in the second (1850-1855). Dr. Christison observes that this is a slight increase. Cases of Paralysis are in the lists of the "Standard," included under this head.

Dr. Burt returns one hundred and five cases of death under the head of Apoplexy in 37 years of the "North British" (1823-60). Of these, the average duration was 10 years and 2 months. The average expectation 24 years. The per centage on total mortality 8.05

3. *Paralysis*. Six cases of death ascribed to this 28  
cause occur in the list of the "British Empire." <sup>Paralysis</sup>  
One between 10 and 20; one between 30 and 40; two between 40 and 50; two between 60 and 70. The case of death at 17 was that of a medical apprentice, whose parents were living at the ages of 41 and 40. In this case the disease commenced as a consequence of suppuration in the internal ear, which extended itself inwards. Medical attendance continued for 3 months and 8 days. The case of death at 39 was that of a shoemaker, who lived a depraved and intemperate life, and became insane soon after acceptance. Of his mother we have no account. His father died at 49 of Ossification of the Heart. His sister was subject to Epilepsy. The death at 40 was that of a female; the illness lasted 53 days, and the disease is said to have been spinal.

Three of these six cases of palsy were clearly hereditary, and the other three were doubtful. An illustration of the importance of family history in judging of the individual risks that attach to each proposal for Life Assurance.

Forty-nine cases of Paralysis are recorded in the 37 years of the "Scottish Widows' Fund," already so often referred to. Of these, three occurred between 30 and 40. Three between 40 and 50. One between 50 and 60. One between 60 and 70. Two between 70 and 80.

29  
Tendency  
of Par-  
alysis to  
increase  
its per  
centage  
on the  
total mor-  
tality with  
the in-  
crease of  
the Com-  
pany's  
age.

It is remarkable that within the following period of 7 years (1853 to 1859) the number of Paralytic deaths mounts up to seventy-nine. Of this seventy-nine, however, Dr. Begbie remarks that each survived more than two-thirds of his expectation time, that is, 17.46 years on an average instead of 23.77. Of these, one only died between 20 and 30; two only 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 above 80. Thus it appears that of the seventy-nine, nearly two-thirds, namely forty-eight, occurred between the ages of 60 and 80.

The percentage of deaths from Paralysis in the first 37 years of the "Scottish Widows' Fund" (1815 to 1845) was 3.28 per cent., whilst the percentage of the last septennial period rises to 8.10 per cent. of the whole mortality. Probably this increased percentage of deaths from Paralysis will generally attend on the increased age of a Life Association; because those who have escaped other diseases and reached the period of age, and consequent decay, will in a large proportion, die of this disease.

In the report of the "Standard," Dr. Christison has classed together the deaths from Apoplexy and Palsy. In this the influence of the preceding rule appears in a slight increase of the second quinquennium. This inevitable increase among the deaths of this class, as the Company (or rather the senior members) becomes more aged, is compensated by the increased average survivancy. Thus in the first quinquennium, the average survivancy was only one-third of the expectation of life; in the latter, nearly one-half; whilst in the longer period of 37 years, in the history of the "Scottish Widows' Fund," the average survivancy became more than two-thirds of the expectation.

Under the head of Paralysis come most naturally <sup>29</sup> the cases of *Myelitis and Paraplegia*. Of the former, <sup>Paraplegin and Myelitis.</sup> one case happened in a female who was married, and at the age of 33. The duration of the attack was 13 days. She was the daughter of healthy parents, who had attained the ages of 71 and 84 at the period of her Insurance.

Of *Paraplegia*, two cases have fallen. The first was in a carpenter, aged 40, whose parents also attained to an advanced age. The duration of the disease was 8 months. The second was a grocer, aged 45, whose parents also reached a good old age. The duration of the disease was 5 months. The papers afford no medical details of the history of these cases.

Of these diseases no separate histories are given in the published histories of the Scottish Societies to which reference has so frequently been made.

Sixty-seven cases of Paralysis are included in 37 years' experience [1823 to 1860] of the "North British. The average duration of each after Assurance was 16 years. The average expectation, 22.37. The per centage on total mortality, 5.14.

30  
Convul-  
sions

4. *Convulsions.* No death under this head has occurred in the first ten years of the "British Empire Life Assurance." Only two occur in the 37 years of the "Scottish Widows' Fund (1815 to 1852), and in the history of the last 7 years of the same institution it is omitted altogether.

Five cases of death from Convulsions appear in the report of the "North British" within 37 years (1823-60). The average duration of life after Assurance was only 2 years and 9 months. The average expectation, 16.37. The percentage on total mortality, .30.

31  
Tetanus

5. *Tetanus.* Of this only one fatal case has occurred, which was in a male aged 32. It lasted only two days. The papers afford no details of the medical or surgical history of the case. It occurred within a fortnight after the insurance had been effected.

In 37 years (1815 to 1852) only two cases occurred in the experience of the "Scottish Widows' Fund." These were at a later period of life; one happening between 40 and 50; the other between 50 and 60. Within the last 7 years, only one case has occurred, which also was between 50 and 60.

In the first 5 years (1845 to 1850) the "Standard" had three cases of Tetanus, and none in the last 5 years (1850 to 1855).

No case of death from Tetanus appears in the records of the "North British."

6 *Epilepsy*. No death from this cause has yet occurred (1857) in the "British Empire."

32  
Epilepsy.

The "Scottish Widows' Fund," in 37 years (1815 to 1852) lost five insurers from Epilepsy. Three between 40 and 50; one between 50 and 60; and one between 70 and 80. Two more have fallen within the last 7 years (1853 to 1859). Both these occurred between 50 and 60.

Three cases of death from Epilepsy appear in the first quinquennium (1845 to 1850) of the "Standard;" and the same number in the second period of the same length (1850 to 1855).

The "North British" in 37 years (1823 to 1860), had sixteen deaths from Epilepsy. The average duration of life after Assurance was 9 years, 11 months. The average expectation 29.73. The per centage on total mortality 1.22.

An interesting point for further enquiry is suggested by a comparison of the experience of the four offices just mentioned; namely, Is the greater temperance of the insurers in our office a principal cause of our immunity from fatal cases of Epilepsy? In many Epileptics has been observed the same unhappy disposition to occasional fits of intemperance as is observable in those cases of insanity which have been classed under the head of *oino-mania* or *wine-madness*. The cerebral disease thus predisposes to an indulgence which again re-acts upon the disease; fits of intemperance being the immediate excitants of new attacks of Epilepsy or Insanity, or both.

33  
Influence  
of Tem-  
perance on  
Epilepsy.

7. *Insanity*. The "British Empire," have only one case of death from this cause in their first decennium.

34  
Insanity.

This was in a female of 50, married. When admitted, she was placed on the hazardous list, not on account of any supposed tendencies to Insanity deduced from her previous personal or family history, but on account of delicacy of constitution.

The first 37 years (1815 to 1852) of the "Scottish Widows' Fund," give only five deaths from Insanity. Two between 30 and 40; two between 40 and 50; and one between 50 and 60. The subsequent septennium gives three more deaths. One between 30 and 40; and two between 50 and 60.

The "Standard" reports give in the first 5 years (1845 to 1850) no death from Insanity; but in the last 5 years (1850 to 1855) five deaths.

The report of the "North British" gives only *three* deaths from Insanity. The average duration of life after Assurance was 14 years 1 month. The average expectation, 30.60. The percentage on total mortality, .23.

The chief importance of Insanity as an injurious risk in Life Assurance is not, however, to be calculated from its numerical ratio in a return of deaths, nor from its *direct* influence; but far more from its frequent relations to paroxysmal intemperance (as a cause as well as an effect); to a speculative and reckless temperament in commercial transactions; to moral depravity; to consumption; and perhaps, to other diseases, each of which has a tendency to shorten these lives, which, as a class, do not live out one-third of their expectancy.

8. *Delirium Tremens*. From this cause the "British Empire" have only two deaths in its first decennium.

The first was combined with Pneumonia, and terminated fatally in 8 days. This insurer was a college servant, and had suffered from previous attacks of Delirium Tremens. The second case terminated fatally in 8 days. This man was an innkeeper, and the attack was preceded by Erysipelas. Both diseases probably arose out of poisoning by alcohol.

Both these cases terminated at a little over 40 years of age. The first at 42; the second at 41; thus were both destroyed while yet in the prime of life. No history of intemperance in either of the parents appears; but the father of the second died at the early age of 30, from some cause not stated on the papers. Although no record of intemperance inherited from a parent appears on the face of these two cases, it occurs very frequently in the family histories disclosed by our life proposals, and in the examination papers, which are continually coming before us.

Thirteen deaths from *Delirium Tremens* are recorded in the 37 years (1815 to 1852) of the "Scottish Widows' Fund." Of these, one occurred between 20 and 30; three between 30 and 40; seven between 40 and 50; one between 50 and 60; one between 60 and 70. In the next 7 years, seven cases have fallen. Three between 30 and 40; three between 40 and 50; one between 50 and 60.

Eleven cases of death from *Delirium Tremens* occur in the report of the "North British Insurance Company" (1823--60) 37 years. The average duration of life after Assurance was 7 years 2 months. The average expectation, 32.02 years. The percentage on total mortality, .84

In the first quinquennium of the "Standard," two cases only of Delirium Tremens are recorded; but in the second quinquennium (1850 to 1855) are eight. Dr. Christison remarks that this is an alarming increase, upon which all he has 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."

37  
Age of  
principal  
mortality  
from  
Delirium  
Tremens.

In the reports of the "Standard" the period of life at which each death occurred has not been noted. In the twenty-two cases furnished by the 44 years experience of the "Scottish Widows' Fund," and the first 10 years of the "British Empire," it appears that twelve, or more than half, happened between 40 and 50 years of age; and six, or more than one quarter, during the preceding decennium (*i.e.*, from 30 to 40 years of age). Fifty-four years Life Assurance experience thus gives to Delirium Tremens 54.55 per cent. of its mortality between 40 and 50 years of age; and 27.27 per cent. between 30 and 40. Does the greater mortality in the second quinquennium of the "Standard," depend chiefly upon the greater age of the Company, by which many members passed from the 27 per cent. decennium to the more fatal decennium of 54 per cent.? It is remarkable that there is a sudden diminution in the following decennium of the age of the insurer (50 to 60 years of age) to 9.09 per cent., which again falls in the next decennium to 4.54 only. May it not be inferred from these observations, that of those assured lives in whom drinking habits have been formed, either before or after acceptance, only a few survive beyond fifty years of age?

9. *Disease of the Brain.* In the "British Empire" <sup>38</sup> four cases are recorded of Disease in various modes <sup>Disease of the Brain.</sup> affecting the Brain. The *first* is called Congestion. Its duration was 8 days. The insurer is said to have been a Registrar. His age was 36 years. Both parents were living. The *second* was of short duration, only 3 days. It seems to have been early attended by furious delirium, whereupon the patient was conveyed to the County Lunatic Asylum, where he died soon after his arrival. His age was 52 years, and it is worthy of notice, that his father is said to have died of anxiety, at 55. The *third* was in a young man of 37, a college servant. He is stated to have had Congestion of the Brain for 8 months, when he was seized with Convulsions, which terminated fatally in 4 days. The *fourth* case was one of Hydatids of the Choroid Plexus with *Ramollissement* of the Brain. It occurred in a man of 46, a saddler by occupation. The duration of the disease was 6 months.

The "North British," in its report of 37 years (1823 to 1860), includes thirty-six deaths from Disease of the Brain. The average duration of life after Assurance was 11 years 7 months. The average expectation, 25.81. The per centage on total mortality, 2.76.

The "Scottish Widows' Fund" in 37 years (1815 to 1852) lost seventy cases under this head. Of these, three died between 20 and 30 years of age; eleven between 30 and 40; eighteen between 40 and 50; seventeen between 50 and 60; sixteen between 60 and 70; four between 70 and 80; one at 80.

In the following septennium of the same Society

(1853 to 1859) sixty-six cases of death occur from this cause. Of these only one occurred between 20 and 30; 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; one above 80.

Under the analogous heading of Chronic Disease of the Brain, the "Standard" has three cases in the first 5 years (1845 to 1850), and twenty in the second 5 years (1850 to 1855). Dr. Christison notices that the deaths under this class seem to be pretty equally divided amongst the different occupations of life, with the exception of landed proprietors and clergymen. Thus under this class of Diseases of the Brain and Nervous System sixty-five deaths have occurred, diffused through thirty-five professions or occupations. Twenty-seven furnished *one* death each; writers, medical men, farmers, merchants, and bankers, furnish each *two*; writing clerks, *three*; landed proprietors, *seven*; and clergymen, *nine*.

#### CLASS IV.—DISEASES OF THE RESPIRATORY ORGANS.

39 1. *Laryngitis*. We have no death on record from  
Laryn- this cause within the first decennium of the "British  
gitis. Empire Life Assurance Company."

The first 37 years (1815 to 1852) of the "Scottish Widows' Fund" affords eight examples. Two between the ages of 30 and 40; four between 40 and 50; one between 50 and 60; one between 60 and 70.

In the subsequent 7 years four deaths were added. Two between 30 and 40; two between 60 and 70.

In the returns of the "Standard," Laryngitis must be included in the first class of diseases of the Respiratory Organs which numbers three examples in the first quinquennium, and five in the second.

In the "North British" three cases occurred within 37 years (1823-60). The average duration of life after Assurance was 9 years, 6 months. The average expectation 18.05. The per centage on total mortality .23.

2. *Bronchitis*. Ten deaths occurred in the "British Empire" from this disease, nine males, and one female of 51 years of age. One between 20 and 30; one between 30 and 40; four between 40 and 50; four between 50 and 60. 40  
Bron-  
chitis.

The "Scottish Widows' Fund" within 37 years (1815 to 1852) records fifty-four deaths from this source of mortality. Of these two occurred between 20 and 30; six betwixt 30 and 40; six between 40 and 50; eleven between 50 and 60; thirteen betwixt 60 and 70; eleven between 70 and 80; five after 80.

In the 7 years following there were forty-four deaths from Bronchitis. Of these two occurred between 30 and 40; three between 40 and 50; nine between 50 and 60; eighteen between 60 and 70; nine between 70 and 80; three above 80.

Bronchitis is classed with Influenza in the returns of the "Standard." Of this class there were fifteen deaths in the first 5 years (1845 to 1850), and sixteen in the second period of 5 years (1850 to 1855).

In 37 years experience of the "North British" occurred fifty-nine cases of Bronchitis. Of these the average duration of life after Assurance was 13 years, 11 months. The average expectation 20.56. The per centage of total mortality 4.52.

41  
Pleurisy.

3. *Pleurisy*. In the "British Empire" only two deaths appear under this head. One between 40 and 50; one at 50.

In the first 37 years (1815 to 1852) of the "Scottish Widows' Fund" eight deaths from Pleurisy are recorded. One between 20 and 30; one between 30 and 40; three between 40 and 50; three between 60 and 70.

In the next 7 years, seven more deaths occurred. Two between 30 and 40; one betwixt 40 and 50; two between 50 and 60; two between 60 and 70.

Pleurisy is classed with Pneumonia in the returns of Dr. Christison and will therefore be noticed under that head.

Dr. Burt records only four cases of Pleurisy as a cause of death in 37 years experience of the "North British" (1823-60). Of these the average duration of each after Assurance was 6 years, 4 months. The average expectation, 18.34 years. The per centage of total mortality .30.

42  
Pneumonia.

4. *Pneumonia*. Eleven deaths from this cause appear in the records of the first decennium of the "British Empire." Two between 20 and 30. One of these had been placed on the hazardous scale for delicacy of constitution. His parents were living at the time of acceptance. The duration of the case was 6 weeks. His occupation was that of a laceman.

He had anchylosed elbow-joint. It is probable this case was mixed up with Phthisis. The other case was that of a bricklayer, whose father died of Phthisis, while of his mother we have no account. The duration of the attack in this case was 22 days. Two deaths occurred between 30 and 40. The first of these was a master plumber, whose father died of intemperance at 37, and his brother from the same cause at 30, he himself died at 39. It is worthy of note how often members of the same family die at nearly the same age as one of the parents. The duration of the disease in this case was 13 days. The other case was that of a carpenter and joiner, whose father died at 64, of Cancer, and his mother at 59, of some unknown disease. We have no details as to the duration of this case. Six deaths occurred between 40 and 50. The first of these was a clerk; the second, a watchmaker; the third, a dentist; the fourth, a groom; the fifth, a baker; the sixth, a steel-converter. Five out of the six were *indoor* occupations, and one, that of the baker, always attended with a special risk of injury to the lungs from inhalation of a dusty atmosphere. The duration of medical attendance in these six cases was as follows,—32 days, 6 days, 6 days, 9 days, 10 days, and 21 days. One case happened between 50 and 60. This was under medical care only 2 days. The right lung only was affected, and the man being a labourer, it is probable the case was neglected in its early stages, and the severity of the season (January) increased the fatal tendencies of the disease.

To Pneumonia are ascribed only twenty-five cases of

death within the first 37 years of the "Scottish Widows' Fund." One of these occurred between 30 and 40; seven betwixt 40 and 50; nine between 50 and 60; three between 60 and 70; five between 70 and 80.

In the following septennium of the same Institution, the deaths from Pneumonia rose to forty-two. Of these, one happened between 20 and 30; five between 30 and 40; sixteen between 40 and 50; nineteen between 50 and 60; fifteen betwixt 60 and 70; five between 70 and 80; one above 80.

43  
Variation  
in the mor-  
tality from  
Pneumo-  
nia.

Dr. Begbie remarks that during the first 37 years of the Society's experience, the deaths from Pneumonia were only 1 and 4-5ths per cent. of the total mortality; while during the next 7 years they had risen to 4 and 1-4th per cent. This is partly accounted for by the greater prevalence of diseases of the respiratory organs during that period. In part also it arises from a larger proportion of deaths incident on an advanced age. The average expectation of the parties was 25.80 years; the average endurance 12.72 years, a survivance much beyond that of the consumptive risks.

In the first five years of the "Standard," twenty deaths are classed under the conjoined heads of Pneumonia and Pleurisy. In the second quinquennial period (1850 to 1855) the number rises to twenty-six. We have no minute details, nor any general remarks from Dr. Christison under this head.

In the "North British," forty-one deaths from Pneumonia happened within 37 years (1823—60). The average duration of life after Assurance was 10 years 7 months. The average expectation, 23.42. The per centage on total mortality, 3.14.

5. *Hydrothorax*. Only two cases have fallen within the first decennial period of the "British Empire." The first was a gentleman of 71 years of age; of whose case we have no details. The second was a superannuated exciseman, of 65 years of age. His medical attendance was of the duration of 31 days. He held two policies, and upon the last proposal a surcharge had been made of extra risk. Each of these insurers failed to reach the full period of their expectancy by about 8 years.

44

Hydro-  
Thorax.

The first 37 years of the "Scottish Widows' Fund" yielded twenty-five cases of death from Hydrothorax, differing only by one from the number of deaths by Pneumonia during the same period. Of these, one occurred between 30 and 40; six between 40 and 50; eight between 50 and 60; six betwixt 60 and 70; three between 70 and 80; two after 80.

The following 7 years gave seven cases additional. Of these, three occurred between 40 and 50; one between 50 and 60; two betwixt 60 and 70; one between 70 and 80.

This class is not separately noticed in the records of the "Standard."

Of Hydrothorax, twenty-one fatal cases occurred in the experience of 37 years (1823—60) of the "North British." The average duration of life after Assurance was 9 years 4 months. The average expectation 22.70. The per centage on total mortality, 1.61.

6. *Asthma*. Of this disease the "British Empire" has had only two fatal instances. One occurred at 56 years of age, in a post-master, whose father died at 57, probably of the same disease. The Asthma is said to

45

Asthma.

have been accompanied by Hypertrophy of the heart, and for the last 2 days by Bronchitis. This case was taken on the hazardous list. The second example was that of a tax-collector, in whom Asthma had existed 7 years, when it terminated in dropsy, which was fatal in 9 months, when he was 50 years of age. His father had died at 33, but the disease was unknown. In the first of these the duration of medical attendance was only 2 days; and in the latter only 21;—either because danger is not perceived in these cases of habitual difficulty of breathing until the case becomes hopeless; or, that under recent alarm, a different medical attendant is called in near the close of the disease, whose certificate only is sent to the office.

The first 37 years of the "Scottish Widows' Fund" (1815 to 1852) record only four deaths from *Asthma*. Two of these occurred between 50 and 60; one betwixt 60 and 70; one between 70 and 80 years of age. In the 7 years following, one more death was added from this disease. This occurred between 60 and 70.

This class is not separately noticed in the returns of the "Standard."

Six cases of deaths from *Asthma* are found in the history of 37 years of the "North British" (1823-60). The average duration of life after Assurance was 15 years 4 months. The average expectation, 20.73. The per centage of total mortality, .46.

46  
Consumption. 7. *Consumption*. The important part which is held by this disease in the returns of the Registrar General of the whole mortality of the country is well known. The still greater importance which belongs to it

because of the periods of life at which its principal ravages take place, embracing between 20 and 50 years of age; the three decenniums which comprehend the spring and the summer of human life, may be more easily conceived than described. No other single disease makes so much havoc of the hopes of families by destroying their young men; no other so frequently removes the pillar of the household, making the wife a widow, and the children fatherless.

In relation to the pecuniary interests and prosperity of a Life Assurance Company, this disease wears a very grave aspect. There are reasons for thinking that *the ratio of the mortality of different classes is not equally divided among the community*, but that it falls with peculiar severity upon the industrial middle classes. This may be partly accounted for by the length of their labour, and the brevity of their hours of rest—but still more by the anxiety and care they suffer, especially when their expenses from an increasing family have continually a tendency to augment more rapidly than their income.

In the earlier years of a Life Assurance Company, the proportion of deaths from this disease is also likely to be large, because of their emergence at an early period of life; and, although from this cause the percentage of lives lost will be great, the percentage of premiums lost will be greater still. This we shall be able to demonstrate in a striking manner from the returns of the "British Empire."

Sixty-seven of our insurers have died from Phthisis in our first decennium. Of these one death occurred under 20 years of age; fourteen from 20 to 30;

47

Ratio of mortality in the different classes of society unequal.

48

Unequal also in the earlier and later years of an Assurance Company

thirty-three from 30 to 40; nine from 40 to 50; nine from 50 to 60; one between 60 and 70.

49 On dividing these deaths into three classes, of *hereditary, doubtful, and non-hereditary*:—founding this classification upon a careful analysis of the family history of *each* case, so far as it has been faithfully reported to the office—we find that to the *hereditary* section, or those in whose immediate relations (generally one of the parents) this disease has shown itself; might be reckoned twenty-one. The second class, or *doubtful*, is made up of those in whom the hereditary pre-disposition might be suspected, but the evidence was less conclusive. This section numbers twenty-three. The third class comprises those, the analysis of whose family history afforded no instance of Phthisis, or Phthisical diseases; of these there are twenty-four. Thus it might generally be stated that these three classes were nearly equal.

If we compare these results of 31, 34, and 35 per cent, as representing the three classes of *hereditary, doubtful, and non-hereditary* in the deaths from Phthisis, occurring in the experience of the “British Empire Life Assurance Company:” with the proportions of like classes recorded in the Second Medical Report of the Hospital for Consumption; we shall find a remarkable difference in the results of the first class (in which the evidence of hereditary origin is tolerably certain); and then a nearer approximation if we add together the first and second classes (the latter including those in whom the evidence of hereditary origin is either deficient or doubtful).

50 Of six thousand one hundred and eighty-three

deaths from Phthisis occurring in the experience of the Consumption Hospital, four thousand and thirty-two (*i.e.*, one thousand eight hundred and seventy-seven males and two thousand one hundred and fifty-five females) were decidedly hereditary; giving a proportion of 65 per cent, instead of 31, to the first or *hereditary* class. If next, we take the second, or doubtful class (comprising one hundred and forty-eight males and three hundred and two females), we shall find the proportion to be only 7.29 per cent. instead of 34. But if we add together the first and second classes (the hereditary and the doubtful) we obtain results of 72.49 per cent. in the experience of the Hospital, and of 65 per cent. in that of the Company.

Still, taking this nearest approximation of results in the experience of these two Associations, there is a difference of 7.29 per cent. in the aggregate of the two sections of hereditary and doubtful.

It may be assumed then that the proportion of cases which we have assigned to the decidedly hereditary class is very considerably below the truth; and that the proportion of the third class, (or non-hereditary) ought to have yielded only 27 per cent. instead of 35.

51  
Greater accuracy of the disinterested evidence at the Consumption Hospital

These various figures in the experience of the Life Assurance Company, as compared with that of the Hospital, shew with presumable accuracy, in what proportion it is more easy to arrive at the *truth* of family histories, when no pecuniary loss, nor any social disadvantage, is likely to arise from a fair and frank statement, in which there is no attempt at either concealment or misrepresentation.



employed by the Office placed upon the hazardous list. The Agent procured a report of another medical man, which was altogether favourable. It was then objected that the evidence on each side was equal; a third examiner was therefore chosen, who agreed with the second, in reporting that the life in question was sound and good. The Office was thus prevailed on to accept an insurer who survived examination only 11 months. The amount of popular discontent, not to say tumult, about these just and necessary surcharges which was excited by interested parties at one of the Annual Meetings, will not soon be forgotten.

The first 37 years (1815 to 1852) of the "Scottish Widows' Fund" yields one hundred and fourteen deaths from Consumption (8.55 per cent. of the total mortality from all causes). Of these fifteen occurred between 20 and 30 years of age; forty-seven between 30 and 40; twenty-six between 40 and 50; seventeen between 50 and 60; eight between 60 and 70; one between 70 and 80.

The subsequent 7 years of the same Institution (1853 to 1859) gives sixty-six additional deaths from Consumption. Of these nine occurred between 20 and 30; sixteen between 30 and 40; twenty-two between 40 and 50; Sixteen between 50 and 60; three between 60 and 70. Of these sixty-six Dr. Begbie remarks, "Not one reached his expectation term." It is also worthy of remark, that nineteen (or more than 28 per cent.) occurred after the age of 50; "and not less so, that of the number ten took place in parties who had affected Assurance after the age of 45" (or more than 15 per cent.).

In the returns of the "North British Insurance Company" during 37 years (1823-60) there occur one hundred and seven cases of Consumption. The average duration of Life after Assurance was 7 years 11 months. The average expectation, 30.64. The per centage on total mortality, 8.21.

In the returns of the "Standard," Consumption is placed under the class of Diseases of Depraved Constitutional Habits. In the first 5 years (1845 to 1850) twenty-nine deaths occurred. In the second quinquennium, sixty. In the first period of twenty-nine deaths, only one died before 30; and only seven more before 35. In the second period, thirteen died before 30; twenty-seven from 30 to 40; twelve from 40 to 50; six from 50 to 60; and above 60, two.

55  
Average  
survi-  
vancy of  
Con-  
sumptive  
Assurers

Dr. Christison observes that the average survivancy of these cases was about one-sixth only of their term of expectancy. Of the sixty deaths in the last quinquennium, no fewer than fifty-five fell at or before the completion of the tenth year after acceptance; and of these, thirty actually fell at or before the completion of the fifth year only."

56  
Average  
mortality  
at differ-  
ent pe-  
riods of  
life

If we add together the sum of deaths from Consumption, in the first 10 years of the "British Empire Life Assurance," in the 44 years of the "Scottish Widows' Fund," and the second quinquennium of the "Standard" (the first being excluded because it is without the classification of ages contained in the other returns) we obtain a total of three hundred and seven; of whom two died under 20 years of age; fifty-one between 20 and 30; one hundred and twenty-three between 30 and 40; sixty-nine between 40 and 50;

forty-eight between 50 and 60; thirteen between 60 and 70; one between 70 and 80.

Upon looking at this history we are struck with the wide range of that period of human life which is liable to the inroads of Phthisis. Two cases under 20 years of age, and one beyond 70; thus comprehending the two extremes of insurable life. It is worthy of remembrance that nearly 20 per cent. of the deaths occurred after 50 years of age; that thirteen occurred after 60 (or 4.53 per cent of the whole) and that one happened after 70.

Wide range of Phthisis over different ages of human life

If we compare the ratio per cent. of deaths at different periods of life in our own Company, as compared with the general averages of the same order, we find additional proof of an observation already made of the great severity with which the industrial class of insurers is visited with this disease. In the general average, described in a preceding paragraph, we find that 56.67 per cent. of these deaths occurred before 40 years of age; but in our own class the per centage rises to 69.99. In the general average the deaths between 30 and 40, amount to 40.06 per cent. In our own class they rise to 49.25. In the general average, 16.61 per cent. of the deaths happened betwixt 20 and 30. In our own list, the average of that period rises to 20.74 per cent.

57  
Comparative ratios of mortality from Phthisis

These researches demonstrate the important relations existing between this disease and the commercial prosperity of a Life Assurance Company. For although it would be repugnant to the first and fundamental principle of Life Assurance, which is, that the long lives should pay for the short ones, to exclude

58  
Great importance in industrial assurance of keeping clear of this class of lives, or of adequately surcharging them

any class, yet, on the other hand, if by any circumstances the short lives should be permitted very much to exceed their due proportion, the Company would itself be in danger of gradually declining from a state of commercial prosperity, to one of commercial difficulties. The diligent use of those means of investigation which may enable us beforehand to distinguish consumptive lives, in order either to reject them, or to surcharge them in some fair proportion to the additional risk, is not only therefore of importance to all Life Assurance companies, but would, *a fortiori*, be of highest importance to our own.

59 Not the  
deaths  
from a spe-  
cial class,  
but the  
ratio de-  
rived from  
a compari-  
son of the  
total mor-  
tality with  
the lives at  
risk, the  
true test of  
prosperity

The deduction would, however, be unfair and untrue, if from the large proportion of consumptive deaths it were inferred that the business of any particular company was unprosperous,—such a deduction, to attain any thing like an approach to truth, must be taken from a more comprehensive survey; including not merely the per centage of deaths from *one* disease, or cause of death, but from *all*,—which must be founded upon a view of the *survivors* as well as of the *dead*, namely, on the *annual ratio of mortality*.

60 The mor-  
tality is  
unequally  
divided in  
different  
Compa-  
nies

In one class of insurers, where Consumption prevails with excessive severity, taking a large per centage of its deaths, it will always be found, as we shall hereafter demonstrate in the case of our own Company, that the per centage from nearly all other causes of death is diminished, and in relation to some, entirely absent.

61 Necessity  
therefore  
of com-  
prehen-  
sive inves-  
tigations

One branch of a fruit tree may become blighted, whilst the other branches escape and become loaded with fruit; and so in any extensive business, we may see a particular branch of it unfruitful, whilst the

others are prosperous. No doubt if by any improvement in the methods of procedure, we could lessen the per centage of consumptive risks, without increasing those of any other kind, we should add most remarkably to the profits of the Company. Whether such improvement be practicable, and by what means it ought to be effected, we shall consider hereafter, in looking at the several elements which belong to the investigation of the value of life proposals in general; as well as the various sources of error in arriving at an estimate of the value of each, individually considered.

The average duration of the disease in fifty-seven 62 cases in which a medical certificate of the duration of attendance was returned to the Office, amounted to <sup>Average duration of medical attendance</sup> 5 months and 3 days. The individual periods, however are very unequal: in ten, being not more than 10 days each; in two not more than 2 days; in others, reaching to 15, 20, and 25 months. This variety, and occasional brevity accord with general medical experience.

8. *Disease of the Lungs.* Under this head are 63 classed such cases as do not strictly belong to either <sup>Disease of the Lungs</sup> of the foregoing sections. The "British Empire" have to report only two under this head, which were both cases of Hæmoptysis. The first of these occurred in a female 40 years of age, who had been taken on the hazardous list. Her death was sudden. Her mother probably died of Phthisis at 50. The other was a Custom-house clerk aged 33, whose illness lasted 12 months; a case which but for the accident of the Hemorrhage would have been ranked with the

preceding class of cases of Consumption. In this case there was no evidence of hereditary predisposition.

In the first 37 years of the "Scottish Widows' Fund" there appear forty-two deaths classed under this head. Of these one occurred between 20 and 30 years of age; seven betwixt 30 and 40; eight between 40 and 50; nine between 50 and 60; nine between 60 and 70; five between 70 and 80; three above 80.

The subsequent 7 years (1853-9) yield twenty-five deaths under this section. Of these three died between 30 and 40; nine betwixt 40 and 50; six between 50 and 60; four between 60 and 70; three between 70 and 80.

The "North British Insurance" under this section classes thirty-four cases during 37 years. The average duration of each after Assurance was 9 years 4 months. The average expectation, 28.95. The per centage on total mortality, 2.60.

In the returns of the "Standard" this heading is not adopted, and the deaths are probably divided amongst other classes of diseases connected with the respiratory organs. It is indeed rather an indefinite class, probably intended to include all those cases which could not with propriety or accuracy be placed under any one of the foregoing sections of Disease of the Lungs.

CLASS V.—DISEASES OF THE HEART AND BLOOD-  
VESSELS.

1. *Pericarditis*. The “British Empire” has no <sup>64</sup>Pericar-  
ditis death recorded from this cause.

Within the first 37 years of the “Scottish Widows’ Fund” (1815 to 1852) there happened four cases of Pericarditis. Two between the ages of 30 and 40, and two between 40 and 50. Within the following 7 years (1853 to 1859) two more occurred, one between 50 and 60; another between 60 and 70.

We do not find any death from Pericarditis in the returns of the “Standard.”

The “North British” in the course of 37 years (1823-60) records only two cases of death from Pericarditis. The average duration of life after Assurance was 10 years, 2 months. The average expectation, 19.26. The per centage of total mortality, .15

2. *Aneurism*. Of this the “British Empire” has <sup>65</sup>Aneurism had one case, in a smith. It is said to have been Aneurism of the Aorta. It occurred at the age of 44.

(A sub-section should be here inserted to comprehend Phlebitis.) Of this we have only one case which occurred in the wife of a master baker aged 46. It is said to have been of 10 days duration, but was not under medical treatment for more than 7 days.

In the first 37 years of the “Scottish Widows’ Fund” there occurred fourteen cases of Aneurism. One between 30 and 40 years of age; six between 40 and 50; three between 50 and 60; three betwixt 60 and 70; and one at 80.

In the septennium following (1853 to 1859) there happened eleven more cases. Of these one fell between 40 and 50; five betwixt 50 and 60; five between 60 and 70.

In the experience of 37 years the "North British" includes seventeen cases of Aneurism. The average duration of life after Assurance, was 9 years 10 months. The average expectation, 26.49. The percentage on total mortality, 1.30.

In the returns of the "Standard" we have a section of Diseases of the Blood-vessels. This would include both Aneurism and Phlebitis. Under this class five deaths are registered within the first quinquennium, and three in the second.

66      3. *Disease of the Heart.* Six cases under this head  
 Disease of the Heart are registered in the "British Empire," first decennium, four males and two females. Of these, two, one male and one female, occurred between the ages of 30 and 40; two between 40 and 50; two betwixt 50 and 60.

One of these was a draper, who died at the age of 56. It seems probable that his mother, who died at 40, was the subject of the same order of disease. His son also, who subsequently died at a very early age of fever, was placed on our hazardous list at a very high premium, on account of Hypertrophy of the Heart, to a large extent the sequel of Rheumatic Pericarditis. One, who died at 35, was a grocer, whose disease was also from one attack only of Rheumatic Endocarditis and Pericarditis. In the case of the female who died at the age of 53, with dropsy, from Diseased Heart, she had been placed on the hazardous list, for the faults in her family history,—

her father having died at 51, of Gravel, and her mother at 68, from Cancer. The influence of hereditary predisposition may be suspected in one-third of our cases of Heart Disease.

The "Scottish Widows' Fund" in its first 37 years yields one hundred and one deaths under this head; or 7.58 per cent. of the total mortality, the "British Empire" mortality being 2.33 per cent. of the total number of deaths.

As to the decennial periods of life at which these 67  
occurred:—one was between 20 and 30; nine between 30 and 40; sixteen between 40 and 50; thirty-five between 50 and 60; thirty-one between 60 and 70; eight between 70 and 80; one above 80. Distribution over decennial periods of life

The next 7 years of this Company (1853 to 1859) yields one hundred and twenty-two deaths under this head, being 12.51 per cent. of the total mortality of that septennium; or a rise of 4.93 per cent. as compared with the experience of the 37 years' preceding. "This at first sight," Dr. Begbie observes, "may appear discouraging, but is satisfactorily accounted for. Chronic disease of the Heart, is perhaps, more than any other, the disease of old age; and hence we find, on a reference to our tables, that of these one hundred and twenty-two deaths, twenty-two only occurred before the age of 50; thus leaving one hundred 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 shew, 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 the reports of the "Standard" we have sixteen cases of Diseased Heart in the first quinquennium, and thirty-seven in the second; or an increase from 5.46 per cent. of the total mortality to 8.72.

68 Dr. Christison remarks on this head, "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 with 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 have occurred to myself, as the Company's examining officer at head-quarters."

69 An example of this head occurs to my memory in the "British Empire" experience. A gentleman who said he had never had a day's illness presented himself for examination. A distinct and well-marked *bruit de soufflet*, demonstrated so serious a lesion of the valves on the left side of the heart, that it was recommended that the case should be declined, or accepted only at a high premium for additional risk. A second attempt after some interval was made by this proposer to get his name on the healthy class, but of course in vain. Afterwards we heard that after some unsuccessful attempts of like nature with other established offices; he succeeded in getting acceptance as a first class life by becoming a Life Assurance Director.

The "North British" in 37 years met with one

Difficulty  
of diagnosis  
in some  
cases

Frequent  
absence of  
all symptoms  
except those  
which are  
auscultatory

hundred and three deaths from Disease of the Heart. Of these the average duration of life after Assurance was 12 years 8 months. The average expectation was 24.72. The per centage on total mortality 7.90.

CLASS VI.—DISEASES OF THE DIGESTIVE APPARATUS.

1. *Stomatitis, Gastritis, and Enteritis.* One example occurred of the first of these in the "British Empire," in a carrier aged 28. It is called in the death certificate Inflammation of the Throat; but as there was no medical attendant, the true nature of the case is not certain.

70  
Stomatitis  
Gastritis

Of *Enteritis* the "British Empire" has had two examples. The first in a female 43 years of age, of whose case we have no details. The second in a collector of rates aged 44. The illness lasted 11 days, and for the last 4 days is said to have been complicated with Pneumonia.

71  
Enteritis

Under this head the records of the "Scottish Widows' Fund" present thirteen cases of Gastritis and Enteritis in the first period of 37 years. Of these two occurred between 20 and 30; two between 30 and 40; four between 40 and 50; three betwixt 50 and 60; two between 60 and 70.

72  
Distribu-  
tion of  
Deaths

In the next 7 years (1853-9) nine more deaths occurred under this class. Of these three happened between 30 and 40; one between 40 and 50; three betwixt 50 and 60; one between 60 and 70; one between 70 and 80.

The "Standard" under the heading of Diseased Stomach reckons eleven deaths in the first quinquennium, and two in the second.

Under the head of Gastritis, the "North British" records in 37 years (1823-60) three deaths. The average duration after Assurance was 10 years 11 months. The average expectation 26.50. The per centage on total mortality .23.

Under the head of Enteritis the same Company, and in the same period, numbers thirteen fatal cases. In these the average duration of life after Assurance was only 5 years and 6 months. The average expectation was 32.26. The per centage on total mortality .99.

2. *Peritonitis*. Of this the "British Empire" has had four examples. One between 20 and 30; two between 30 and 40; and one betwixt 40 and 50. The first of these occurred to a printer 24 years of age, it supervened on another disease, on the 19th day of which Peritonitis occurred, and was fatal in 5 days. In another case the Peritonitis was caused by Ulceration of the Intestine, and it was fatal in 6 days. In a third it occurred as a consequence of Parturition, at the age of 31, and continued a month before its fatal termination, the mother of this lady also died in child-birth at 26. In the fourth case, there appears to have been no medical attendant, it occurred in a butler of the age of 42 years.

The first 37 years of the "Scottish Widows' Fund" present only five cases of Peritonitis. Of these, two occurred between 20 and 30 years of age; one between 30 and 40; one between 40 and 50; one between 50 and 60. The next 7 years (1853-9) present eight.

Of these, three occurred between 20 and 30; three between 40 and 50; two between 50 and 60. In this septennium the decennium of age betwixt 30 and 40 is without one.

No case of this disease occurred within the first quinquennium of the "Standard" (1845 to 1850) and only three in the second like period of time (1850 to 1855).

The "North British" within the first 37 years (1823 to 1860) met with five cases of death from Peritonitis. The average duration was 11 years 6 months. The average expectation, 25.23. The per centage on total mortality, .38.

3. *Ulceration of the Bowels.—Perforation.* Of this class the "British Empire" has had three instances, all terminating by Perforation. The first, at 37 years of age, was a servant. He was under medical care 11 days. The second was a cowkeeper, 40 years of age. This case was fatal in 2 hours. He had previously been subject to pains in the bowels, sometimes lasting for 3 weeks, and returning at intervals. The third was a truss-maker. He was of peculiar chlorotic appearance, although 41 years of age at the time of his death. He had a constitutional dislike for all animal food, except in the most indigestible forms; such as cold ham, and cold salt beef. He had suffered about 2 years previously from a long attack of Dysentery, from which he seemed to have recovered before the time at which he presented his life proposal. One year afterwards he was attacked with Choleraic Diarrhœa, Cholera being at the time epidemic, and after an illness of 3 weeks, he died.

74  
Ulceration of the  
Bowels.  
Perforation

On *post-mortem* examination, Perforation was found at a portion of Intestine which had been injured by the former attack of Dysentery. This life had been accepted on the hazardous list.

Of *Ulceration of the Bowels*, the "Scottish Widows' Fund," within the first 37 years (1815 to 1852), records eleven cases. Three of these occurred between 30 and 40 years of age; two betwixt 40 and 50; one between 50 and 60; four between 60 and 70; one betwixt 70 and 80.

Within the 7 years following there occurred three cases; two between 40 and 50; one between 70 and 80.

75  
"Scottish  
Widows'  
Fund,"  
"Stan-  
dard,"  
"North  
British"

Dr. Christison mentions only one case of Perforation of the Bowels as having occurred in the experience of the "Standard," and during its second quinquennium.

Seven cases of *Ulceration of the Intestines* occurred in the history of 37 years of the "North British." The average duration of life afterwards was 10 years 11 months. The average expectation was 29.49. The per centage on total mortality, 53.

76  
Hernia

4. *Hernia*. Only one case of death from this cause occurred within the first decennium of the "British Empire Life Assurance Company." This was in a gentleman of 60 years of age. He was under treatment 76 hours. The operation was performed 16 hours after strangulation had taken place. Peritonitis occurred subsequently, and was fatal in 16 hours.

Three fatal cases of *Hernia* fell within the first 37 years of the "Scottish Widows' Fund." Of these one occurred between 30 and 40 years of age one between 40 and 50; one been 60 and 70.

Within the last 7 years (1853 to 1859) no case has occurred.

No case of death from *Hernia* appears in the reports of the "Standard," but in the first quinquennium there is one death from *Obstruction of the Bowels*, and in the second quinquennium nine are recorded under this head.

Of death from *Hernia* only three cases occur in the history of the "North British" 37 years (1823-60). The average duration of these lives after Assurance was 21 years 10 months. The average expectation 24.79 years. The per centage of total mortality .23.

5. *Colic*. One death, that on a married female at 42 years of age, appears under this head in the experience of the "British Empire." The illness lasted 21 days. Her father died young, but we have no details either of his age, or of his diseases. Her mother died at 60, it is said of old age.

77  
Colic  
Ileus

In the returns of the "Scottish Widows' Fund" we find nine cases of death from *Colic, or Ileus* during the first 37 years. Of these three took place between 40 and 50 years of age; three betwixt 50 and 60; two between 60 and 70; and one between 70 and 80.

In the following 7 years five cases of *Ileus* occurred. One between 30 and 40; one betwixt 50 and 60; one between 60 and 70; two between 70 and 80. Thus it appears that the fatality of this disease increases with the advance of age.

No information on this head appears in the returns of the "Standard."

Two deaths are recorded from *Ileus* in the history of the "North British." The average duration of

these policies was 20 years 7 months. The average expectation, 24.63. The per centage on total mortality, .15.

78 *Hæmatemesis.* Of this we have no instance in the first 10 years of the "British Empire." The "Scottish Widows' Fund" records three cases; one between 30 and 40; one betwixt 40 and 50; one between 50 and 60. These occurred within the first 37 years; during the following 7 the number of cases was increased to seven. Of these one died between 40 and 50; one betwixt 50 and 60; four between 60 and 70; one between 70 and 80.

No cases are classed under this head in the return of the "Standard."

In the 37 years (1823 to 1860) of the "North British," there occurs three cases of death from *Hæmatemesis*. The average duration of life after Assurance was 8 years 1 month. The average expectation 31.70. The per centage on total mortality. 23.

79 *Disease of Stomach and Bowels.* This is a comprehensive and somewhat indefinite heading. With us it, however, includes four cases: one between 40 and 50; one betwixt 50 and 60; two between 60 and 70. One of these was a case of *Gastro-Enteritis* occurring in a baker 47 years of age. The illness was short, medical attendance being only of 3 days' duration. This man had been placed on the Invalid List at the time of his acceptance, on account of some Chronic Bronchial affection. Another was a case in which Disease of the Stomach was combined with Disease of the Heart. This was only of 25 days' duration. A third case is meagre in its details. In

a fourth case Diseased Stomach was associated with Disease of the Kidneys.

Sixty-four cases occurred under this class within the first 37 years of the "Scottish Widows' Fund." Of these sixty-four occurred between 20 and 30 years of age; eight between 30 and 40; eight between 40 and 50; twenty-one between 50 and 60; fourteen between 60 and 70; nine betwixt 70 and 80.

Within the following septennium of the same Company, thirty-one cases were added to the preceding. Of these three occurred between 30 and 40; three betwixt 40 and 50; nine between 50 and 60; twelve betwixt 60 and 70; four between 70 and 80.

In the records of the "Standard," eleven deaths from Diseased Stomach appear in the first quinquennium (1845 to 1850); and seven in the second (1850 to 1855).

Twenty-seven deaths from Disease of the Stomach and Bowels appear in the history of 37 years of the "North British" (1823—60). The average duration of these after Assurance was 8 years 10 months. The average expectation 21.57 years. The per centage on total mortality, 2.07.

8. *Hepatitis*. Of this disease the "British Empire" 80 has only two cases within its first decennium. Both <sup>Hepa-</sup>titis occurred between 40 and 50. One was a pawn-broker of 41 years of age. The duration of his illness was only 15 days. The second was a draper and collector. He died at the age of 40. His illness was of 4 months' standing, and within the last 4 weeks was complicated with Anasarca and Hydro-Pericarditis.

Within the first 37 years (1815 to 1852) of the "Scottish Widows' Fund" ten cases happened of Hepatitis. Of these two occurred between 40 and 50; five between 50 and 60; two betwixt 60 and 70; one between 70 and 80.

The next 7 years (1853—9) added only two cases under this section. Of these one occurred between 30 and 40; the other betwixt 40 and 50.

These cases do not appear under this head in the "Standard's" classification.

Of Hepatitis there were six deaths in the first 37 years of the "North British." The average duration of these lives after Assurance was 8 years 7 months. The average expectation 27.38 years. The per centage on total mortality .46.

81  
Jaundice 9. *Jaundice.* During the first 10 years of the "British Empire" no death occurred under this head. During the first 37 years of the "Scottish Widows' Fund" (1815—1852) there happened six fatal cases of Jaundice. Of these, one happened between 30 and 40; one between 40 and 50; one between 50 and 60; three between 60 and 70.

One case only was added (also between 60 and 70), during the next 7 years of the same Company.

No death from Jaundice is noticed in the returns of the "Standard."

In the records of the "North British" are found eleven deaths from Jaundice during the 37 years (1823—60). The average duration of these lives after Assurance was 11 years 6 months. The average expectation 23.49 years. The per centage on total mortality .84.

10. *Disease of the Liver.* Seven cases occur under this heading within the first decennium of the "British Empire Life Assurance Company." Of these, one fell between 20 and 30; four between 30 and 40; two between 50 and 60; one between 70 and 80. In three cases the Disease of the Liver was accompanied with Diseased Lungs; and in a fourth, it is said there was Marasmus. This case was also one of those in which a certain number of the members of a family die about the same age; probably from some transmitted predisposition to diseases more or less related to each other. In this instance the age of the father at death was 58, of the mother 54, and of the son 53.

82  
Disease of  
the Liver

In the records of the first 37 years of the "Scottish Widows' Fund" (1815—52), forty-seven cases of death are ascribed to Disease of the Liver. Of these three died between 30 and 40; twelve between 40 and 50; eighteen between 50 and 60; seven between 60 and 70; seven between 70 and 80.

Within the following septennium of the same Company (1853-9) forty-nine deaths are classed under this head. Of these, one fell between 20 and 30; four between 30 and 40; thirteen between 40 and 50; sixteen between 50 and 60; seven between 60 and 70; seven between 70 and 80; one above 80.

In the returns of the "Standard," eleven deaths from Diseased Liver occur within the first quinquennium (1845 to 1850). Twenty-three happened within the second quinquennium (1850 to 1855).

Fifty-five deaths from Disease of the Liver happened in 37 years' experience of the "North British" (1823-60). The average duration of these

lives after Assurance was 10 years 7 months. The average expectation 24.89 years. The per centage on total mortality 4.22.

# CLASS VII.—DISEASES OF THE URINARY ORGANS.

83  
Ischuria

1. *Ischuria*. No case has occurred within the first 10 years' experience of the "British Empire Mutual Life Assurance Company."

The "Scottish Widows' Fund" lost only two cases within its first 37 years from this disease. One between 50 and 60 years of age; one between 70 and 80.

Within the following septennium two more deaths happened under this head. One between 50 and 60 years of age; and one between 70 and 80; according as to the period of life at which Ischuria occurs, with the former return.

Dr. Christison mentions no case of Ischuria in the returns of the "Standard."

84  
Diabetes

2. *Diabetes*. Of this disease no case has fallen within the first 10 years of the "British Empire Mutual Life Assurance Company."

Four cases appear in the records of the first 37 years of the "Scottish Widows' Fund." These were equally divided between the four decennials, following the age of 30 years: namely,—one between 30 and 40; one between 40 and 50; one between 50 and 60; one between 60 and 70.

The next 7 years of the same Company yield four cases of Diabetes also equally divided between the

same periods; namely, one between 30 and 40; one between 40 and 50; one between 50 and 60; one between 60 and 70.

Dr. Christison mentions no case of death from Diabetes in the returns of the "Standard." In the previous returns of Mr. Wood,\* whose table extends over 20 years (1825 to 1845), only one case is recorded.

The "North British" in its first 37 years records only two cases of Diabetes. The average duration of life after Assurance was 11 years. The average expectation, 24.75. The per centage of total mortality .15.

3. *Cystitis*. This also is a disease to which the "British Empire Mutual Life Assurance" returns at present are *nil*. 85  
Cystitis

The first 37 years of the "Scottish Widows' Fund" yield nine cases of death from this disease. Of these one occurred between 50 and 60 years of age; two between 60 and 70; five between 70 and 80; one after 80.

The next 7 years contain two more cases. One between 60 and 70; one between 70 and 80.

Cystitis does not appear as a distinct heading in the returns of the "Standard." Any cases of this kind would probably be included in the section of *Diseased Bladder*.

4. *Stone*. Of this disease no example appears in our present list of the first decennium of the "British Empire Mutual Life Assurance Company." 86  
Calculus  
of the  
Bladder

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\* But little use has been made of these returns in the present *resumé* because their accuracy is less to be depended upon than those of later years.

Two instances appear in the first 37 years of the "Scottish Widows' Fund." Of these one occurred between 60 and 70 years of age; and one between 70 and 80. No case is added in the succeeding 7 years.

No case of death from *Stone* occurs in the returns of the "Standard."

The returns of the "North British" record no case of death from *Stone*.

87  
Disease  
of the  
Kidney

5. *Disease of the Kidney.* Three examples of this class are contained in the records of the first 10 years of the "British Empire." Of these two occurred between 40 and 50 years of age; one between 50 and 60. These were all cases of Bright's Disease. The first occurred to an inn-keeper; a class, according to some authors of considerable celebrity, much exposed to attacks of this disease. The death certificate stated that the illness had existed for 18 months; but the medical attendance had been only for 6 weeks. The second case was that of a master glass-cutter, whose illness had been of 3 months' duration. He died at 40 years of age. His father died of Diseased Brain at 48; but his mother at the early age of 24, it was said of child-birth. The third was the case of a distinguished serjeant-at-law. With him the illness is said to have been of 3 months' duration; although it seems probable that it was much longer. The father of this gentleman was a medical practitioner, who died at 84 years of age. His mother also reached 73. Their energetic and celebrated son died at 52. But considering his vicissitudes, his anxieties, and his occasional gigantic exertions, probably the 52 years of the son comprehended an expenditure of vital power

more than equal to the 84 years of the father. At the time of admission he was in the most robust health, such as suggested the reasonable expectation that he might live as many years as his father had done.

The "Scottish Widows' Fund" records twenty-three cases of death from Disease of the Kidneys within its first 37 years (1815 to 1852). Of these three died between 30 and 40 years of age; four between 40 and 50; twelve between 50 and 60; four between 60 and 70.

In the following septennium the mortality under this head of the institution amounts to thirty-nine; a large increase. Of these seven died between 30 and 40; twelve between 50 and 60; twelve between 60 and 70; three between 70 and 80; two above 80.

The "Standard" within the first 5 years (1845—1850) numbers four deaths from diseased Kidneys. In the quinquennium following (1850 to 1855) are reckoned the much larger number of fourteen. Dr. Christison ascribes this 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." Probably the same explanation will account for the large increase of this class of deaths in the records of the "Scottish Widows' Fund."

The "North British" records twenty cases of Disease of the Kidney in 37 years (1823—60). The average duration of life after Assurance was 12 years, 3 months. The average expectation 23.57. The percentage on total mortality, 1.53.

6. *Disease of the Bladder.* Only one example 88  
under this section is found in the first 10 years of the

Disease  
of the  
Bladder

“British Empire.” This was an upholsterer who died at 57. The duration of his illness was 7 months according to the death certificate: of the medical attendance 5 months, 10 days. His father had died at 70. His mother was living at the age of 76, at the date when the proposal was made. The case was complicated with Mesenteric Disease of 3 months standing.

In its first 37 years, the “Scottish Widows’ Fund” reckons thirteen deaths under this section. Of these one occurred between 50 and 60 years of age; three between 60 and 70; eight between 70 and 80; one after 80.

Five cases were added to these during the following 7 years (1853—1859). Of these two died between 60 and 70; and three between 70 and 80 years of age.

Within the first quinquennium (1845—50) the “Standard” puts down two cases to this section; and three in the following quinquennium (1850—55).

Disease of the Bladder was the cause of death in twenty cases in 37 years’ experience of the “North British” (1823—60). The average duration of each life after Assurance was 10 years, 7 months. The average expectation, 24.89. The per centage on total mortality, 1.53.

CLASS VIII.—CHILD-BIRTH, AND DISEASES OF THE  
UTERUS.

1. *Child-birth.* Seven cases of death connected with 89  
parturition occurred within the first 10 years of the <sup>Child-</sup>birth  
“British Empire Life Assurance.” As no separate  
account has been kept of the number of female lives  
assured, it is difficult to come to any certain con-  
clusion, as to the ratio of mortality in this section.  
At one time the Directors entertained an impression,  
that it was very much beyond the average ratio.

In its first 37 years the “Scottish Widows’ Fund”  
lost only five lives from Child-birth. Of these, three  
were between 30 and 40 years of age, and two between  
40 and 50. The following septennium gives but one  
death from this cause, which occurred between 20  
and 30.

The “Standard” mentions no deaths from this  
cause in Dr. Christison’s report. Probably they are  
classed under different sections, according as the  
immediate cause of death might have been Hemor-  
rhage, Exhaustion, Fever, or Surgical Injury.

The “British Empire” deaths were distributed in  
the following decennial periods of life. One between  
20 and 30 (ætat. 20), from Puerperal Inflammation.  
The duration of the disease was 12 days. Four  
between 30 and 40. Of the first of these we have a  
history that is both imperfect and improbable; the  
cause of death is described as *Exhaustion* from

*Lactation.* The death of the second was from Hemorrhage. The third was also a case of Hemorrhage from Placenta Prævia. The fourth was a death from Puerperal Fever of 15 days duration. The remaining two deaths occurred between 40 and 50. The first of these (ætat. 40) is said to have died from Hemorrhage, 20 days after the birth of the child; a very unusual occurrence of which the papers afford no explanation. The second (ætat. 42) died 3 days after delivery; but of what cause is not stated. It is worthy of remark that her mother died of Child-birth at 36 years of age.

90  
Per  
centage  
of total  
mortality  
in Life  
Assur-  
ance ex-  
perience

The proportion of deaths from Child-birth to deaths from all causes in both sexes amongst the members of the "Scottish Widows' Fund" is only .26 per cent.\* In the experience of the "British Empire Life Assurance" it amounts to 2.72 per cent. or a little more than ten times as large; the first being a mortality of twenty-six in *ten* thousand: the second a mortality of twenty-seven in *one* thousand.

Two causes may be assigned for this difference in the experience of the two Offices. 1. It may be that a much smaller proportion of female married lives is accepted in the Scotch than in the English Office. 2. It appears to be a well-established fact that the ratio of mortality from certain causes of death varies very widely, not only according to various periods of life, but also according to the *social status* of the individual. Thus it has already been remarked that although from some causes of death, the "British Empire" insurers

\* In the "North British," only a little more, .38 per cent.

have been nearly or totally exempt, yet Phthisis has fallen upon them with great severity. The same explanation probably applies to the great proportionate mortality from Child-birth in the "British Empire" as compared with the "Scottish Widows' Fund."

Some years since I brought this special subject of inquiry under the notice of my friend Mr. Robertson of Manchester; a gentleman, whose experience as an accoucheur amongst the different classes into which society is divided, has been larger than that of almost any other member of the profession; whilst he is also well known by the attention he has given to statistical inquiries. As to the *fact*, namely, the great difference in the mortality of Child-birth according to the rank in life of the individual, he felt no doubt whatever. As to the *proportion*, he stated, not from any paper records, but from the impression that experience had left on his mind, that the lowest mortality was amongst the lower classes of the population, probably not exceeding one in seven hundred or eight hundred:—and the highest mortality amongst that portion of the middle class *who kept only one servant*, probably amounting to one in sixty or seventy.

In Dr. Collins's account of sixteen thousand four hundred and fourteen women delivered in the Dublin Lying-in Hospital, during a period of 7 years, the mortality from all causes was one hundred and sixty-four, or nearly one per cent. (strictly .99 per cent.). This however was the experience of an Hospital, in which the mortality, especially from puerperal fever, greatly exceeds that in private practice. My own recollections of country practice would lead to the

91  
Mr. Robertson's  
opinions

91a  
Dr. Collins's re-  
turns of  
the Dublin  
Lying-in  
Hospital

conclusion that the mortality from all causes connected with parturition is not greater than the lowest ratio of mortality of Mr. Robertson.

92  
Probable  
causes of  
the in-  
creased  
mortality  
in the  
lower por-  
tions of  
the middle  
classes

But if it be enquired why the highest ratio of mortality in Parturition should be met with neither in the higher classes of society, nor in the lowest, but in that section of the middle class designated by the circumstance of "keeping only one servant," it does not appear difficult to find some causes of anxiety and privation which press more heavily on mothers in this class of society than in any other class of the social scale. They are commonly the wives of men whose incomes are *fixed*, such as clerks, assistants, shopmen, and others who have nothing beyond a fixed salary. Expenses from year to year go on increasing, whilst the allowance to the wife for housekeeping remains stationary. Again, the necessity, supposed or real, of keeping up a respectable appearance and position in society, often leads to the sacrifice of domestic comfort, and even of personal health, for the sake of preventing any appearance of coming down in the world. Again, the perpetual anxieties and uncertainties of the future, frequently recurring in wakeful hours of night, even more than amidst the busy occupations of the day, produce a wear and tear of the nervous system, which render it peculiarly susceptible of the risks of Parturition. All this is unknown to those who live only from day to day, and with whom the cares of each day end at its close.

93  
Compari-  
son of the  
mortality

Another mode of illustrating the severity of the mortality from Child-birth, and its accidents in the class of insuring females is by contrasting the per-

centage of the mortality of females from this cause with the total mortality of the sex. Now, of the two hundred and fifty-seven deaths which took place in the "British Empire" in its first decennium, fifty were females, and seven of this fifty, or *fourteen* per cent., were from Child-birth and its attendant accidents and diseases. The ordinary mortality of the sex in general society for the Puerperal portion of life, and for the like period of 10 years, from causes connected with Parturition, would probably not reach *one* per cent.

of the sex  
from all  
causes,  
with mor-  
tality from  
Parturi-  
tion in Life  
Assurance  
experience

What, then, is the practical result of this investigation? Is it that female lives should be excluded from Insurance until they have passed the Puerperal age? This is somewhat difficult without occasioning some discontent both amongst Insurers and Agents. Can any middle course be devised by which a greater portion of the risks from this source may be avoided?

94  
Practical  
results of  
these  
inquiries

Considerable light is thrown upon the solution of this problem by an analysis of the one hundred and sixty-four deaths of the Dublin Lying-in Hospital. Of these eighty-six, or 52.44 per cent. were first pregnancies; and twenty, or 12.19 were second pregnancies, together making 64.63 per cent. It is remarkable that after this the rule seems to be that the ratio of mortality diminishes with each successive pregnancy.

If then these two classes were treated as non-assurable nearly two-thirds of the risk to life arising from Parturition would be avoided. A much less objectionable course, perhaps, would be simply to exclude all the Primipara only, as this would reduce the risk more

95  
Exclusion  
of all  
Primipara

than 50 per cent. Then by continuing the usual surcharge of 1 per cent. for pregnancy at the time of Assurance, the risk might be reduced nearly to the ordinary average.

Only *five* cases of death from Child-birth appear in the 37 years' experience (1823—60) of the "North British." The average duration of life after Assurance was 7 years and 3 months. The average expectation was 33.15 years. The per centage of total mortality, .38.

96  
Diseases  
of the  
Uterus

2. *Diseases of the Uterus.* If we except Cancer of this organ, two deaths from which are included in the "British Empire" list of deaths under that head, see Class II. Sec. 5, then we have no death recorded under this head in our first decennium.

Five deaths from Disease of the Uterus are mentioned within the first 37 years of the "Scottish Widows' Fund." Of these four took place between the ages of 40 and 50; and one between 60 and 70. Within the 7 years following (1853 to 1859) one more occurred, which was from Ovarian Dropsy.

Within the first quinquennium of the "Standard" (1845 to 1850) Dr. Christison reports two cases of death from Diseased Uterus. The following 5 years present four.

Within a period of 37 years (1823—60) the "North British" has met with only one case of death from Disease of the Uterus. The duration of life after Assurance was 10 years, 2 months. The average expectation, 27.61. The average per centage on total mortality, .07.

CLASS IX.—DISEASES OF THE JOINTS.

1. *Rheumatism*. The "British Empire" has one <sup>97</sup> case under this head, occurring in an old gentleman of <sup>Rheumatism</sup> 76. The details are very meagre. He is said to have been ill 3 months; but the medical attendance was only of a week's duration, and we have no information as to the form or seat of the disease: only that for the last 3 weeks of life he was in a condition of great debility.

Five cases are classed under this head within the first 37 years (1815 to 1852) of the "Scottish Widows' Fund." One between 30 and 40 years of age; one between 40 and 50; one between 50 and 60; two between 60 and 70. Within the following 7 years (1853 to 1859) seven deaths from Rheumatism are entered, of which four happened between 40 and 50 years of age; two between 50 and 60; one between 60 and 70.

Two deaths from *Rheumatism* occurred in the last quinquennium of the "Standard" (1850 to 1855).

Only one death from Rheumatism appears in Dr. Burt's records of the "North British." This occurred 10 months after Assurance. The expectation was 25.71 years. The per centage on total mortality, .07.

2. *Diseases of Joints, and Surgical Injuries*. Of <sup>98</sup> the first division of this section the "British Empire" <sup>Diseases of the Joints</sup> has no example. Of the second, there are *three*.

1. Fracture of the leg in an old lady of 70, which was followed by Pyemia. She is said to have been of intemperate habits. 2. Compound Fracture of the Leg, occurring in a wine-cooper aged 51. This is said to have produced Pneumonia, probably also of Pyemic origin. 3. Fracture of the Thigh, in an old gentleman of 78, at which period of life such accidents, even when uncomplicated with Pyemia, or any other positive disease, are often fatal.

Two cases of death from *Diseases of the Joints* occur in the first 37 years (1815 to 1852) of the "Scottish Widows' Fund." One between 30 and 40; and one between 60 and 70. Within the following 7 years (1853 to 1859) we find five deaths under this class, and in addition two from *Disease of the Spine*. Of the former *five*: one occurred between 30 and 40; two between 40 and 50; two between 70 and 80. Of the latter *two*: one happened between 20 and 30; the other between 70 and 80.

The "North British" numbers one case of death from *Disease of a Joint*. The duration of the life after Assurance was 5 years and 5 months. The expectation was 25.09 years. The per centage on total mortality .07.

One case of *Diseased Spine* occurs in the 37 years of the "North British" (1823—60). The duration of life after Assurance was 10 years 8 months. The expectation was 13.82. The per centage on total mortality .07.

No death appears under this heading in the returns of the "Standard."

CLASS X.—DISEASES OF THE INTEGUMENTARY  
SYSTEM; AND SURGICAL DISEASES.

Under this class we have no example in the first decennium of the "British Empire Life Assurance."

Two cases under the section of *Carbuncle* appear in the first 37 years (1815—1852) of the "Scottish Widow's Fund." One between 50 and 60; one between 70 and 80. In the following 7 years (1853 to 1859) none.

Within the last quinquennium of the "Standard," two cases of death from Carbuncle are noted, and one from the effects of amputation.

Carbuncle appears as the cause of three deaths in the records of the "North British." Of these the average duration of life after Assurance was 12 years 7 months. The average expectation 18.06. The per centage on total mortality .23.

CLASS XI.—VIOLENT DEATHS.

Of this class we have eleven examples in the first decennium of the "British Empire." Four between 20 and 30; one between 30 and 40; four between 40 and 50; one between 50 and 60; one between 60 and 70. Six of these were suicides. One of these occurred between 20 and 30; one between 30 and 40; three between 40 and 50; one between 50 and 60. The father of the latter died by suicide at 64.

The modes of suicide chosen were: twice, by hanging (aged 33 and 44); twice by drowning (aged 40 and 55); once, by cut-throat (aged 40); once by pistol-shot (aged 20). In one the verdict was *felo de se*.

Of the remaining Violent Deaths, one was by Railway accident, which occurred to a railway porter, who died the same day. One by falling down stairs, in an old man of 64, who survived but 1 day. One by shipwreck. The other two were by drowning, the first in a young man of 23; the second in a young man of 19.

101  
Suicide

Although it is generally a condition of Life Policies that, in case of suicide, the policy shall become void, yet the effect of this clause is to a large extent illusory. In some cases, not included in the list of suicides, but improperly ranked under some other description, there can be little moral doubt that the death was suicidal, but it was impossible to prove this by legal evidence. In other cases, and this class includes a large proportion of the whole, the policy of insurance has been transferred to other hands, so that the penalty of forfeiture, if enforced, would fall upon an innocent person.\* The only security for the office is to guard against the admission of this class of insurers by adequate surcharges, or by absolute rejection: remembering that the only mode of doing this is by treating the tendency to insanity, as an equivalent of the tendency to suicide. In a vast

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\* The "British Empire" office pays all assigned policies, and others not assigned, if they have been in force a given number of years.

majority of cases suicide is connected with hereditary insanity.

But this is not the only reason why *insanity* should be dreaded as a serious cause of loss to Life Assurance Companies. Its direct operation in producing suicide is much less injurious than are its indirect and collateral relationships. Thus it is often connected with reckless intemperance, reckless depravity, gambling speculations, neglect of all the nearest ties and most important relations of life, neglect of health, insensibility to the inconveniences and dangers of wanton exposure to cold, wet, and other causes of disease and death. A large proportion of the cases of domestic misery, poverty, and premature death that occur in society, might be traced to this origin. To all these considerations should be added yet one of culminating importance to Life Assurance Companies: it is in many cases a correlative of that most rapacious destroyer, Phthisis Pulmonalis.

102  
Indirect  
consequences of  
Insanity  
in  
Families

Nine Violent Deaths occur in the first quinquennium of the "Standard" (1845 to 1850), and twenty in the second quinquennium (1850 to 1855), of which only one is ascribed to Suicide, which was accomplished by hanging.

Sixty-five cases of Violent Death have occurred in 44 years of the history of the "Scottish Widows' Fund" (1815 to 1859). Of these four happened between 20 and 30; eighteen between 30 and 40; eighteen between 40 and 50; twenty-one between 50 and 60; three between 60 and 70; one between 70 and 80. Of these Violent Deaths, six were Suicides. Two by gun-shot wounds; two by hanging; two by drowning.

Forty-five cases of Violent Death are noted in the records of the "North British Life Assurance" in the course of 37 years (1823—60). The average duration of these policies was 8 years 5 months—in this respect presenting an analogy to the brief average duration of the cases of Consumption, namely, 7 years, 11 months.) The average expectation was 28.82, (that of Consumption being 30.64). The per centage on total mortality 3.45.

CLASS XII.—NATURAL DECAY, OLD AGE, CAUSES  
NOT SPECIFIED.

103  
Old Age Of *Old Age* we have one case in the first decennium of the "British Empire." This was an old gentleman of 76, whose death is attributed to this cause only. His father died at 50, it is said of violent cold, and his mother at 70. His brothers and sisters died at 77, 66, and 72.

Under the section of Old Age forty-nine deaths are numbered in the 37 years' history of the "North British" (1823—60), to which allusion has so frequently been made. The average duration of these policies was 17 years and 4 months. Their average expectation was 14.9. The per centage on total mortality, 3.76.

104  
Causes not specified Under the head of *Causes not specified* the "British Empire" has to report only one. This was a farmer who died at the age of 77. In this case the papers had been lost.

In the account of the deaths in the "Scottish Widows' Fund" during the first 37 years (1815 to 1852) appear twenty-seven deaths ascribed to Old Age. Of these twelve were between 70 and 80; and fifteen were beyond 80.

Twenty-eight deaths appear under the head of *Causes not specified*, or not ascertained.

The next 7 years add twenty-nine to the list of deaths from Natural Decay and Old Age. Of these, two occurred between 60 and 70; sixteen between 70 and 80; and eleven beyond this advanced period.

The section of *Causes not ascertained* for this septennium includes only three cases. One occurred between 40 and 50; one between 50 and 60; one between 60 and 70.

Dr. Christison, in his account of the "Standard," reckons under this latter head three cases for the first quinquennium, and six for the second.

Forty deaths are set down to the head of "Causes not ascertained" in the 37 years' history of the "North British" (1823—60). The average duration of these after acceptance was 8 years. Their average expectation was 27.32. The per centage on total mortality 3.06.

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## RESUME.

105  
Resumé  
in brief

Having thus passed through a history of the deaths of the first 10 years of the "British Empire Mutual Life Assurance," classified according to the nosological order observed in the early publications of the Registrar-General for England and Wales; we have, secondly, compared our experience at each step with 37 years' similar history similarly classified of the "Scottish Widows' Fund;" and then, thirdly, with an additional septennium of the same institution. In addition we have taken a like comparative account of the histories of two successive quinquenniums of the "Standard." Then, fourthly, and finally, we have added 37 years' experience of the "North British." These records of the Scottish Companies have been compiled by two of the most industrious and trustworthy medical writers of the present generation, whilst the compiler of the third (the "North British") although not so well known to the English public, has just been raised by his brethren at Edinburgh, to the highest honour they could confer, namely, the Presidency of the Edinburgh College of Physicians. Together, these records present the results of more than 100 years' experience. From this retrospect we may gain a knowledge of the different sources of mortality: and of the proportionate value and importance of each.

Mr. Neison, in his Vital Statistics, expresses his regret that Dr. Begbie and Dr. Christison have failed to supply an important element, which would have added still greater value to their valuable and interesting papers: namely the *Ratio of Mortality*.<sup>106</sup> This, then, with the assistance of our actuary, I have supplied for the first 10 years of the "British Empire Mutual Life Assurance Company;" and the study of it furnished results not less curious and important than those we have inferred from the preceding comparative survey.<sup>†</sup>

The mean ratio of the 10 years is a mortality, from all causes, of 5.77 per thousand. But that ratio is continually oscillating.<sup>107</sup> Thus, in 1849, a year of Cholera and Influenza, it rose to 8.53, and in the next year 1850, it sunk to 2.92. The years 1853 and 1854 were years of increased mortality, which in the latter year was aggravated by another outbreak of Cholera. In 1855 it sunk again to little more than half the year preceding.

At different periods in the age of a Company the per centage of mortality of any given disease will vary according as that disease has a tendency to occur in early life:—or, in other words, to be in the class of early emerging risks.<sup>108</sup> Thus the high per centage of Phthisis will probably be found highest in the first

\* *i.e.*, Not the ratio of each disease to the total number of deaths; but of the latter to the number of lives at risk.

† On the Causes of Death in the "Scottish Widows' Fund" by James Begbie, M.D. F.R.S.E. (Constable: Edinburgh, 1860); a table is added by the Actuary of the Society containing the most precise and detailed information on the number of lives at risk from December, 1852, to December, 1859.

decenniad of each Company; and if it were not for the influx of young lives, would indeed almost disappear after the first 10 years—since it appears from the records of the “North British Insurance” that of one hundred and seven deaths from Phthisis which have occurred in the first 37 years of that Company, the average duration of each policy of this class has been only 7 years and 11 months.

At the end of 37 years, the per centage on the total mortality from Phthisis in the “North British,” remarkably approximates to that at the end of the same period in the history of the “Scottish Widows’ Fund;” being 8.21 in the former Company, and 8.55 in the latter.

109  
Variation  
from un-  
discovered  
causes

From various causes, however, if short periods, such as the successive quinquenniums of a Society, be compared with each other, it will be found, that the rate of increase or decrease is not regular. Thus in the “Scottish Widows’ Fund” while the average rate of 37 years’ mortality from Phthisis was 8.55 per cent. on the total mortality; the next septennium had sunk to 6.07. And in the “Standard,” while the first quinquennium gave 9.39, the second rose to 14.16 per cent.

110  
The ex-  
perience  
of each  
Company  
most  
valuable  
to that  
Company

Probably the history of the “British Empire” will give the truest guide for us, in judging of the relative importance of the risks connected with each disease, and with each individual. The study of our own experience of the *past*, will probably be the most applicable to our class of insurers, and the most correct exponent of our future risks.

111  
Disturb-  
ing agen-

But it may also be observed that these special risks, connected with each disease, are not always the same

in their relative importance, and, therefore, not to be judged rigidly according to the same rule. In this respect they vary in different Assurance Companies; at different periods in the *age* of each Company; in different circles, varying according to the social status in the community; in different districts, varying from causes which are at present obscure. Very numerous instances of this will be found in the very elaborate researches of Dr. E. Headlam Greenhow in his "Papers relating to the Sanitary State of the People of England," presented to Parliament in 1858. In different seasons, varying from the presence of epidemics, or their absence; and, it must also be added, although this category has not yet been noted with sufficient care, that the risks of some diseases, and their mortality, are materially increased by the parents of the proposers being within near relations of consanguinity.

cies numerous, extensive, and varying extensively, in relation to time, place, and other circumstances

Whilst therefore we should, in dealing with our own proposals, coming through the same channels as heretofore, attach a primary value to our own personal experience; yet this judgment ought to be materially modified, according to a comparative estimate taken in connexion with that much larger field of experience which we have gathered in this history from other sources.

## PART II.

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### ELEMENTS WHICH BELONG TO THE CAREFUL

#### ESTIMATE OF EACH LIFE PROPOSAL.

112

History  
of 100  
years of  
Life  
Assu-  
rance  
expe-  
rience

We have gone through the *history* of 101 years' experience of Life Assurance rendered by faithful and trustworthy hands; and next it is our duty to endeavour to extract the *Lessons*, especially those which bear most closely upon the topic placed at the head of the second book; namely, the careful and correct estimate of the class to which each Life Proposal should be assigned; whether in the *first* class, from which no deduction ought to be made in the expectancy of life: or, whether in some lower class, from which it is necessary, in justice to other members, and for securing the commercial vigour and prosperity of the Company, to deduct a sixth, fifth, fourth, third, or even half:—or even to decline the proposal altogether.

It should be borne in mind by proposers who may happen to be ranked in one of these lower classes, that our estimate is in no case to be regarded as an attempt to predict what will be the length of life of any individual. Our estimate should relate to the *average expectancy of the class* to which any individual is assigned; but that average will probably not be true as respects any one individual of that class. Some will be far beyond it, others far below. Just as it is with healthy, so with the different classes of diseased lives, the average is most unequally and uncertainly divided. Life Assurance calculations deal with classes, not with individuals. When therefore individual proposers are disturbed or depressed by a surcharge; it is well that they should be reminded of this great and consolatory truth.

113  
Life  
Assu-  
rance cal-  
culations  
deal with  
classes  
not with  
indi-  
viduals

The data upon which every complete investigation into the quality and value of a Life Proposal must rest, divide themselves chiefly into two principal classes and then into some subsidiary ones. The division which seems to us convenient to follow, is, therefore, the following:—

114  
Classifi-  
cation of  
Facts

- I. The facts of the Family History.
- II. The facts of the Personal History; including those which may be added by a careful personal inspection and examination, by the eye, the hand, the ear, and the mind of the examiner.
- III. The daily occupation and circumstances of the proposer.
- IV. Miscellaneous:—embracing a careful review of the various fallacies which may be connected with the evidences already placed under our view.

115  
Four  
classes

## SECT. I.—THE FACTS OF THE FAMILY HISTORY.

116  
Family  
history

We have placed in the first rank the facts of the family history, because until of late years they have been the most neglected; judged to be of minor importance, and down to the present time, we often meet with cases in which they are utterly ignored; even by men who are intelligent well-educated members of the medical profession; justly sustaining a high reputation in their respective circles. We account for this in part by remembering that the special illustrations of hereditary disease which present themselves in masses to the medical officers of a Life Assurance Company, occur to the ordinary medical practitioner only in individual instances, and at more distant intervals. In part, also, because the conclusions that are forced upon the mind by the study of family history, are often opposed to the wishes, affections, and personal interests, of the student himself.

117  
Analysis  
of sixty-  
seven  
family  
histories

In the history already detailed of the "British Empire Mutual Life Assurance" we have found that sixty-seven deaths occurred from Phthisis. The results of an analysis of the family history of *each individual case* are these:—namely, that these deaths in relation to this question of hereditary descent might be divided into three classes. 1. Those in whom this was more clearly established by the death of one or both parents from Phthisis. 2. Those who might be

classed as *doubtful*, because there was strong ground for suspicion that the fact was essentially the same, but that some different name had been given to the disease; or, it had been hidden under some misleading description; or attributed to some irrelevant incident or accident; or, that it was connected with some correlative disease. 3. Those cases, the history of which *as contained in our papers*, afforded no evidence at all of a suspicious character. Many, no doubt, are found in this class who would have been placed in one of the two former, if there had been placed in our hands evidence which was either forgotten or suppressed;—or, if inquiries had embraced the grand-parents as well as the parents; for it is now generally recognised as a fact, that diseases, like family resemblances, not unfrequently pass over one generation.

To the *first* class, which might fairly be called *hereditary*, belonged twenty-one cases. To the second class, denominated *doubtful*, twenty-three. To the third class twenty-three, in which the evidence of hereditary influence was wanting.

118  
Important facts  
thus disclosed

These three classes make 26.07 per cent. of the whole number of deaths in the first decennium of the "British Empire Mutual Life Assurance;" but, in consequence of their early emergence, they make up 77.25 of our losses, that is, of years deficient of the respective expectancies of these classes. When we moreover consider, that probably not less than two-thirds of these were deaths from inherited disease; we can conceive of hardly any demonstration that could be more impressive than is afforded by these facts of the pre-eminent importance of family history as an

element in the examination and analysis of the value of each Life Proposal.

If then nearly one-fourth of the deaths, in at least the first decennium of a Life Assurance Company, chiefly taken from the middle classes of society, arises from one species of disease; and if, of this fourth, two-thirds are inherited, and probably a large proportion of the remaining third; how important an element in investigating the value of each Life proposed does the history of the Proposer's family become.

119  
Family  
history  
frequently  
the sole  
basis of  
calcula-  
tion

In these cases, and they are not unfrequent, in which the personal history of the Proposer shows an immunity from all disease: in which his present state of health is faultless; in which the muscular system is not only well developed, but associated with more than ordinary power and endurance, but in which the latent inherited tendency, notwithstanding all these important appearances, still slumbers—this element of family history is really the *only one* by which the investigator will be led to form a correct judgment; every other is delusive.

120  
Extraor-  
dinary  
strength  
and endu-  
rance fre-  
quently  
found in  
the early  
life of the  
victims of  
Phthisis

Extraordinary muscular vigour and insusceptibility of fatigue, I have in so many instances observed in those who in after life became the victims of Phthisis, or of some kindred disease, that now these much desired bodily qualities become to me suspicious symptoms, unless the family history of the individual be perfectly free from all taint. A similar observation I found in the excellent Lectures on Consumption by the late Dr. Theophilus Thompson, long after experience had led me to the same conviction.

But when we have arrived at this general conclusion of the importance of considering the hereditary element, another question arises as to the degree of importance which should apply to the case under consideration, according to the similarity of sex. In other words, when the diseased parent is the father, are the sons more likely than the daughters to be attacked? *Vice versa*, the same question applies to the mother.

121  
Greater  
tendency  
of heredi-  
ty to  
follow the  
sex of the  
parent  
affected

The reply to these questions is given in the Report of the Hospital for Consumption at Brompton, 1849, in which we find the following table (pp. 21).

TABLE XV.

“Showing the proportion of Consumptive sons and daughters to Consumptive fathers and mothers respectively.

Sex of Patients	Number of cases	Father Consumptive	Per cent.	Mother Consumptive	Per cent.
Sons . .	106	63	59.4	43	40.6
Daughters	108	47	43.5	61	56.5

Both father and mother were Consumptive in the case of twelve males and ten females. The brothers and sisters in addition to father and mother were Consumptive in four males and six females.

The results here shown are very remarkable. The father transmits Consumptive disease to the sons in

122  
Degree of  
this prefe.

rence of  
the same  
line of sex

59.4 per cent., to the daughters in only 43.5 per cent. The mother to the sons in 40.6 per cent., but to the daughters in 56.5 per cent."

Thus the chances are not far from twice as great in the case of either parent, that the hereditary tendency will descend in the same sex as that of the diseased parent as that it will descend in the other sex.\*

"Results remarkably similar, indeed almost identical, are found in Insanity; as shown in the following table prepared from the last Report of the New York State Lunatic Asylum; the only one in which the facts are given:—

TABLE XVI.

123  
Parallel  
in cases of  
Insanity

Showing the proportion of Insane sons and daughters, to Insane fathers and mothers respectively (from New York Report).

Sex	Number of cases	Father Insane	Per cent.	Mother Insane	Per cent.
Sons . .	117	64	54.6	53	45.3
Daughters	147	67	45.4	80	54.4

Both parents were Insane in the cases of four males and five females."

These tables are very interesting, as they point to the existence of a law, whereby disease, in its transmission from one generation, is influenced by sex, and they give some notion of the degree in which this influence is practically realised.

\* Namely, 100 to 72;—or as 1 to nearly  $\frac{3}{4}$ .

We are at present speaking of the Laws of Heredity in relation to Life Assurance: but it is obvious that, considered in reference to marriage, and the formation of some other social contracts, it is hardly possible to rate too highly their importance, as affecting not one life only, but it may be, beclouding the future of successive generations.

124  
Heredity  
in its  
relations  
to marriage

The *early death of parents* should never be passed over lightly in the perusal of a family history. Imagining a proposer for Life Assurance under consideration, says Dr. A. P. Stewart, "if his parents, though each of a long-lived race, have died early, already a suspicion of some family taint dawns upon one. If, in addition, we find that one, two, three—the majority, perhaps, almost all, of his brothers and sisters have died, suspicion strengthens into certainty. If, still further, it appears that these died, not in infancy, but at various ages between 10 and 35, but especially between 15 and 30, we may almost conclude, without further enquiry, that the disease which has wrought such havoc is Tubercular Consumption." \*

125  
Early  
adult  
deaths,  
especially  
of parents,  
should  
awaken  
suspicion

The most important service that can be rendered by a medical officer to a Life Assurance Company is to avoid risks of early emergence. The number of deaths cannot be lessened, for all must sooner or later die; but it is to keep out those who will die soonest, or at least to make such a surcharge as may be some compensation for the loss occurring from early death. We have already remarked that 26 per cent. of our

126  
Risks of  
early  
emerg-  
ence the  
most to be  
avoided

\* Observations on the Characteristics of Assurable and Non-assurable lives, (p. 41.)

deaths have been caused by Phthisis; but even that large ratio of number, is of far less consequence than the ratio of loss (77 per cent.) arising from the early emergence of this class of risks. This subject receives further illustration, from a very able paper by Dr. John G. M. Burt, Medical Officer to the "North British Insurance Company," in which he gives a table of the Average Duration of Life after Assurance as compared with the average expectation, calculated from the experience of 37 years.\* From this important document, it appears that the average duration of each Consumptive life after Assurance was only 7 years and 11 months: whereas the average expectation of each was 30 years and rather more than 7 months.

127  
Some  
moral as  
well as  
physical  
characters  
are here-  
ditary

But although we have dwelt upon the hereditary tendencies of Phthisis, because of its greater practical importance; yet we must not forget that this destructive disease is only the head of a class. To this class of *hereditary* diseases, which are perhaps all governed by the same general laws, belong Scrofula, Gout, Rheumatism, Gravel, Asthma, Diabetes, Epilepsy, Cancer, and, we must also add—some moral qualities and habits—especially when these are more or less connected with bodily disease: thus, it will often be found in a family history, that some of the children of an intemperate father will fall into the same habits of intemperance. This we have remarked in instances where the son never witnessed the example of the father.

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\* Edinburgh Medical Journal. March, 1862.

Another observation is of importance to Companies who largely deal in *Industrial Assurance*. This is that "Consumption is a disease to which the working and lower orders of society, who constitute so large a proportion of the population, are more liable, in *early life* at all events, than the assuring class. They are exposed to many more exciting causes of the disease, such as cold, exposure, privations, unhealthy occupations, *neglected illnesses*, and, when an hereditary tendency exists, are by no means so favourably circumstanced for employing, or obtaining means to counteract its influence."\*

128  
Liability  
of the in-  
dustrial  
classes es-  
pecially to  
early death  
from  
Phthisis

Another curious and deeply interesting subject of inquiry, which is intimately connected with the study of family history, and its application to the prudent selection of lives for Life Assurance, is that of the *Correlations of Disease*. This subject has been more elaborately treated by the late Dr. C. H. Parry, of Bath (father of Sir E. Parry, the Arctic Navigator) than by any other author within our knowledge. In his volume on General Pathology, these observations will be found, in a section headed, "Additional proofs of one Common Origin of Diseases."† If this generalisation were much less expansive, it would be more correct; and would then convey a more exact idea of what is meant by the Correlations of Disease. If, for example, it were assumed that *some* (certainly not *all*) diseases have a common, or very similar origin, in consequence of which they often become substituted

129  
Correla-  
tions of  
disease

\* Fleming on the Medical Statistics of Life Assurance (p. 37.)

† Elements of Pathology and Therapeutics (p. 368).

for each other, in different branches of the same family:—or, even in the experience of the same individual, at different periods of his life.

130  
Their  
high im-  
portance  
in family  
history

We do not propose here to enter into any enquiry as to the cause of these *Correlations*, but to treat them simply as groups of facts having some reciprocal relationship of high importance in family history: because whenever *one* of these has made its appearance, it indicates a strong probability that *another* of the group will sooner or later appear in the family; and, sometimes in the individual, at another stage of life.

131  
Primary  
and se-  
condary  
correla-  
tions

These *correlated* facts have presented themselves to my observation in groups like the following:—*Primary*, Insanity. *Secondary*, Insanity, Intemperance, Phthisis, Gout, White Swelling. *Primary*, Hæmorrhoids. *Secondary*, Phthisis, Apoplexy, Diseased Liver. *Primary*, Uric Acid Calculus. *Secondary*, Hæmoptysis, Dyspnœa, Mania, Epilepsy. *Primary*, Gout. *Secondary*, Asthma, Calculus, Heart Disease, Dyspepsia, Anasarca. *Primary*, Scrofula. *Secondary*, Hydrocephalus, Ophthalmia, Mesenteric Disease, Spinal Disease, Hip-Joint Disease, Obstinate Ulcerations of various portions of the Skin, Glandular Disease, Phthisis, Cancer.

132  
Early ob-  
servations  
of Dr. C.  
H. Parry

Some of Dr. Parry's groups are as follow:—*Primary*, Mania. *Secondary*, Hæmorrhage, Epilepsy, Headache, Epistaxis, Hydrocephalus. *Primary*, Epilepsy. *Secondary*, Headaches, Hydrocephalus. *Primary*, Headaches and Epistaxis. *Secondary*, Great Irritability, Mania.

133  
Illustra-  
tions from

The following is a family history from observations made at the office of the "British Empire." *Primary*,

a mother died at 49, of Phthisis. *Secondary*, a son at <sup>actual ob-</sup> 32, of White Swelling. A second son at 28, of Apoplexy. A daughter at 19, of Phthisis, following Child-birth. <sup>servation</sup>

From my own personal observations and experience, I add two more groups illustrative of these Correlations of Disease.

*Primary*, a father, after a course of intemperance and extravagance worthy of a madman, died at about <sup>134</sup> 30. *Secondary*, a son, after his arrival at maturity, by folly, extravagance, and intemperance, wasted his estate and his life by 34. An elder daughter died of Phthisis, about 24. A second daughter of Rapid Phthisis following Child-birth, at 21. A third daughter of the same disease, at 19. A fourth at about 17. The first, third, and fourth of the daughters were also of weak mind. <sup>Example</sup>

*Primary*, a mother, after having suffered at different periods of her life from Rheumatism, Bronchitis, Angina Pectoris, and Gout, finally was attacked with Cancer, and died at 70. *Secondary*, a younger sister of this lady died in early life of Phthisis. Her eldest son was attacked with Phthisis. A daughter suffered from Pott's disease, affecting the dorsal vertebræ. Another daughter died at 21, of Phthisis. <sup>Example</sup>

By a careful observation of these correlations of <sup>135</sup> disease, we learn that diseases such as Rheumatism, Gout, Scrofula, and Insanity, which possess no numerical importance in a table of Fatal Diseases in the experience of Life Assurance; may, in their secondary transformations, actually contribute the largest proportion of deaths. <sup>Momentous influence of these transformations of disease</sup>

Still, after the most careful study of family history, we must come to the study of the personal history of the individual. And here I concur with the observation of Dr. Fleming:—"It appears to me that, in the present state of our knowledge, no very general or fixed rule can be adopted, but that every case must be examined carefully on its own specialities, and a deliberate and reflective judgment formed thereon." The points of observation which may aid us in forming this kind of judgment of each individual case, we proceed to consider.

SECT. II.—THE PERSONAL HISTORY.

From the family we pass to the person

1. *Age*. Whether aged risks are on the whole profitable to an Assurance Office, is hardly yet a decided point. My impression, derived from our own experience, would accord with the much larger experience of Dr. Begbie, that, commercially considered, they are unprofitable. 136  
Age

The diseases which experience has shown to be most fatal to the aged, are—Apoplexy and Paralysis; Bronchitis, Pneumonia, and Diseases of the Heart; Diarrhœa and Dysentery—two belonging to the *head*, three to the *chest*, and two to the *abdomen*.

It should be noted whether the general appearance of the examinee agrees with the age stated in the proposal; whether older or younger. The presence of an *arcus senilis*\* is an important test, not exactly of the age, in relation to the number of years an individual *has lived*, but rather of those he is likely *yet to live*. 137  
Arcus Senilis

It might also be well to bear in mind the *climacteric* periods of life, or the periods of commencing decay. These vary much in different persons, and they were accordingly fixed by the ancients as occurring at the 21st, 49th, 63rd, and 81st years of life. It is doubtful whether any importance should be 138  
Climacteric periods

\* *Vide* Canton. On Arcus Senilis. (Hardwicke, Piccadilly).

attached to this precise division and notation; but the general principle is true—namely, that there are periods of incipient decay, and that these may commence in youth, as well as in manhood or in age. The general symptoms are readily caught by an experienced eye—in the loss of energy in the movements; loss of expression in the countenance; loss of weight in the body; loss of the power of endurance, both moral and physical; loss of appetite; flabbiness of the muscles; wrinkling of the skin; loss of memory; loss of interest in surrounding persons and things. No positive disease may be present; but, under these circumstances, diseases apparently trivial prove fatal.

139  
Dangerous periods of life

There are also other periods of life of more than ordinary risk—what may be called the *dangerous periods*. These are the years immediately following puberty, in both sexes—but more especially in the female—when the passions are strong, the reason feeble, the experience fallacious, and the field of observation limited, and the blood impoverished by rapid growth; and these moral and physical defects lead into various forms of disease and early death.

Amongst these, Consumption, or rather *Tuberculosis*, is most prominent. In relation to Phthisis, that rule is not far from the truth that, after 40 years of age, half the danger is over, and it may be added after 50 three fourths. Dr. Christison has stated that, in 98 cases of death after 60, not one was from Consumption. This, however, I cannot but look upon as an exceptional instance; for, in our own Company's experience, seven deaths from Consumption occurred between 60 and 70; and I remember two similar instances in private practice.

*Countenance.* In this there are two very distinct elements—*Complexion* and *Expression*. Although these may be studied separately, in their practical application the two studies are generally joined. Both together form one of the most important combinations of the painter. No one can look upon the faces of Counts Egmont and Horn in the picture of Gallait;\* the countenance of the Dido of Sir Joshua Reynolds; nor upon any of the sketches of the “human face divine,” which adorn the paintings of the first masters, especially those of Correggio, without feeling how intense, minute, and prolonged, must have been the study, which was the prelude to such high artistic excellence.

Such are the qualities of that study which should be bestowed by the physician, for not less important are the relations of the complexion and expression of the countenance to those different conditions of life and health; the prompt recognition of which, constitutes a chief excellence of his art.

The pale, greenish, and sometimes leaden complexion of Chlorosis, Anæmia, or Visceral Disease; the sallow pallor of Cirrhosis, and the semi-jaundiced tint of malignant disease; are all so strongly marked, that it is impossible they should escape notice: but the lighter shades, that cannot be accurately described in words, are those which it is most important for the medical examiner to recognise and appreciate. He may not always know what they mean, but, he is morally certain, they mark some deviation from health,

\* No. 1797, Gallery of the International Exhibition, 1862 (*Belgium*), lent by the town of Tournai.

of which he will endeavour to discover the source, in order to estimate what degree of importance should be assigned to it.

142      It is therefore easy to see how much greater is the  
 Value of a      advantage possessed by the medical examiner, when  
 good posi-      this part of the investigation can be conducted, not  
 tion and a      only in the *day-time*, but also in a *good light*, in a good  
 good light      position, with the face of the person under examina-  
 in diag-      tion turned towards the window. It is by attention to  
 nosis      these apparently little things that the art of Diagnosis  
                  is carried to its highest perfection. It is the putting  
                  together a number of small points of circumstantial  
                  evidence, unknown to the tyro, unremembered by the  
                  man of routine, but ever present to the mind and  
                  memory of the thoughtful and experienced; that  
                  marks the discriminating and specific difference  
                  between a Brodie and a bungler.

143      *Temperance.* The baneful effects of intemperance  
 Temper-      are generally recognised, but they have been set in a  
 ance      more striking light by the exhibition of definite  
                  details, by Mr. Neison.\* From an analysis of his  
                  tables he shows that an intemperate person of the  
                  age of 20, has an equal chance of living 15.6 years  
                  more: while a person of the general population has  
                  an equal chance of living 44.2 years longer. At 30  
                  the expectancy of the intemperate person is only  
                  13.8 years, and the other 36.5 years. At 40, the  
                  chance of the Intemperate is only 11.5 years, and of  
                  the other 28.8 years. Thus it appears that the loss in

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\* "Journal of the Statistical Society, 1851," and in "Neison's Vital Statistics."

the expectancy from Intemperance at the age of 20, is 27.6 years, or 62.4 per cent. At 30 years of age, 22.7 years, or 62.2 per cent. At 40, it is 17.3 years, or 60.07 per cent.

So great is the loss of expectancy in intemperate lives that any considerable number of them would endanger the solvency of any Life Assurance Company. "Where any doubt exists (says Dr. Stephen H. Ward\*) especially in an individual exposed by his occupation to Intemperance, the life should be unhesitatingly declined." "As a rule (says the same writer) reformed drunkards are bad lives."

144  
Great loss  
of 'expect-  
tancy in  
intem-  
perate  
lives

Where the breath is tainted with the smell of spirits, it should raise some suspicion: more especially in the case of those habitual drinkers who have been accustomed to soak themselves daily in alcoholic drinks, until their breath has acquired the smell of an anatomical preparation. But it is more difficult to discover Intemperance in those who never allow the doses taken of the poisonous stimulant to be sufficient either to affect their reason, or to make their speech falter. How, then, may these be detected?

It should excite grave suspicion and enquiry where one of the parents has died intemperate, more so, if that one is the father. There can be no doubt of the existence of a mental disease which has been called *oino-mania*: and as little doubt that this belongs to the hereditary class; probably falling under the same laws as

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\* Medical Estimate of Life, for Life Assurance. Churchill.

any other hereditary disease. This form of Intemperance is generally periodical, and not continual: and frequently, other correlative forms of disease, such as Consumption, Mania, or Epilepsy; will be found in the family history of such individuals.

145  
Social  
Status

*Position in the Social Scale.* We have already shown that Parturition appears to be more fatal in the lower division of the middle classes of Society than in those which are either above or below. Experience also shows the great fatality of Phthisis among the industrial classes; and not only is it more fatal numerically considered; but the fatality occurs at an earlier period of life than in those classes which are better provided with habitations, clothing, sustenance, and the comforts as well as the necessities of life. And it should be carefully remembered that all these observations apply more forcibly to females than to the other sex.

146  
Symmetry

*Symmetry.* This is essential to the perfection of all the higher classes of the animal kingdom: and the absence of it in any part of the body is a mark of some deviation from that well-balanced harmony which bespeaks health and endurance, of both body and mind.

The most important deviations in relation to Life Assurance are those of the Spinal Column. *First*, in proportion as they interfere with the free movements of the heart and lungs. *Second*, as they mark some constitutional vice, such as Scrofula, Syphilis, or Malignant Disease. It is not only that the flexure of the Dorsal Spine interferes with respiration, especially under any diseased condition of the Thoracic Organs;

but when it has arisen from Pott's disease, it marks a condition of the constitution, in which, although the disease may have been for years quiescent, and the patient may seem to have recovered robust health, yet any cause which deteriorates the strength, or general health of the Insurer, will renew the original Spinal Disease, and probably destroy the life of the patient. Experience teaches us to regard all those cases as more or less hazardous, in which, at any former period of life, the *bones of the skeleton* have been the seats of *constitutional disease*.

*Habits.* The most important of these are such as violate the laws of temperance in eating or drinking. Upon these remarks and details of striking weight have already been given under the head of *Temperance*. Another habit is however worthy of some consideration, which has become very prevalent, especially among the young people of the present day, with whom it seems to be looked upon as a sort of manly accomplishment — namely, that of smoking. Thus acquired in youth it becomes a habit which is continued into mature life.

Into the tobacco controversy it is not our intention to enter, but only to note what has passed under our own observation. When every function of the bodily organs appears to be performed in a faultless manner, but the tongue is furred, yet without any other symptom of illness, or even of indigestion, we have almost always found it was attributable to the practice of smoking. In early life this may be the only overt symptom, but in some cases it is accompanied even at that early period with tremulousness of the hands, and

147  
Habits

148  
Smoking,  
its power  
of disturb-  
ing the  
digestive  
organs

disorder of the nervous system. In later life, unless used with great moderation, it produces disorder of the digestive organs, especially that acid digestion, which is so often the accompaniment, perhaps the cause, of Rheumatism, Gout, or Calculus, with their various complications.

149  
It leads  
some-  
times to  
another  
insidious  
habit,  
sipping

Another habit arises in connection with continual or very frequent smoking: the habit of continually sipping small quantities of alcoholic liquids. This, when the smoking is daily and almost continual, the attention being occupied at the same time with conversation or business, leads to the imbibition of an unknown amount of alcohol, and to the production of intemperance in its most insidious and destructive form. Some of the brightest geniuses of our time have suffered fatal injury, from the combined influence of these two habits.

150  
Habits of  
careless-  
ness

*Habits of imprudence* in matters that relate to health and life may sometimes be discovered by apparently trivial indications: *e.g.*, a summer's dress worn in the winter season, by a person beyond the middle period of life, subject to Rheumatism, or to attacks of Bronchitis. One of our most respectable offices, was applied to by one of its insurers, who already held a policy insuring £1,000, to increase that policy by another £1,000. The letter of one of the referees, disclosed a carelessness of the ordinary means for the preservation of his health, upon the part of the insurer, similar to that which has just been described. The office rejected the application. The propriety of this course was manifested a year afterwards. Cholera was epidemic, and this gentleman had premonitory Diarrhœa for 3 or 4

days before he sent to his medical attendant. This was at noon; in the evening Cholera declared itself, and before the early dawn of the next morning he was numbered among the victims of the epidemic.

*Stature and Weight.* In the state of health these always bear a certain proportion to each other: generally restricted within limits which may be so nearly defined, as to enable us to conclude that when they are over passed, in either direction, the body is not in a satisfactory state of health. If disease be not actually present, there is, at least, an increased vulnerability to disease, beyond that which exists in the sound and healthy individual.

The study of these points becomes more important when we consider that loss of weight is often one of the earliest signs of Phthisis. Viewed in this relation, the study of the proportions of stature to weight which are normal; and of the boundary marks at which their variations become indicators of incipient disease; and above all, indicators of that disease, which is the most destructive known to the interests of an Insurance Company; becomes one of the highest duties of the conscientious medical examiner.

The following table was constructed by the late Dr. Hutchinson from observations made on two thousand six hundred and fifty males at the middle period of life: and of thirteen different classes in society.\*

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\* Hutchinson on the Spirometer, p. 56.

153  
Proportions of  
health,  
and their  
utmost  
healthy  
range

Exact Stature.		Mean Weight.			Weight increased by 7 per cent.		
feet	inch.	stones	lbs.	lbs.	stones	lbs.	lbs.
5	1	8	8	or 120	9	2	or 128
5	2	9	0	— 126	9	9	— 135
5	3	9	7	— 133	10	2	— 142
5	4	9	13	— 139	10	9	— 149
5	5	10	2	— 142	10	12	— 152
5	6	10	5	— 145	11	1	— 155
5	7	10	8	— 148	11	4	— 158
5	8	11	1	— 155	11	12	— 166
5	9	11	8	— 162	12	5	— 173
5	10	12	1	— 169	12	13	— 181
5	11	12	6	— 174	13	4	— 186
6	0	12	10	— 178	13	8	— 190

154  
Different  
indica-  
tions of  
slow and  
rapid loss  
of weight

A slow and gradual loss of weight is of more importance in relation to the chances of incipient Phthisis, than a quick and irregular loss. The experienced medical observer associates the latter in his mind with diseases that are often transitory in their nature; in which, if we can wait a while, the danger will be over; or, the patient will be out of the pale of Life Assurance. Of this observation the various forms of Fever present an excellent example. But the former, proceeding slowly and steadily, and presenting an alteration of the general aspect, more readily detected in its accompanying general symptoms, by the eye than even by the balance, should be regarded with grave suspicion. In most cases this slow insidious emaciation is the first indication of the approach of some form of Tuberculous disease.

On the other hand, an increase of weight, beyond the 7 per cent. allowed in the preceding Table, in the direction of corpulency, is an important deviation from the standard of health. The first and most common result is that the abdomen is enlarged, and the proportionate capacity of the chest is in the same ratio diminished. The functions of respiration are, consequently, performed with more or less difficulty. This becomes especially apparent under any circumstances requiring increased exertion; as in any active movements, such as rapid walking, or in ascending a flight or two of stairs, or in going up a hill. As corpulency proceeds towards obesity, it becomes in itself a disease. But, in a lesser degree, it is accompanied with increased susceptibility to formidable disease, and with less vigour and endurance both of body and mind; so that whilst in the corpulent, disease is more easily acquired, it is also with more difficulty overcome. This observation applies almost equally to the three great and important *cavities* of the body, and their contents; namely, to the *cranium*, the *chest*, and the *abdomen*. Hence Apoplexy, Paralysis, Bronchitis, and Fatal (often obscure) Abdominal Disease, are the especial concomitants of excess above the proportionate weight.

Dr. Hutchinson has allowed only from eight to twelve pounds in the 7 per centage of increase upon the minimum weight of his table, which he considers to be within the range of health. Perhaps these limits are rather too narrow; but long observation will, I think, lead to the conclusion, that any considerable deviation from the standard of health, fixed in the

155  
Evil  
effects of  
Corpu-  
lence

155  
Dr.  
Hutchin-  
son's  
limits are,  
perhaps,  
too nar-  
row

table in question, is attended with a proportionate increase of risk and danger to life.

166 *Previous Disease.* In considering the Previous Diseases of a candidate for Life Assurance, we approach a subject which has always been thought an important element in the personal history.

The most important of all these may, therefore, well merit to be put in the first place.

167 *Hæmoptysis.* From the Report of the Consumption Hospital, it appears that this symptom occurs in 61.9 per cent. of males, and in 65.2 per cent. of females, giving a mean of 63 per cent. Andral makes the proportion larger in those who have died of Phthisis under his observation, which he places at five-sixths, or 83.3 per cent.\*

In the second Report of the Hospital for Consumption, it appears that in a total of 5,045 cases of Phthisis, Hæmoptysis had been present in some degree in 4,125. This gives a proportion of 77.46 per cent., which approaches nearer to the estimate of Andral.

In 38.1 per cent. of males, and 34.8 per cent. of females, at the Consumption Hospital, no Hæmoptysis had occurred.

168 In the Report of 1863, just quoted, these proportions are diminished to a mean of 22.54 per cent., for males and females. This class of cases, in which Hæmoptysis is entirely absent, will become less in proportion as the inquiry is extended over the previous years of life. The interval between the first

\* *Clinique Medicale.* Tome II., p. 146. (Bruxelles) (Second Edition).

attack of Hæmoptysis, and the final development and fatal issue in Phthisis, being sometimes separated by several years. I remember one instance in which the first attack of Hæmoptysis took place in 1831, at the age of about 44 years; and death from Phthisis in 1851, or full twenty years afterwards. In about one-twelfth of the whole number of cases, according to this second Report, this symptom had occurred more than two years antecedently to the admission of the patients into the Hospital.

The following table, from the first report of the Consumption Hospital, is interesting in its relations to Life Assurance. Its value is increased by its division into decennial periods.

TABLE (XXIII. IN THE REPORT.)

Showing the existence or non-existence of Hæmoptysis in one thousand and eighty-four cases of Phthisis, *viz.*, males, seven hundred and six; females, three hundred and seventy-eight, arranged according to the sexes in decennial periods. Also the per centage of the cases in which Hæmoptysis occurred.

169  
Proportions of the cases of Hæmoptysis in decennial periods

Age.	Hæmoptysis occurred.		Hæmoptysis did not occur.		Total of cases observed.		Hæmoptysis occurred per cent.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
0 to 5	0	3	2	4	2	7		42.9
5 — 15	7	32	14	9	21	41	33.3	78.0
15 — 25	124	107	85	45	209	152	59.3	70.4
25 — 35	175	59	71	42	246	101	71.1	58.4
45 — 55	29	7	23	8	52	15	55.8	46.7
55 — 65	3	0	10	2	13	2	23.1	
65 — 75	0	0	0	0	0	0		
Totals .	453	243	253	135	706	378	64.2	64.3

170 Greater risks connected with female lives The reflection that immediately occurs to our mind on the inspection of this Table is in relation to the insurance of female lives. The greater part of these come to us for Joint Assurance; and the largest proportion of Joint Assurances are made soon after marriage. Therefore the period of life at which these are made would average from 20 to 25 years of age. Now this is just the period of life in which the cases of Hæmoptysis preceding Phthisis amount to 70 per cent. How great an importance then should be attached to this symptom in the female sex, and at that particular period of life.

171 In what proportion is Hæmoptysis followed by Phthisis? This Table furnishes us with information nearly approaching to accuracy as to the frequency with which Hæmoptysis occurs in Phthisis. Another question, however, arises in connexion with all Life Proposals which contain this ominous symptom in their history: namely, How frequently is Hæmoptysis followed by Phthisis? Or, in other words, How many,

having suffered at some period of their life from Hæmoptysis, will escape its usual sequel, Phthisis, at some future period?

Louis states in his well-known work on Phthisis, that through the course of 15 years, although he had *invariably* enquired in every case submitted to his observation, whether Hæmoptysis had occurred at *any period* of their lives, he had *never* found it unconnected with Phthisis:--except in individuals who had suffered severe Contusions of the chest; or in women whose catamenia had been suddenly suppressed.\*

Andral, in his Clinique Medicale, states from his own experience that one-fifth only of those who have suffered from Hæmoptysis have not been attacked with Pulmonary Tuberculosis.†

Later in life, in his Pathologic Interne, he more positively confirms this statement. "J'ai constate par l'ouverture des corps que plus d'un cinquieme d' Hémoptiques n'étaient pas tuberculeux. D'un autre cote, on voit que des individus qui ont crache du sang dans leur jeunesse ont atteint cependant une grande vieillesse les uns en restant malades et valetudinaires, les autres en recouvrant une santé, parfaite."‡

In a large proportion, however, of these cases in which Hæmoptysis has been fatal without the previous deposition of tubercles in the lung, there can be little doubt that they were true cases of Phthisis in its incipient stage, which would have been ultimately

172  
Almost  
invariable  
connec-  
tion of  
Hæmop-  
tysis with  
Phthisis

\* Louis on Phthisis, p. 67. (Sydenham Society's Edition.)

† Clinique Medicale. Tome II. Troisieme Edition, p. 14.

‡ Pathologic Interne. Second Edition, p. 104.

developed, had the patient escaped death from Hemorrhage. This will be frequently proved, almost demonstrated, by the previous, or subsequent, family history. Thus, I remember an instance in which the elder brother of a small family was seized with Hemorrhage, just after breakfast, in the hall of his house, as he was going out to his daily occupations. He died on the spot, having had no previous illness. Some years afterwards, his younger brother was attacked with Hemorrhage from the lungs. From this he apparently recovered, but not to robust health. In about a year afterwards, he gradually began to decline, until at length he became like a corpse walking; until, at the end of about seven years from the attack of Hæmoptysis, he died of Phthisis.

173  
Illustration

Another striking illustration of the connexion between Hæmoptysis and Phthisis, occurred within my own circle. The second son of a numerous family, apparently in fair health, when on a visit to a relative, was attacked with Hæmoptysis, from which, in about a fortnight, he seemed to recover. After the lapse of a few weeks, he was again attacked, and died suffocated, probably *from* the simultaneous effusion of blood into both lungs. Within the period of about twenty-five years from this death, the third brother, the elder sister, and, lastly, the father, all died of Phthisis.

174  
Those who believed they had escaped generally have not

If Hæmoptysis, then, be so closely connected with Phthisis, even in those instances which seemed to be exceptions to the general rule, the question recurs,—How many escape? For we should hardly think it right to accept any who have once experienced this

symptom, except we believe that in some instances it is totally unconnected with Phthisis; and that, in some other instances in which that tendency actually existed, the period of life has past away at which it might be expected to re-appear. Now this interval between the first attack, and the close in Phthisis, may be long. I have related a notice of a case in which more than twenty years elapsed between the first attack of Hæmoptysis and the death of the same individual from Phthisis, at a period of life when he had reached 64 years of age.

These cases, however, are rare, and no doubt, there may be cases of complete recovery, and even of permanent health, after the occurrence of this dreaded symptom. Yet, it is not surprising, that Medical Officers of Life Assurance Offices should attach to it a very great importance. Thus Dr. Ward says, "When there has been undoubted Hæmoptysis to any extent, especially in an individual exhibiting a strumous tendency either in himself or family, the life must be unconditionally rejected."\* 175  
Dr.  
Ward's  
opinion

Dr. Fleming, in his valuable brochure on the Medical Statistics of Life Assurance, says,† (p. 43), "My experience is unfavourable to applicants, who at any period of their lives have had a decided symptom of disease of the lungs, more particularly spitting of blood, however small the quantity, or however short the duration of the attack. The family history may be unexceptionable; the proposer may, at the time, 176  
Dr.  
Fleming's  
experi-  
ence

\* Ward on Life Assurance, p. 54.

† Medical Statistics of Life Assurance. Glasgow, Murray and Son.

be in average health, but explain it as he may, special plead the causes in the most ingenious manner, some organic lesion, or the seeds of disease, may be there, though even an accomplished stethoscopist cannot detect them. Be not deceived by the specious and plausible opinion, that, had serious disease existed, it would have betrayed itself long ago. It is astonishing for what a length of time the seeds of disease may be dormant in the lungs."

177 Dr. Brinton speaks of Hæmoptysis in the following terms, "A large proportion of the persons who experience this symptom, ultimately die of that pulmonary disease, of which it is well known to be one of the earliest, as well as the most dangerous, symptoms." . . . "It has this termination so frequently, that we are obliged, pitilessly, to exclude every person who has ever suffered from this symptom, from the benefits of Life Assurance."\*

178 In some respects, a private practitioner of some years' standing has an advantage over the hospital physician, or hospital surgeon, when it becomes important to know the history of disease extending over a considerable number of years; and this advantage becomes greater in proportion as the enquiry extends itself to the lives and health histories of collateral branches of the family of the patient. I have therefore endeavoured to recollect what has passed, either in my own experience, or in the experience of others; but under my own observation, during a space of nearly 40 years, of which nearly the first seven were spent in the country, and the

\* On the Medical Selection of Lives for Assurance. By W. BRINTON, M.D. (Churchill), p. 24.

latter part chiefly in town. Many of the patients of the hospital practitioner, especially if he be chiefly known as a consultant, he sees for a brief period, he has never seen them before, and never sees them again. His knowledge of their personal history, is, therefore, very limited, whilst of their family history he knows nothing. On the other hand, the private practitioner sees a much smaller number of cases, but he sees and knows them much more completely, in their antecedents, their collaterals, and their ultimate terminations. Looking back, then, upon the period to which allusion has been made, my recollections would lead me to a conclusion intermediate betwixt that of those who would absolutely exclude every person who had ever suffered from this symptom, and that of those who, professing to regard Hæmoptysis as an important symptom, yet practically treat it as one of no importance, which may have arisen from some temporary affection of the throat, some sponginess of the gums, some sudden or violent muscular effort, or at most some passing Bronchial affection. It is no doubt possible that these explanations, which are so constantly put forward, may now and then (but very occasionally) be true, and the whole of the truth. But in the vast majority, and the exceptional minority is only a fraction, Hæmoptysis is connected with Tuberculosis. Even in those cases which recover, and afterwards pass many years of life in tolerable health, subsequent observation has confirmed my conviction that the primary cause was the same as in those which had a more speedy, fatal issue, and that the difference was one only of *degree*, not of *kind*. After an interval of years, these individuals are for

the most part again attacked, either by some form of Phthisis, or by some correlative disease.

I could not use words expressive of my own experience more precise than those which I have quoted from the celebrated Andral, in a preceding page.

179 *Rheumatism*, a disease of all climates and regions, at one time considered a symptom of little moment in relation to Life Assurance, has of late years been regarded as involving important risks, on account of its varied and ultimately fatal sequelæ. At one time I entertained an opinion, that in those cases in which a patient had passed through a sharp attack of acute Rheumatism without injury, he might generally be considered safe. This opinion has been weakened by subsequent experience, and my present conviction is, that it is not possible to predict what will be the nature of future attacks, from a consideration of the history of the past.

180 In order to form any reliable judgment as to the importance of this disease in the history of an individual; it is necessary, after a careful examination of the heart and its large vessels; of the digestive organs, and the urinary apparatus, to look carefully to the history of his family; to look after not only Rheumatism itself, but for its correlatives, such as Pleurisy, Pericarditis, Rheumatic Gout, and in early life Chorea.

181 Besides the connexion of the Rheumatic diathesis with various forms of inflammatory disease of the serous membranes, and with similar affections of almost every tissue of the body: there is much reason to suspect that it is also related to that state of constitution in which the various forms of fatty degeneration

The study  
of Rheu-  
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should be  
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sive

Is it not  
one of the  
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occur. I remember various instances in which Fatty Degeneration of the Heart was coincident with a history of Rheumatic Disease, which in some cases had left its well-known marks on the joints.

It is hardly half-a-century since the relation between Rheumatism and Inflammatory Disease of the Pericardium and Endocardium was first recognised; and it is only within the last thirty years that it has been universally admitted. The relation between Chorea and Rheumatism has been yet more recently shown by that excellent practical physician, Dr. Begbie.\*

It is as yet but imperfectly known what is the condition antecedent to that disease of the lining membrane of the arteries, which terminates in that further change called Ossification. This seems to begin with fatty deposition† beneath the lining membrane; and it may sometimes be found in all the succeeding stages of commencing change, of complete Ossification, and then of perforation of the lining membrane by the escape of the ossific deposit into the arterial system of the same subject.‡

It is an important enquiry how often these pathological changes are found in connexion with the Rheumatic diathesis. This would lead to the further enquiry whether this relation be one of coincidence

\* Begbie's Contributions to Practical Medicine, p. 68. Also Copeland, in 1821. London: Medical Repository, vol. xv. p. 23; and Bright's Medical Reports, vol. ii., pp. 479—493.

† Hasse's Pathological Anatomy, p. 78. Sydenham Society's Edition.

‡ I can state this from personal observation. But it may be found confirmed in the more elaborate description of Rohitansky. (Pathological Anatomy, vol. 4, pp. 265—7. Sydenham Society's Edition.) A good paper on *Ætheroma*, is also to found in Holmes's Surgery.

182  
Morbid  
relations  
of Rheu-  
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are of  
modern  
discovery

183  
Ossifica-  
tion of  
Arteries

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Heredi-  
tary cha-  
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diseases

merely, or one of causation. The disposition to Fatty Degeneration, of which the early appearance of the *arcus senilis* is a recognised symptom, is, no doubt, hereditary. This must be remembered in our consideration of family histories in connection with Life Assurance, whether its relationship with Rheumatism should hereafter be established or not.

185  
Asthma

When *Asthma* occurs in the personal history of a proposer, it is of course imperatively necessary to be assured that the lungs are free from structural changes. When it occurs in the family history, there are three points in the investigation which claim especial notice. 1. Whether the case mentioned was one of pure *Asthma* without any symptoms of Organic Disease, either of the lungs, or heart? 2. Whether it might not have been Chronic Bronchitis? 3. Whether it might not have been Phthisis, or of Tubercular origin?

186  
Asthma  
should be  
carefully  
disting-  
uished in  
family  
histories  
from  
Phthisis

If a parent is said to have died of *Asthma*, and we also find in the family history that one or two of the children have died of Phthisis, or of some one of its correlations; still more, if the brother or sister of the asthmatic parent has died of Phthisis, or some one of its related diseases; then it is probable, and for the safety of the office, it ought to be assumed, that the parent in question died of Phthisis rather than of *Asthma*.

187  
Diagnosis  
of heredi-  
tary  
Asthma  
from that  
which has  
been  
acquired

The question will sometimes arise, whether the case of *Asthma* under consideration is accidental or hereditary. It will much assist us in forming a sound judgment if we look to the family history, in which, if we find the correlations of *Asthma*, such as Gout,

Gravel, Heart Disease ; even if Asthma does not appear under that name, it is probable that the case is one of hereditary disease.

*Asthma* itself is so varying in degree, not only in 188 relation to the family, but in relation to the patient, The multitude of considerations which enter into the prognosis of Asthma that it becomes expedient, in forming an estimate of the degree of gravity which we should attach to any individual case, to look not only at the fact of the existence of Asthma, but at the frequency, duration, and severity of the attacks. Also, at the *position*, *occupation*, and even the *moral*, as well as the physical constitution of the proposer. If he be in a good position in society, so as to command the comforts and conveniences of life, so as to withdraw from his business at the commencement of an attack, instead of waiting until the spasmodic character has been changed, by exposure, to the inflammatory. If the occupation be one in which it is necessary to breathe a dusty atmosphere, the risk is always most materially increased: sometimes it is produced solely from this cause, in an individual free from hereditary taint; it may therefore be readily conceived how much the risk of Asthma is increased by the trade of a baker or miller. If the dust consist of minute particles of insoluble or crystalline matter, or pointed, or metallic particles, such as in some parts of the process of currying leather—of using mill-stones for grinding, the dressing of flax, and especially the work of fork-grinding, fatal disease is a frequent result. The fatal tendency of the two last occupations, from their influence in irritating and inflaming the Bronchial membrane, is well-known.

189 At first, it might seem too great a refinement in the art of examining, to require the examiner to notice the *moral* as well as the *physical* constitution of the examinee: but it is far otherwise. The great desire for fresh air (*besoin de respirer*), which is present in the paroxysms of difficult breathing, will often lead the asthmatic sufferer to the most reckless exposure of the person. For example, one person mounted on the top of an omnibus, and rode three or four miles in the open air in the depth of winter. Another travelled backwards and forwards from his house in the country, to his house of business, in a foggy morning, on the deck of a river steamer. Another would get out of bed, early in the morning, when the ground was covered with snow, and breathe uncovered at an open window. The first of these died of Pneumonia under 30 years of age. The second of Subacute Bronchitis between 40 and 50. The third of Œdema of the Lungs, and General Dropsy. In the two first instances, the inflammatory attacks were the direct results of the exposure. In the third, the fatal results were more slow, but not less sure.

190 In looking at the *physical* condition of the asthmatic there can be no doubt of the unfavourable influence of corpulency; first, because of the diminution resulting from this cause in the capacity of the chest: and second, because of the diminished power of resistance to all lethal agencies, which is almost invariably associated with obesity at every period of life, but more especially in age.

If it be necessary to look at the physical condition of the body in general, still more is it necessary to

Necessity  
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be assured that there is no structural change in the lungs of the asthmatic.

We may also be helped to form a more correct estimate of the individual, if we look to the family history; and observe, especially if it should include any cases of Asthma, what degree of longevity has been attained, on a general average, as well as in individual cases, in members of the proposer's family. 191  
Weight to be given to the family history

The influence of *Gout* upon the duration of life cannot be rightly estimated by looking at the reports of deaths, either in the lists of the Registrar General, or in the lists of our Life Assurance Offices. From *Gout*, *per se*, no death appears in our first ten years. During the period of 44 years, the Scottish Widows' Fund lost only seven, and the North British Insurance only six in 37 years, making a general average of not so much as four per thousand of the total number of deaths. 192  
Gout, its feeble immediate influence on mortality

It is in its influence in *indirectly* producing fatal results, which appear in our lists of mortality under the names of Apoplexy, Paralysis, Diseased Heart, Diseased Kidney, and Asthma, that we should form a more correct estimate of the fatal tendencies of *Gout*. 193  
Its immense importance in its remote and indirect, or correlative influences

Nor do we arrive at a complete view, until we also reckon the influence of Gouty Dyspepsia, and of the calculous forms of disease, especially those consisting of uric acid formations, in lessening the general powers of the body to resist disease, and to recover from its attacks. Whatever be the form of disease, medical or surgical, the gouty diathesis generally serves to increase its intensity, and to prolong its duration. 194  
Gouty Dyspepsia Calculus.

Sometimes gouty persons reach old age. I can 195

Gout and  
longevity

recollect instances of patients who passed 80 years. These were generally persons of temperate, regular habits, and who suffered from crippled joints of the fingers especially, and from the deposits called chalk-stones. I remember an aged couple who had each of them a pill-box filled with these, which had exuded from their own joints.

It does not, however, always happen that these deposits are harmless. I have known of instances in which suppuration has arisen from their presence, more than once in the ankle-joint, and once in the knee-joint.

196  
Children  
who inhe-  
rit the  
Gout do  
not inherit  
the lon-  
gevity

Nor does it happen that the children of gouty parents who have been long-lived, inherit the longevity as well as the gout. More frequently, I believe, the case is the reverse.

198  
The study  
of the  
prognosis  
in Gout  
very  
complex

How then shall we deal with a case in which Gout—a disease in which the data seem so variable and inconsistent, occurs in the personal history. It hardly seems practicable to lay down any invariable general rule. Probably the most correct course will be, to study each case in itself, and in its family connexions, as if it were a case *sui generis*. In looking at the individual, we should consider the *age* at which the disease began first to show itself, the *frequency of the attacks*, their *severity*, their *continuance*, and especially the presence or absence of any of those indirect results of gouty action on those organs which are essential to the functions of life; *i.e.*, the stomach (especially also its auxiliary, the colon), the lungs, the heart, the kidneys, and the brain, which involve danger to life. In looking at the family history, we should notice

whether the correlatives of Gout such as Asthma, Apoplexy, Paralysis, and Calculus, have often been fatal.

To the study of the *physique*, we must add that of <sup>198</sup> the *morale*. Upon the latter, the dangerous develop-<sup>The morale in Gout</sup>ment of the former will generally depend. Probably the *key* to the exceedingly variable results of Gout in different individuals of apparently similar constitution, and similar circumstances, will be found in the study of the moral, rather than of the purely physical and material relations of the cases under consideration.

The powerful influence of hereditary predisposition is strongly marked in the history of Gout. I have rarely met with instances of Gout in private practice which were not distinctly traceable to this source.

No instance of death from *Calculus* occurred among <sup>199</sup> the insurers of the "British Empire" during the <sup>Calculus</sup>decennium embraced within the statistics of this book. This disease is chiefly important in those diseased accompaniments which are sometimes its forerunners, and sometimes its sequelæ; *e.g.*, Kidney Disease, Asthma, and Gout. (Vide Sec. 89.)

It will always be important in these cases, and in all cases of Disease of the Urinary Organs to *examine the urine*; especially to ascertain its freedom from albumen or sugar.

Amongst the Affections of the Urinary Organs, <sup>Diagnostic importance of the power of retaining the Urine</sup>which ultimately become of great practical importance, is the inability to retain the urine during the night. This is often one of the earliest symptoms of Albuminaria, of Diabetes, or of Disease of the Prostate Gland, or of the Bladder.

200  
Hemorrhoids

*Hemorrhoids*, when attended with frequently recurring losses of blood, even if the Hemorrhages be small in quantity, become a source of considerable risk upon their cessation; apparently by the diversion of the blood to more important parts. Hence it is not unusual to find the sudden cessation of these periodical discharges followed by Paralysis or Apoplexy.

Enquiry should also be made by the examiner as to the cause of this distention of the veins of the rectum:—whether it may arise from obstruction in the liver, in the valves of the large vessels near the heart, or in Hypertrophy of the Heart itself.

201  
Ulcers

*Ulcers* are of importance, as in the case of Piles, only in proportion to the amount of the discharge and the effect that may be produced upon important organs, or upon the general system, when from any cause, a long-continued drain upon the blood is closed.

202  
Pleurisy

*Pleurisy*, when occurring in the personal history presents itself after convalescence under several different aspects. 1. When all the respiratory functions are completely restored, and the sounds of inspiration and expiration are as distinctly heard on the side that was affected as on the sound side. 2. When these sounds are distant or imperfect, but the resonance on percussion remains almost unaltered. 3. When the chest is contracted on the affected side, when the sounds of auscultation and percussion are both materially modified, and when especially *emaciation, increased frequency of the pulse, dyspnœa* on exertion with *movements of the alæ nasi*, on each inspiration, are observable; then we should look at the family history to assist in judging whether or not we have before us the *avant couriers* of Phthisis.

The first of these classes are admissible to insurance, if free from any taint of Pulmonary Disease. The second should be regarded as involving some risk. The third should be declined, or at least delayed, until the unfavourable symptoms have disappeared.

My own experience and observation would incline me to the opinion of Dr. Begbie, that Pleurisy is generally connected either with Rheumatism or Tubercle. 203  
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tion with  
Rheuma-  
tism

*Dropsy.* This will very rarely occur in the personal history of any candidate for Life Assurance. In an experience of 15 years, I do not recollect that any such instance has occurred to me. The only cases in which recovery from this symptom takes place being those which are not associated with Organic Disease of the Liver, Heart, or Kidney. Perhaps the only instances which might give rise to some doubt as to the permanency of recovery from true Dropsy are those which follow Scarlatina; which class probably yields some insurable lives. For although Dropsy connected with Bright's disease, or with Asthma, may for a time, even for an interval of years, disappear; it is almost sure to return; or to be replaced by some other form of fatal disease. 204  
Dropsy

For the Medical Examiner, the most important enquiry connected with Life Assurance concerning Dropsy is, How far it may be considered as an hereditary disease.

The answer to this must be derived from some knowledge, or at least reasonable conjecture, of the nature of the disease of which Dropsy was only a symptom.

(a) When connected with Heart Disease, whether from Rheumatic Inflammation, affecting the interior of that organ:—or, arising from Fatty Degeneration of the muscular substance; in both instances I think it must be considered hereditary. As to the Rheumatic diathesis there can be no doubt. As to the other form, I have so frequently known it affect different members of the same family, that I have as little doubt of its hereditary character.

(b) Dropsy from Morbus Brightii (Renal disease), notwithstanding the great attention which has been bestowed on the subject, both in Great Britain and in France, is, as yet, imperfectly known in relation to this question. It must be reserved for further observation and experience.

(c) Dropsy from Cirrhosis of the Liver, so frequently arising from the abuse of alcoholic drinks, is hardly to be returned in the class of hereditary diseases. On the other hand, when in connection with Malignant Disease, it ought unquestionably to be so regarded.

(d) Except Malignant Disease, there is no other Disease of the Lungs likely to cause Dropsy, but Asthma. The œdematous condition of the ancles in the last stage of Phthisis, is hardly to be called Dropsy. All these conditions, however, come under the category of hereditary disease.

206  
Epilepsy When *Epilepsy* in any of its forms has occurred to a Proposer, it is highly desirable to determine, if possible, with precision,—its *degree* of intensity; its *frequency*; its *influence on the mind*; and its *relations to the family history*.

Epilepsy, in its gravest forms, or, indeed, in any form which has been attended with prolonged unconsciousness, more especially, if to unconsciousness should have been added convulsions, is, in every instance, a disease which may be expected to shorten life.

The *degree of risk* is to be judged of very much by <sup>206</sup> the *frequency* of the attacks. I remember an instance of an Epileptic who attained to 80 years of age, who was at one time a member of the House of Commons, and even in his old age a county magistrate; but in him the attacks occurred not more than once or twice in twelve months. So that if reliable evidence can be obtained that the shortest intervals between the attacks have attained the length of six, twelve, or eighteen months; and that perfect health of body and mind is rapidly regained after each attack, and enjoyed during the interval; it is possible that an Epileptic so privileged, may reach the average duration of life.

But it must be borne in mind that often the <sup>207</sup> evidence which is obtained from a patient subject to Epilepsy is not reliable. The memory of Epileptics is generally treacherous. Then they are very desirous of producing a belief, both in their own minds, and in the minds of others, that the attacks they have experienced have been very few. Another important consideration is, that many attacks, sometimes fatal ones, occur during sleep. Of the attacks that occur in the night the patient has no recollection, so that if he should happen to have no bed-fellow, the attack may be utterly unknown.

When Epilepsy has produced such effects on the

brain, as lead to the permanent weakness, or infirmity of the mental powers, it would not be safe to accept the proposal of any one of this class, on any scale of increased premium.

208 Characteristics of many of the Epileptic class Epileptic patients are very apt to be capricious, eccentric, and sometimes given to intemperance.

These attacks, marked by a great deficiency, or rather absence, of self-control, are important in proportion to the degree of their manifestation, and the frequency of their occurrence. The fits of intemperance are almost invariably followed by aggravated attacks of Epilepsy. All cases of this class should be unconditionally refused admission to Life Assurance.

209 The mild forms easily convertible into the more severe It must also be remembered, that cases of the milder class of this disease, may, by accidental circumstances, involving great anxiety, care, vexation, or irritation, be converted into those of a severer order. I remember a parochial election, in which the opposite candidates were both Epileptics. The attacks of Mr. A. had hitherto been separated by long intervals; but after the election, they were more than doubled in frequency, although he was the successful candidate. With Mr. B., the unsuccessful candidate, the attacks, which, before the contest, had been separated by intervals of two or three months, after the contest, had recurred daily, for nearly a whole week; so as to place his life in extreme jeopardy.

210 Uncertain and generally incurable From these, and other causes, the duration of the life of an Epileptic is always uncertain—because, from circumstances beyond all human foresight, a case, mild in character, and with long intervals of health, may be changed into one of an opposite description, so as to become not only severe, but fatal.

The late Dr. Thomas Davies, of the London Hospital, held the opinion that sooner or later, every case of Idiopathic Epilepsy terminated fatally; except where life was cut still shorter by the intervention of some other fatal disease.

If, on a careful enquiry into the family history, it appears that one or more members have suffered from Epilepsy, the constitutional and hereditary character of any case of the disease so circumstanced, becomes more manifest.

211  
Mode in which it should be studied in connection with the family history

But in the study of the family history, it is necessary to look not only for Epilepsy, but for those correlative diseases which sometimes take its place, such as Diseased Brain, Insanity, and Intemperance.

When *Insanity* makes its appearance in the *personal* history of a proposer, it requires great investigation and consideration. Sometimes that term has been applied to the transitory delirium of fever, which, in a few days passes away, and leaves no trace behind. It may also have been applied to designate some of those lighter shades of mental affection which have little or no tendency to shorten life.

212  
Insanity

When, however, it has been used as the synonyme of Delirium Tremens, it betokens an incurably vicious taste; habits that are generally incorrigible, or one of the forms of dypsomania, from which permanent recoveries, if they ever occur, are so rare, that it is unsafe, upon any terms, to accept a proposal of Life Insurance from any individual of such a class.

213  
Sometimes confounded with Delirium Tremens

It might be thought, by an inexperienced person, that the provision in most Life Policies which makes them void in the case of suicide, would render it safe

214  
Inefficiency of the for-

feiture  
clause to  
protect  
the Office  
from loss  
in case of  
suicide

to deal with these cases of mental disease as with any other order of disease not having a tendency to speedy destruction of life, by means of adequate surcharges upon the annual premiums. From various circumstances, however, this ground of forfeiture becomes inoperative. Sometimes the distress of survivors so powerfully affects the public, that it becomes a question whether it may not become more profitable ultimately to the office, to pay the sum assured, or at least to return all the premiums which have been received, rather than to visit the penalty of suicide upon innocent and suffering survivors. At other times, the policy has been transferred, at its full value at the ordinary market price, when also it is usual to pay the sum insured to the *bona fide* purchaser.\* At other times it becomes difficult, and even impossible, to acquire legal proof that the death has really occurred from suicide and not from accident.

215  
Other  
risks than  
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are con-  
nected  
with  
Insanity

But suicide is not the only risk connected with Insanity. In its latent, or masked forms, it is the cause of reckless speculations, wild and purposeless wanderings from home, fits of prolonged intemperance; dissolute, and diseased associations; and manifestations of unprincipled, and shameless depravity—all which have a tendency not only to shorten life, but to bring it to an early, as well as abrupt termination.

This may be thought strong language, but it surpasses not by a *single shade* the realities of medical experience; and medical experience is larger than any other, because into the ear of the trusted professional friend, relatives pour those sorrowful histories which

\* Generally this is an express stipulation.

they carefully conceal from the world. An instance occurred among our insurers of vile seduction, attempt to murder his victim, and finally suicide. In that case evidence was adduced at the Coroner's Inquest of unquestionable Insanity in two members of the insurer's family, which had been withheld when the proposal to insure was made. And not only withheld, but any tendency to Insanity in the family had been denied. This policy too, had been transferred to another person, so that the Company could not enforce the penalty of forfeiture upon an innocent holder.

*Diseases of the Heart* hold a very important 216  
relation to the risks in Life Assurance; and it is by <sup>Diseases of the Heart.</sup>  
no means always easy to discriminate whether certain symptoms that have occurred in the personal history should be referred to the heart, to some other organ, or to some constitutional disease. Then, if this preliminary be settled, and it appear that some organic change has taken place in the heart, it is not easy to estimate the amount of risk it will probably involve, which experience tells us varies over a wide range, depending upon (a) the amount of local disease; (b) the constitutional power of resistance peculiar to the individual; (c) the circumstances around the man, whether they be such as to allow him to lead a quiet, peaceful and contented life; or, momentous difference! whether their tendencies are directly the reverse.

The *physical* signs of Disease of the Heart, or its 217  
valves, or disease of the great vessels in its vicinity, are <sup>Physical signs, definite and precise</sup>  
so plain, and so distinctive, to the practised auscultator, that hardly one of them can fail to attract the observation of a careful examiner.

218  
General  
symptoms  
often  
obscure

But it is far otherwise with a number of other *general* and *indefinite* signs, which may refer to the heart, or to some other organ, or diseased condition—thus *intermitting pulse* may originate with the heart itself, or be merely a symptom of Dyspepsia; palpitation, with the heart, or merely as an effect of Anemia, or some form of Nervous Disease; *awaking from sleep with a sense of suffocation*, sometimes an important sign of diseased heart, may be merely an effect of *incubus*, which is itself a result of disturbed digestion; *severe pain in the organ itself*, may be a sign of Angina Pectoris, or of Gout, or of Neuralgia. *Dyspnæa* may arise from Anemia, from Asthma, from Age, from Obesity, or from Disease of the Lungs. *Increase of Dyspnæa*, or the *production of pain*, upon ascending a hill, going up stairs, being hurried, or irritated, or upon suddenly changing the position of the body, are important symptoms, but not absolutely pathognomonic of Disease of the Heart.

219  
Disor-  
dered  
action  
some-  
times  
caused by  
irritation  
originat-  
ing else-  
where

Disordered action of the heart, such as violent palpitation, will produce distention of the stomach, with flatulence, nausea, and vomiting. This combination of disordered actions, affecting two such important organs, should always awaken suspicion, and lead to careful investigation, in order to ascertain with which they originate; or indeed, whether the whole of these may not be the reflex symptoms of some other more distant source of irritation.

The hereditary character of Disease of the Heart has already been noticed in some remarks upon Dropsy. (See Sec. 204.)

220

The frequent connection of Diseased Heart with

some form of Rheumatism, especially of Acute Rheumatism as its antecedent, should lead us to look upon with suspicion, and to examine with minute care all those individuals whose personal history has shown a Rheumatic diathesis; the more so, if this has also been manifested in other members of the same family.

Dr. Begbie states that of fifty-three deaths from Disease of the Heart and great vessels, occurring in the experience of the "Scottish Widows' Fund," there were thirteen who had suffered from Acute Rheumatism before acceptance.\* After quoting this statement, Dr. Christison observes that "No rule seems better established than that great circumspection should be observed in accepting proposals of Assurance in the case of individuals, who have either had Acute Rheumatism lately, or who show a great and continuing liability to it, or even when a constitutional tendency to it is proved to exist, by the frequency of its occurrence among the immediate members of their families."

Dr. Christison then relates in detail two very instructive cases, illustrative of the errors that may be committed, even by able and careful men, in ascribing symptoms that denoted Incipient Organic Disease of the Heart, to mere functional disturbances.†

Dr. Begbie remarks, "Disease of the Heart, as a

\* From Dr. Begbie's First Report of the Cause of Death in the "Scottish Widows' Fund," 1815 to 1845 (Monthly Journal of Medical Science. Edinburgh, 1847.)

† An investigation of the Deaths in the "Standard Life Assurance

Means of  
early  
diagnosis  
of Dr.  
Begbie

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 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.”†

History  
of fatal  
cases of  
this complication  
with  
Rheumatism

“Of these victims of Heart Disease (one hundred and twenty-two) 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

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Company” (pp. 26 to 29, by R. Christison, M.D., V.P.R.S.E. Reprinted from the “Monthly Journal of Medical Science,” August, 1853.

† Causes of Death in the “Scottish Widows’ Fund,” from January, 1853 to January, 1860, p. 29. By James Begbie, M.D., F.R.S.E., Physician in Ordinary to the Queen in Scotland. (Constable, Edinburgh.)

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 per centage of death at the successive ages:—

Age at Death.	From all Classes.	From Heart Disease.	Ratio per Cent.
Between 20 & 30 .	33	0	.0
„ 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

222  
Table of mortality from Chronic Disease of the Heart at different epochs of Life

In his Report on the causes of death in the "North British Insurance Company,"\* Dr. John G. M. Burt states that one hundred and twenty-two deaths have occurred, or 9.36 of the total mortality, the whole number of deaths being one thousand three hundred and three (1823 to 1860).

223  
Dr. Burt's statements

He also states the average duration of these lives to have been 12.64, and their average expectation 24.72 years.

During the last septennial period of the "Scottish

224

\* Edinburgh Medical Journal. March, 1862.

Disease of this class of deaths in proportion to the number of aged members

Widows' Fund," Dr. Begbie reports the per centage at  $13\frac{3}{4}$  per cent., which he explains by the advanced age of many of the assured, and from the fact of Chronic Disease of the Heart being, above all others, the disease of old age. The deaths in the "Standard," during the last quinquennium, were a little more than 9 per cent. of the total mortality.

In the case of the first decennium of the "British Empire," the per centage of the total mortality from this class of diseases amounts only to 2.33 per cent.\* The only conclusion to which these varied per centages seem to point is, that as a Life Assurance Society becomes more aged, and consequently contains a greater number of aged members, the ratio of deaths from Disease of the Heart will ordinarily increase. Thus it has been with the "Scottish Widows' Fund," the oldest of the Companies noticed, the per centage of which has been gradually rising to its present amount.

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\* 6 in 257 cases.

SEC. 3.—THE DAILY OCCUPATION AND CIRCUMSTANCES OF THE PROPOSER.

225  
Occupations

The most fatal disease to the insurers of the "British Empire," namely, Phthisis, to which in our first decennium, we owe sixty-seven deaths, spread its ravages over forty different occupations. Of these twenty-three were chiefly carried on in-doors; and the remaining seventeen chiefly in the open air. On classifying these occupations, according to the circumstance of their being carried on *in-doors* or *out-of-doors*, we find that forty-nine, or 73.13 per cent. belong to the former class, and eighteen, or 26.87 per cent. to the latter.

Two grand classes, In-doors, Out-of-doors

These results are quite in accordance with well-known past observations, in showing the unfavourable influence of in-door occupations upon the mortality of Phthisis.

The occupations of female insurers would almost invariably be *in-doors*. The subtraction of the female lives would, in this instance, reduce the mortality of the indoor occupations from 73.13 to 56.72 per cent. of the total mortality from Phthisis.

Almost all the cases of female Life Assurance are made upon the lives of *wives*. Apart from the *moral* objection to this kind of Life Insurance, we see there is also a *commercial* objection, partly from their occupation being in-doors, partly from their greater liability to death from some causes which are not known to the other sex, such as parturition; partly from the greater mortality of parturition and its immediate

226  
Insurance of the lives of wives objectionable on grounds moral and commercial

consequences, upon that class of females who are generally included amongst female insurers.\* Partly, perhaps from the greater sensitiveness and exposure of the married female to coldness, neglect, anxiety, or ill-usage on the part of the husband,—and the larger share which falls to her lot of the labour of watching over infantile diseases, from loss of sleep, and from various sufferings connected with the *res angusti domi* of domestic life.

227 High mortality of this class from Phthisis But, whatever may be the causes, there can be no doubt of the *fact*, that not only the mortality of this class from Phthisis is high, but that it occurs at an earlier period of life than in the other sex, so that it is very doubtful whether joint assurances upon the lives of husband and wife should be at all encouraged.

An illustration of this subject occurs in the Report of the “Christian Mutual Provident Society,” for 1858,† *i.e.*

228 Mr. Neison's calculations as to the relative proportion of female sickness Mr. Neison finds that, “3. While the sickness among females has exceeded the expectation of the tables by 17 per cent., that of males has been less than the tables provided by 17½ per cent., being, on the whole account, a saving of 10 per cent. for the past 5 years. Mr. Neison advises the Board that the future rates of contribution by females for sickness assurances be increased one-fifth, and the Board has adopted the recommendation.”

229 Mr. Nei- In fact, according to this Report, the difference between the relative proportion of sickness between

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\* Vide § 89.

† Post Magazine and Insurance Monitor. September 18, 1858.

males and females in this Friendly Society, amounted to 34.5 per cent. To meet this natural order of events, for being taken from an experience of 5 years, it can hardly be regarded as otherwise than natural and ordinary, Mr. Neison proposed, in the future, to equalize the difference between the sexes by raising the subscriptions of the female members 20 per cent. Can there be so great a difference in the amount of sickness, between males and females *at the adult period of life*, without some proportionate difference also in the amount of respective mortality?

It is a curious, and hitherto unaccountable fact, <sup>230</sup> established by statistics, that under 7 years of age <sup>High mortality of infant life in males</sup> the relative amount of sickness and mortality between the sexes is vastly greater with the male than with the female infants; so that although the number of male births is always greater than that of females, yet, at the end of the period which has been referred to, the proportion of survivors are reversed, the females then considerably predominating over the males. But although this is the case with the early periods of life, it is far otherwise with that period from 20 to 50 years of age, with which Life Assurance Companies have to do; and the preceding facts and observations may give some idea of the degree in which the mortality preponderates on the side of the female, during that section of the whole duration of life.

After the great division of the deaths from Phthisis, <sup>231</sup> according as it was connected with in-door or out-door occupations, we cannot arrive at any trustworthy <sup>Injurious occupations.</sup> results in relation to other occupations, in each of

which, singly considered, our amount of experience has been too small. Still there are some which, as far as the evidence goes, bear out the results of another mode of investigation. These show that the following occupations are less favourable to prevention, at least from this great destroyer, than most other occupations in life, namely: the occupations of tailor, public-house keeper, baker, clerk, butcher, carpenter, schoolmaster, and sculptor. This list, however, rests upon too narrow a basis to be considered as definite or complete.\*

The general principles upon which we may arrange our knowledge of unhealthy occupations will conveniently admit of a classification something like that which follows, namely,—

232 I. External agents acting through the Organs of  
Respiration.

Different  
organs,  
specially  
affected

1. *Dust* arising in the operations of various manufactures.

(a) Of an innocuous character.

Such is the flour which becomes mixed with the air breathed by the workmen in the manufacture of dough.

This although devoid of any acrid poisonous quality becomes injurious by acting as a foreign body, and thus irritating the bronchial membrane.

A fine dust is produced in some of the processes of currying leather. It is less innocent in its nature than

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\* The unhealthiness of the occupations of printers, tailors, and dress-makers *from the hurtful manner in which they are conducted*, is elaborately exposed in the Sixth Report of the Medical Officer of the Privy Council, 1864, pp. 23, 28, 362, 383, and 416.

flour; and will sometimes give rise to Asthma, which I have known to become very severe.

b. Dust generated in like manner in manufacturing processes; and irritating by its mechanical irregularities of form, and its insoluble character. 233  
Flax-dressing

Such are the *spiculæ of flax* given off in the operation of flax-dressing which produce Pulmonary Disease obstinate in its character, and frequently fatal in its ultimate results.

Such also is the dust given off in the *grinding of mill-stones*. This it is obvious is vastly more mischievous when no water is used:—in what is called *dry-grinding*.

The *grinding of metals* is attended by the flying off of minute metallic particles which may be drawn into the lungs in inspiration. The destructive operation of this dust is well known to the fork-grinders of Sheffield. 234  
Grinding

Chaff-cutting, and the bronzing of wall-papers, have been brought under public notice, by Dr. E. Headlam Greenhow, as agents of the class under consideration, injuriously acting on the pulmonary organs, in a series of interesting cases.\*

2. Vapours or gases which are inspired by the respiratory organs in the occupations of life. 235  
Vapour of Alcohol

a. The vapours of alcoholic liquids. This is present in distilleries. The servants in these manufactories are too apt to imbibe the alcohol in a more direct manner than by the lungs; and, therefore, the separate action of the vapour has met with little attention. I remember one instance, in which an old

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\* Medical Times and Gazette. March 12, 1864, pp. 281—282.

servant in a distillery was a water-drinker, yet I once saw him on the verge of Delirium Tremens, and he ultimately died from Dropsy, apparently caused by Cirrhosis of the Liver.

This vapour is also constantly given off at the bar in public houses, hotels, &c., where the various spirituous liquors are sold by retail, and spilt from the over-filling of the glass, or the tremulousness of the hand of the drinker upon the counter. I have often seen the prejudicial effect of this vapour upon the health of females, whose duty it was to attend the bar several hours daily.

236 Vapour of metals *b.* The vapour of metals. Professor Faraday has demonstrated that quicksilver, at the ordinary temperature of the atmosphere, continually gives off a metallic vapour.\* It is probable that all metals in the fluid state do the same. The high temperature requisite to the fluidity of most of the metals would favour the assumption of this form of existence. Gold, one of the heaviest, is no exception, hence a portion of the precious metal, amply sufficient to pay for extraction, is found in the soot of the goldsmith's chimney.

Practically, however, it is the vapour of lead, which is of most importance for the consideration of Life Assurance Companies. This is met with in two forms.

1. The metallic vapour from lead in the state of fusion.

237 Lead, in 2. The vapour of lead dissolved in a volatile liquid, such as oil, or spirits of turpentine, which is given off

\* Faraday's Experimental Researches, p. 57.

freely in that painting process which is called *flatting*.<sup>fusion and in solution</sup>  
 c. Vapours directly poisonous.

Probably all preparations of arsenic used in the arts are capable, at an elevated temperature, of producing arsenical vapours. The poisonous effects of Scheele's green upon those who prepare artificial flowers, painted with this pigment, and upon those who use papers for the walls of dwelling-rooms, which are coloured with the same material, seem to depend less upon the vapour than upon a fine dust which gets scattered through the air, in handling the green artificial leaves of the former, or brushing the surface of the latter.

The poisonous effects of the vapours of phosphorus, 239 which are emitted in the manufacture of matches, and <sup>Phos-phorus</sup> its peculiar property of rendering curious the lower jaw, and other bones of the face, are now well-known.\*

Amongst poisonous vapours must be reckoned the 240 animal exhalations of the human body, from the skin <sup>Animal exhalation</sup> as well as from the respiratory and digestive organs; when these become connected by the crowding of many persons into a small space, as in the celebrated tragedy of the "Black Hole" of Calcutta; or, under many other circumstances, where the same poisonous agencies are present, differing in degree, but not in kind, from those which then gave such a terrific demonstration of their power.

Schoolmasters and schoolmistresses especially, among <sup>In schools and the cottages</sup> the cottages of the poor and working-classes, where

\* Stanley on the Bones, p. 73. And also in the Fifth Report of the Medical Officer of the Privy Council, 1862. pp. 162—206.

and bed-  
rooms of  
the poor

the ceilings are low, the rooms small, and no sufficient provision is made for ventilation, are liable to suffer in health from this cause.

The City Missionary, and the Sunday School Teacher are often exposed to injury from this cause; but in a less degree in proportion as they are exposed to it for a shorter space of time, and with larger intervals of rest, in which they can breathe a purer air.

Still more  
in their  
sickrooms

The sick nurse, and the medical practitioner, are exposed to a class of animal vapours still more noxious in the exhalations arising from the sick, where the most diligent care is not taken to preserve cleanliness, and to keep up free ventilation.

241

Agents  
injurious  
to the  
Organs of  
Digestion

## II. Agents acting upon the Organs of Digestion.

*a. Lead.* We have already spoken of lead when it enters the body by the Respiratory organs. Observation, however, leads us to believe that many cases of lead poison arise from the neglect of a careful ablution of the hands prior to each meal, in consequence of which portions of paint, or of litharge, are habitually swallowed in small quantities.

Great sus-  
ceptibility  
of some  
persons to  
the poison  
of lead

Some persons are very susceptible of the poisonous agency of lead. Therefore we meet with it in the system of those whose occupation, only in an indirect or casual way, brings them into contact with it; as in the case of *gas-fitters*, who often exhibit the blue line on the margin of the gums, which was pointed out first by the late Dr. Burton, of St. Thomas's Hospital, as a sign of the presence of lead in the system. The same thing is sometimes to be observed in *compositors*, from the handling of the printing-types, which are made of an alloy containing lead. In the example of

Diagnos-  
tic value  
of Dr.  
Burton's  
line on  
the gums

the former, the metal enters the stomach by the application of the mouth to the end of the metal pipe to blow through it. In the case of the latter, in the absence of ablution before meals, the metallic particles which adhere to the fingers employed in composing the types, are conveyed to the bread, or other food as it passes through the hands.

*b. Tobacco.* The wonderful power of the human system to accustom itself to the action of poisons, so as by gradual increase to bear a dose which at first would have been fatal, and would be so still, if used by a person who had not undergone this training. I say, this wonderful power of accommodating itself to various lethal agencies, seems to have been the principal cause of the very different opinions that have been held about this plant. 243  
Tobacco

Some of my friends entertain the most decided opinions on the injurious influences of the habitual use of this narcotic. Amongst these are two well-known to the medical profession, and both of them experienced advisers of Life Assurance Companies, I refer to Mr. Solly, the senior surgeon of St. Thomas's Hospital, and to Dr. Cooke, of Trinity Square, examiner to the "Eagle." 244  
Opinions  
of Mr.  
Solly and  
Dr.  
Cooke

The great and increasing use of this plant, will imperatively call attention to its lethal influence when habitually employed, probably, in lessening the duration of life; and in a much larger proportion, in interfering in some with healthy digestion; as is manifest in the furred tongue, the acid stomach, and sometimes the irritated condition of the lining membrane of the fauces, throat, and probably of the pharynx and esophagus.

Some persons consume a considerable daily quantity of tobacco, apparently without injury. Generally I have observed these are persons in the trade, who are in the habit of smoking all day, but then they do so without drinking. No doubt a large portion of the injury to health from habitual smoking, arises from the large additional consumption of alcoholic liquids with which the practice is associated.

245  
Agencies  
interfer-  
ing with  
the func-  
tions of  
the skin

III. Agents acting upon the skin : by suppressing or hindering its usual exertions.

a. Occupations necessarily involving much *exposure to cold and moisture combined* :—as the occupations of pilots, boatmen, wharfingers. These also generally involve some additional risk of accident ; from falls into the water ; bruises from heavy packages, &c. Of late it has been customary to allow pilots to insure without any additional surcharge ; but my strong impression is, that the experience of the “British Empire” is unfavourable to the continuance of that practice.

247  
Exposure  
to sudden  
changes of  
tempera-  
ture

b. Exposure to sudden and considerable changes of temperature when the *body is suffering from fatigue of body, or depression of mind*. This is more especially the case with public speakers ; who, after addressing crowded audiences in a heated atmosphere, using great exertion, and inducing much fatigue of body and mind, go out suddenly into the open air, it may be on a winter's night, weary and perspiring, to travel a considerable distance through rain, snow, or fog, to their home.

248  
Want of  
due ablu-  
tion

c. Want of those general ablutions which are required to keep the skin free not only from foreign

matters, but from those accumulations of its own excretions, which are unfavourable alike to cleanliness and to health. These conditions of the skin are liable to occur to all who neglect entirely the habitual use of water, not only to the face and hands, but to the greater part of the cutaneous surface. How much more then does it apply to those who work in a dusty and heated atmosphere.

d. Occupations which admit of the use of very little clothing. This is especially the case of *puddlers* and *miners*:—also of those who attend to the fires in the engine rooms where steam-engines are kept at work day and night. Independently of the relaxing effects of the heated atmosphere, in which the thermometer sometimes rises to 120 and 130, these men are liable to suffer from the want of some additional protection to modify the grateful change felt when they pass to a cold atmosphere.

249  
Puddlers,  
Miners

#### IV. Restraint as to the position of the body.

##### 1. Long continuance in a standing position.

Madame d'Arblay has given some graphic illustrations of the fatiguing effect of this upon the poor ladies who had the misfortune of being appointed maids of honour to the Queen of George the III. This constitutes one of the chief causes of the unhealthiness of the occupation of linen-draper's shopmen; while as additional circumstances injurious to health, must be considered, the frequent breathing of a close atmosphere in which are a considerable number of gas-burners, deteriorating the air, both by the oxygen they consume; and the carbonic

250  
Long  
confinement to  
the standing  
position

acid, carbonic oxide, and unconsumed gas they give out.

251 Un-natural or unvarying positions 2. Positions which are unnatural, unvarying, or which interfere with the functions of the lungs, or the digestive organs. The positions of the shoe-maker, the boot-maker, the tailor, and of the clerk at his desk, may be taken as examples of these. They are all known to be unfavourable to health, and to this the pallor, or sallowness of the countenance for the most part bears witness.

252 Occupations morally dangerous V. Occupations, which by their frequent associations with temptations to vicious habits, become injurious to health, and even destructive of life.

The inn-keeper, who does not inhale the spirituous vapours which arise from his bar, may, notwithstanding, be tempted to drink too much for the pleasure of his customers. The commercial traveller, whose occupation ought to be one of the most healthy, generally living in the open air, and enjoying the variety of perpetual change of place, has frequently neutralized all these health-giving influences, and made his occupation one of the most destructive to life; by the evil customs of wine and spirit-drinking, with which it has been too generally associated; which have been supposed useful in promoting the traveller's object of getting liberal orders by putting his customer into a favourable disposition, and genial humour.

253 The *bon vivant* So the *bon vivant* without committing himself to gross intemperance or gluttony, may so overcharge the digestive organs, as to render the healthful performance of their assimilative functions imperfect, the production of fat excessive, and the excretory and

eliminative functions imperfect. From these disturbances of function long continued, or frequently repeated, will ultimately arise derangement of structure in the liver, or the kidneys. There is an old adage which says, "Few die of hunger; a hundred thousand of surfeits." This may not be strictly true, yet it contains a wholesome doctrine, the remembrance of which, joined to its practical and habitual observance, would add a fourth, a third, or even more, to the expectancy of lives of this class.

Occupations which materially interfere with sleep, 254  
may be long borne without apparent injury to the general health, especially in the early and middle periods of life; but ultimately the feebleness of the restorative power is revealed upon the occurrence of any shock, moral or physical, by which individuals of this class are readily laid prostrate; and from which they with difficulty recover. Journeymen bakers in London present an example. Also men of other trades, working as journeymen, who endeavour to redeem the idle and intemperate hours of the early part of the week, by working day and night during its closing days. Occupations interfering with sleep

Another kind of habit, perhaps not essentially 255  
vicious, although tending to the production of emotions very far from virtuous, is found in those habits of rivalry, which are cherished in commercial firms where one man is pitted against another daily, and a register is kept of the amount of sales effected by each, to be referred to by the principals, in order to regulate the salary and position of each young man, simply by his efficiency as a money-making machine. Hab. ts of com-mercial rivalry among the young men in large firms

From the constant worry, and incessant vigilance and anxiety attendant upon such arrangements, I have seen life cut short in its prime by functional and organic Disease of the Brain.

In the brief outline of occupations and their influence on health and life which has here been presented, I have chiefly noticed such facts as have come under my own observation; but would recommend those who wish to enter into all the details of a view much more comprehensive and complete, to peruse the excellent work of Thachrah,\* and the more elaborate details of Dr. E. Headlam Greenhow.†

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\* The effect of Arts, Trades, Professions, and Habits of Living on Health and Longevity. By C. Turner Thachrah, Esq. Second Edition. (Longman & Co., 1832.)

† Papers relating to the Sanitary State of the People of England, and the different prevalence of certain Diseases in different Districts of England and Wales. By E. Headlam Greenhow, M.D. (General Board of Health.)

#### IV. MISCELLANEOUS OBSERVATIONS.

First. As to *Fallacies of Description*. These occur in the Life Proposals chiefly, but sometimes also in the letters of referees, and not unfrequently, even in the report of the medical examiner, especially where he is only the reporter of what is told him by the examinee.

1. The first of these fallacies is from *Imperfection*—256  
 from the lack of possibly the most important fact in a Fallacies  
 family history. Thus we have a tolerably complete account of one parent, but the history of the other is reported *unknown*. Yet it is remarkable how often, in the history of a family noted for health and longevity, the infusion of one individual, the subject of Scrofula or Phthisis, introduces a taint which Sup-  
pressive  
veri  
 vitiates the life prospects of almost every descendant from that one. We do not mean that in every one of these, the taint will be *equally* realized; no doubt, in almost all these cases, a portion of the descendants will escape, some of them scot-free; but who can tell which? And so until that certainty of prevision is attained, the element of uncertainty will cleave to all.

Again, a cause of death, frequently assigned is 258  
*Accident*. The *nature* of the accident is not described, Suggestio  
falsi  
 nor the *mode* of its occurrence, and what is more important, the *interval* between the accident and its supposed fatal result, is omitted. Often have I found, upon making inquiry into the nature and history of the accident, that it occurred months, and even years, before the death of which it was supposed to be the

cause. It is perfectly familiar to most of us, that, without wishing to deceive, persons are even unwilling to ascribe Phthisis, Pott's Disease of the Spine, Scrofulous Abscess, or any of these constitutional affections to their true cause, or to call them by their proper names; hence, in private life, as well as in Insurance Proposals, they are described as severe colds, dissipated life, intemperate habits; or, in the case of married females, child-birth.

Flagrant  
misuse of  
the des-  
cription  
"child-  
birth"

In a Life Proposal which lately came under my observation, *three* deaths only had occurred in the family history, all in young women, and each about 25 years of age, and all were ascribed to *child-birth!!* Now, in judging as to the probability (or even possibility) of such a concurrence of misfortunes of the same kind, in one family circle, we will put in juxtaposition with it the attested records of a public Institution. "In the past year, five hundred and eighty-three women have been delivered, of whom two have died." (Report of the City of London Lying-in Hospital, 1863).

Or, in the case of the Surgical Diseases which have been mentioned, these are described as the effects of a blow, a kick, a fall, a sprain, or some other accidental injury, which may, indeed, have occurred, but which of itself, and without the constitutional diathesis previously existing, would have been quite inadequate to the production of any such results.

259  
Mislead-  
ing state-  
ments

2. A second order of fallacies may be called the *Misleading*. Thus it is stated that the life proposed has been accepted at some other office, or offices as a first class life. This is perfectly true, and

yet it is not true that therefore the same life ought to be *now* accepted as a first class life, because some important change may have occurred in the conditions or relations of the case, since that acceptance. The inference intended to be drawn is, that the case is now just the same case it was then, which, on investigation, you will find it is *not*. Since that acceptance, in the *personal* history, Hæmoptysis, or Hæmatemesis, or Acute Rheumatism, or an Epileptic warning, or some other symptom of a dangerous character has occurred, and is set down in the Life Proposal, but then, the respective dates of the acceptance, and of this occurrence are not given. Or, in the *family* history, the death of a brother or sister, or more than one, has happened from Phthisis; or, it may be, the death of a parent, from some form of hereditary disease.

So, when it is represented, and that truly, that some 260  
of the ancestors of a proposer have attained consider-  
able longevity, and the instances have been numerous, Partial  
state-  
ments  
it is still not safe to infer that all their descendants will possess the same tenacity of life. It is curious, and highly important to notice, in the history of families, how the intrusion of one tainted individual disposed to Scrofula or Phthisis, will reduce in many individuals the age of survivancy by 20, 30, or more years, and leave its traces in more than one succeeding generation.

So, also, if the condition, habits, associations, or 261  
employments of the son be very different from those  
of his long-lived parents or relatives; these *external* Long-  
evity of  
parents  
does not  
ensure  
longevity  
in their  
circumstances may have the same effect in shortening  
life as any congenital change in the original constitu-

offspring,  
except  
under like  
circum-  
stances  
and habits

tion of the family from the cause just noticed. Thus we remember a celebrated barrister, of Herculean form and proportions, and apparently of like iron constitution, who was the only son of parents who attained longevity. His father, although a country medical practitioner, attaining 80, and his mother dying at nearly the same age. The son was worn out, and died of one of those forms of disease which are manifestations of *decay*, at the age of 43. The reason for this difference between the parents and the offspring might be found in the contrast between the two parties in these external circumstances of position, habits, associations, and employments.

262  
State-  
ments  
that are  
mislead-  
ing are  
not neces-  
sarily  
fraudulent

When we speak of these *misleading* statements we are fully aware that in most instances those who made them are themselves misled. They would in any other case than that of Life Assurance make just the same statements. They dislike to believe in the existence of any fault either in themselves or in their families; hence, if there be any possible mode of placing it in some more favourable light, they almost unconsciously adopt it.

“All men think all men mortal but themselves.”

263  
Evasive  
modes of  
describ-  
ing  
Phthisis

Thus cases of Phthisis, especially in females, are called death from *severe cold*, from *child-birth*, from *sleeping in a damp bed*, from *disappointment*, from *having had a bad husband*, from *having had too many children*, from *hard work*, from *change of life*, and from *decay*.

Now, in many cases we do not impugn the partial truth of these statements: but still they are *misleading*, because they are statements only of *predisposing* causes,

and not of the *proximate* cause of death. This last is the most important fact, namely, that one which bears the closest relation in time to the ultimate fatal result. For if Phthisis, or any other hereditary disease has been produced, it is of little moment what may have been the predisposing causes, because the disease once produced, no matter how, will reappear in another generation.

3. A third order may be classed under the head of *Evasions*, which are in their practical results Fallacies of Description.

A very common one is that of *changing the name of* 264  
the fatal disease. Thus Pott's Disease appears as death Changing  
from the *effect of an accident*. Some kick, or fall, or the name  
bruise caused in some other way, has probably occurred from the  
in the history of the case, which is, however, merely fatal  
a coincidence, although described as a cause. Phthisis disease to  
appears as Inflammation of the Lungs, or it is called its sup-  
Asthma, from sleeping in a damp bed. *Phthisis* posed  
*Laryngea* appears as Chronic Throat Disease, from cause  
playing on wind instruments.

These modes of speech must be familiar to many, especially to professional men, as evasive modes of describing a common disease, justly dreaded, and justly believed to run in families. Yet, in illustration of the baselessness of these popular fallacies, I may state, that during the whole of my professional life, no such instance has ever occurred under my own observation, as death from sleeping in a damp bed, or from playing on wind instruments, the latter being a healthful exercise, when used in moderation and

unassociated with intemperate habits and habitually late hours.\*

"Died *after* child-birth," is a very common description. "What was the interval between child-birth and death?" was asked in one of these cases, "Eleven years." Another case refuted itself, in which the description was,—"Died *after* child-birth, aged 59." The fatality of child-birth is amazing; it might seem to be the scourge of the sex, if we were to form our judgment *only* from the statements in Life Assurance Proposals.

265  
*Suppressio Veri*

4. A fourth kind of Evasion is the use of the *Suppressio Veri*. Some flagrant instances of this have been brought before us in the case of Lives rejected by other Companies. These have been brought before us with Life Proposals *revised*. On comparing these with the Proposals which had been rejected, we have found some of the most important facts omitted. Such as the fact of Hæmoptysis in the *personal* history; or the fact of the death of a brother, or sister, or of two or more members of the family in a similar near relation, from Phthisis. Sometimes in the more important case of the death of one of the parents, we have found the same suppression of the truth. In one of these rejected proposals, the death of the father of proposer was said to have occurred from Consumption; while in the revised proposal, the same person is said to have died from Accident.

We do not say that cases of wilful *suppressio veri* are common; but they will become still more rare in

\* My able colleague, Dr. Greenhow, has known some cases of Disease of the Heart caused by the immoderate use of wind instruments.

proportion as Life Assurance Companies are true to each other, in affording an opportunity of thus submitting proposers to a cross-examination.

Second. We pass from the Fallacies of Description to what we are inclined to consider as Defects on the part of the Describer. 266  
Defects in the Describer

1. The most prominent of these is the practical *undervaluing* or *ignoring* of the family history. That this should happen on the part of members of the family under consideration is not so surprising, because the wish that such a law of nature as that of hereditary transmission of diseased tendencies should not exist; or at any rate, not in the case of their family; most powerfully warps the judgment. But the most marvellous, and often most vexatious, circumstance in this class of cases is, that the medical attendant of the family, or even the medical adviser of the office, often seems for that occasion to forget or ignore the existence of the laws of heredity. He knows not only in common with mankind in general that likenesses of feature, of character, of habits, pass from the parent to the progeny, often through two or three generations:—but he more familiarly knows that bodily *diseases* to a certain extent obey the same law. He has seen that the disease which was fatal to the parent, is renewed with equal fatality in the child. He moreover knows as a physiologist, and as a student of natural history, that this law of heredity is not peculiar to man; but that it extends more or less to the whole of the animal creation: although more striking in its manifestations as we ascend in the scale of being:—so that the pedigree of the Arabian horse, of the

English race-horse, of the bull of a particular breed, of the ram, and even of the sporting dog, makes the most important element in the estimate of the money-value of each one of these;—and yet he can sometimes, oblivious of all these important points, most important and essential in considering the probable duration of life, put them aside altogether for that time, and ignoring a diseased family history, give an opinion based on the *personal* history of the *individual alone*. We repeat then that to us it is marvellous, and often utterly unaccountable, that a medical man, with all this knowledge not only revealed to him, by his own experience, as well as by the experience of others, but meeting him in his daily walks, and thickly studying all his memories of the past, like the monuments to the dead in some ancient church-yard; should deliberately pass over the whole, as if it were non-existent, and certify of a proposer, in whose family have occurred one, two, or three deaths from hereditary disease, that his life is *unexceptionable*, that it belongs to Class 1.—that practically it is in the same category, and is of equal value with the life of one in whose family no such taint has ever been known.

267  
Neglect  
of the  
correla-  
tions of  
Disease

Another point which comes under the same head of defects in the observer and reporter:—is the neglect of the *correlations* of disease; or the aptness in some groups of diseases to become interchangeable; so that in the members of the same family, the first death shall occur from Phthisis, the second death from Disease of the Vertebræ, the third death from Abscess, and a fourth death from Cancer: these, in the valuation of the life of a fifth member of that family ought to be reckoned as *convertible* terms; instances of what

the late reflective observer, Dr. Parry of Bath, called *Convertible Disease*.\* What was manifested as Phthisis in one became Caries of the Spine in the second, Abscess in the third, and (generally at a later period of life) Cancer in the fourth. The three first, and probably the fourth also, had their *fons et origo* from the same source, namely, Scrofula in the family constitution.

A more striking proof of these groups of correlated diseases is occasionally afforded, when we meet with each, successively developed, at various periods of life in one and the same individual. Thus I have seen the first in such a series to be the formation of Uric Acid Calculus in the Kidney:—the patient becomes convalescent, and is next attacked by Spasmodic Dyspnæa: the next manifestation was Hæmoptysis—then a temporary Paralysis of a Hemiplegic character. Recovering from this, the patient next displayed symptoms of mental disease, which became confirmed Mania, terminating fatally by Epilepsy.

If it be important in the practice of medicine to study these *correlations* of disease (far more important than any nosological arrangements, these correlations being the nosology of nature); then is it at least of equal importance in the valuation of lives for the purposes of a Life Assurance Company, not only to be familiar with the existence of such laws, but to give them their proper weight and application in the uses we make of a proposer's family history.

It would seem to be equally obvious that when both parents die of the same disease, or of diseases which

268  
Correlations exemplified in the same individual history

269  
Great importance of the study of this nosology of nature to the accuracy of all prognosis in relation to Life Assurance

270  
Increased proclivity

\* Elements of Pathology and Therapeutics, pp. 368—398.

to disease  
of which  
the pa-  
rents have  
exhibited  
correla-  
tive ex-  
amples

are correlatives, that then the risk of hereditary transmission is proportionably increased. Yet we have seen cases in which a father has died of Apoplexy and a mother of Paralysis, neither of whom had lived beyond the middle period of life, and yet this double risk of hereditary transmission has been reckoned by the medical examiner as *nil*, and the life of one of their children put down as unexceptionable, Class 1.

271  
Parents  
some-  
times es-  
cape what  
really  
becomes a  
family  
taint

It may however happen that both parents have lived to a fair old age; but *two* or *three* of their children have died at the adult period of Phthisis, or some of its related diseases: \*—in such a case it might seem fair to presume that the hereditary element had not existed but it is very unsafe for an Assurance Company to adopt such an inference, for in the majority of such cases that have come under my observation the policy has become a claim in consequence of death by the family disease, within a few years, generally not more than seven or eight, from the time of its completion.

272  
Atavism,  
Diseased  
germ  
transmit-  
ted from  
the parent,  
some.

It is very probable that some of these examples of hereditary disease not affecting the immediate parents are cases of *Atavism*. In some cases, too, the germ of hereditary disease is first developed in the child, and afterwards in the parent. Thus we have known the

\* In several such cases, Dr. Greenhow remarks, which occur to his memory, one or other parent suffered from Bronchitis or Asthma, *e.g.*—

1. Parents died over 80. All the sons in the prime of life of Phthisis.

2. Father died of Typhus, at 64, Mother at 78. All the daughters, six or seven in number, died of Phthisis.

3. Father died at 86. Mother at 72 or 73. All the daughters and two sons died of Phthisis.

In all these cases, the mother was for years subject to Bronchitis or Asthma.

son die of Diabetes at about 16, whereas in his father the same disease was not developed until after 50, and yet in both it terminated fatally.

times first  
developed  
in the  
child

The practice of making surcharges upon diseased lives, although in relation to the proposer, surely a much milder proceeding than the rejection of the proposal unconditionally; frequently gives rise to grievous discontent on the part of the proposer, apparently more grievous than prompt and absolute rejection. In my judgment it is better never to enter into any discussion as to the reasons, or the propriety of the surcharge in any individual case, either with proposers, or with agents. It is a question which in fact neither the proposer nor the agent is competent to discuss, on account of their very limited knowledge of the natural history of disease; and still more because of the strong influence of those feelings of personal interest which are concerned.

273

Sur-  
charges —  
The im-  
policy of  
discussing  
them with  
interested  
parties

Sometimes, however, a shock is inflicted on the expectations of a proposer, when he finds himself placed below the first class of lives, and this is likely to be more profound when his proposal is totally and absolutely rejected.

274

In cases  
where  
some ex-  
planation  
might  
prevent or  
relieve  
nervous  
shocks:  
the mode  
of repre-  
sentation  
that  
should be  
adopted

Under these circumstances it is both kind and just to explain to the proposer, that every decision of this order, like the general principle of Life Assurance as it applies to all classes, is founded on the doctrine of *Averages*. It is not every one taken in the *first* class that will live up to his expectancy; many will never reach it; some will be found among the early deaths, and some again, may live beyond it. The calculation of expectancy applies to the class as a *whole*, and in

this application it will prove accurate; but it may not prove exact and accurate in relation to any one individual of that class.

Therefore in deducting from the expectancy of an individual life, which for personal or relative causes is marked below the first, or even the second class, whatever that deduction may be, whether an eighth, a sixth, a fourth, or a third, or even half; we do not mean to assert our belief that such a calculation is true of that individual life; it applies only to the class, and it may not be exactly true of any one individual in it. In that third class, as in the first, there may be both long lives and short ones, as in class the first—but the shorter will be more numerous in proportion, and thus the average duration will be lessened.

Even in some cases that have been absolutely and unconditionally rejected on account of the extreme risk and uncertainty of similar lives taken as a class, some have survived the period of risk, and lived not only up to, but beyond the ordinary average expectancy of life.

275  
The relations which exist between a Life Assurance Company and its Medical Informants or Advisers  
Amidst these miscellaneous observations, I would touch upon one of great importance, and yet of considerable delicacy, because it respects the relations existing between a Life Assurance Company and its medical advisers and referees.

Upon the question of fees I do not propose to enter, that may be considered as generally conceded,—but the question of the *position* of the Medical Adviser seems to be less understood. In our Courts of Law there has often been exhibited by our professional brethren the like absence of a due appreciation of

He is a witness,

their true position and duty. In court the medical man is a *witness*, and if he would limit himself to the facts observed and not attempt to be an *advocate* for plaintiff or defendant—if he would be simply a *witness*, and forget that there are other witnesses who have been, or who may be called, whom he regards as *rivals*; then we should have been spared those unseemly contests, in which the interests of truth and justice, the honour and nobility of the profession, and the reputation of the contending parties have all sustained serious injury.\*

In the same manner, but happily in a less degree, the medical adviser of a Life Assurance Company mistakes his true position as their servant *pro hæc vice*, with their retaining fee in his hand, when changing his position as a witness and adviser, he becomes the *advocate* of his patient; and not only so, but when, as sometimes happens, he goes still further, and becoming the *judge*, delivers a judgment condemnatory of the course the Company have from an impartial judgment, directed by conscientious and disinterested advisers, and fortified by a far greater experience than has ever fallen to his lot, in that class of investigations, thought it right to adopt.

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\* Ex. gr. The Trial of Palmer. The Commission de Lunatico enquirendum on Mr. Windham.

277  
Coup d'  
œil

We now close these "Hints on the Selection of Lives," by a glance at the elements which should enter into the investigation of each individual Life.

278  
Family  
History

# I. FAMILY HISTORY,—

*Direct.* Parents. (Grand-parents.)

*Collateral.* Uncles, Aunts, Cousins.

Hereditary Diseases.

Correlative Diseases.

Habits, in relation chiefly to Intemperance.

279  
Personal  
History

# II. PERSONAL HISTORY,—

Age

Age. *Dangerous periods.* Physical. Moral.

Climacteric Disease. Uncertainties of Aged risks.

Marks of  
Decay in  
the organs  
of sense

Marks of Decay.

In the Features. Bagging or Discolouration  
under the Eye.

In the Eye. *Arcus Senilis.*

State of Vision.

In the In-  
telligence

In the Ear. Deafness.

In the Intelligence. Slowness of Perception.

Loss of Memory.

In the  
Muscular  
Motions

In the Muscular Movements. Tremulousness.

Unsteadiness.

Loss of Power.

Counte-  
nance

Countenance. In relation to health.

Symmetry of the right & left sides.

Freedom from pain or anxiety.

Moral Expression.	In relation to Temper.	Expres- sion
	Calmness. } As tending to	
	Benevolence. } promote lon- gevity.	
Temperance.		Tempe- rance
Symmetry of the two halves of the body.		Symme- try
	Right and Left.	
	Face and Trunk.	
General symmetry of developement.		Status
Position in Life.		Weight and
Stature and Weight.	Whether in their health relations to each other?	Stature Habits
Habits.	Whether injurious to health immediately or remotely?	
Occupations.	Out-of-doors, or in-doors? Seden- tary or active?	Occupations
Previous Diseases.		Morbid history

III. THE *tout ensemble* OF THE INDIVIDUAL AS <sup>280</sup>  
GATHERED FROM THE ANALYSIS OF EACH <sup>Tout  
ensemble  
and  
special  
analysis</sup>  
COMPONENT PART OR SYSTEM.

1. Examination of the respiratory system.

a. By the *eye*. Modes of Respiration. <sup>Respira-  
tion</sup>  
Whether any malformation, or  
distortion of Ribs or Spine? .1  
Whether any flattening below  
either of the clavicles?

b. By the *touch*. Applying the hand upon the  
situation of the Posterior  
Lobe to ascertain whether the  
vibrations of the voice can  
easily permeate the Pulmon-  
ary tissues.

c. By the ear. Whether any Abnormal *râles* in Respiration? Inspiration? Expiration?

Of what kind?

Percussion. Whether equal on both sides.

In doubtful cases, Resonance of the voice.

Examination of Larynx and Trachea.

Movements of the Lungs, whether smooth and noiseless, without any friction sounds.

281  
Circulation

## 2. Examination of the *Circulatory* System.

*Quality* of the Blood. Complexion.

Chlorosis. Pallor of the lining of the lips and eyelids.

Dyspnœa on sudden movements, especially in ascending a hill or staircase.

State of the Pericardium. Examined by the ear.  
By percussion.

State of the Heart. In relation to its (a) vigour,  
Pulse (b) rhythm, (c) valvular sounds.

282  
Digestion

## 3. *Digestive* System.

State of the Tongue. Clean or furred? Whether any cicatrix? Any cracks? Any psoriasis or other soreness?

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State of the Stomach. Examined by  
Liver. pressure and by  
Colon. percussion.  
State of the Alvine Functions. Any sign of  
Stricture?

4. Brain and Nervous System. 282  
Nervous  
Systems  
Perfection of the Five Senses.  
Perfection of the muscular movements. Volun-  
tary. Involuntary.  
Average amount of intelligence.

4. Urinary Organs. 284  
Urinary  
Organs  
*Quantity and Quality of Urine.*  
Whether indicating Albumen.  
Sugar.  
Calcareous or other de-  
posits?  
Time of retaining the Urine. In the Night.  
In the Day.  
Whether voided with ease?

6. State of the Skin. To the touch. 285  
Skin  
To the eye.  
Whether any patches of bronzing?  
Eruption?  
Sores?

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286  
Coup d'  
œil of  
heads of  
thought

This is a bird's eye glance at things it is desirable to remember in conducting each examination, yet it is by no means put forth as a perfect epitome. It should rather be compared to the outline of some well-known face; in which the sight of two or three leading features, will serve sufficiently to call to mind all the remaining details.

287  
Thorough  
examina-  
tion need  
not be  
tedious

Nor is it necessary that such an examination should be long and tedious. Several of these particulars may be taken in at a glance. The perfect investigation of one will often involve information that will settle two, or three, or more, besides. Where a question may be requisite, a brief sentence is sufficient, if it be only intelligibly put.

Thus I believe it will be possible to conduct an examination in from twenty to thirty minutes that will embrace every essential detail. When the same ground has been frequently traversed, the facility is much increased by habit; something like the execution of a rapid or complicated piece of music by the fingers of a professor; as compared with the more laboured, lengthened, and halting performance of a beginner.

## APPENDIX.

### A.

On a rule for avoiding Consumption Risks. Dr. Begbie on the Causes of Death in the "Scottish Widows' Fund Life Assurance Company." 1860. Constable: Edinburgh, says,—p. 15.

In two former reports I have entered fully into the subject of the hereditary transmission of Consumption, and its bearings 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 25 years, has been considered 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 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.

The following is an extract from the Report thus referred to:—Dr. Christison. An Investigation of the Deaths in the "Standard Life Assurance Company." Reprinted from the "Monthly Journal of Medical Science," for August, 1853, —pp. 40—43.

The resolution to decline a life, when so many as two of the proposer's immediate family are ascertained to have suf-

ferred from Consumption, is a general rule whose soundness, of course, cannot be tested by the preceding results. Two cases, accepted under such circumstances before the rule was adopted, have been lost during the last 5 years, each of them before reaching the fifth part of their expectation of life. But it is impossible to compare these with the number of similar cases still living.

A single death from Consumption in a proposer's family is not considered of itself a reason for rejection. Nevertheless, the preceding summary shows the necessity of caution even in that case. Four of the deaths present this flaw in the family. And most probably it existed in several others; for, in twelve, I find either no family history, or at least no statement of the causes of death of deceased members.

An evident bar to acceptance in cases of the kind is the occurrence of suspicious symptoms of Pulmonary Disease in the proposer himself earlier in life. This is an objection which can be seldom set aside. One case only presenting it occurs in the list now under consideration. Accepted at 31, when his life seemed to be a fair one, he made another proposal 7 years afterwards, which was also accepted, although he had sustained severe Inflammatory Catarrh 2 years before.

General delicacy, a state of health described as "tolerably good," or "pretty good," or "not robust," a great liability to "slight common colds," or "rheumatic pains," or "bilious complaints," a pulse habitually frequent are all suspicious circumstances in one whose family has suffered at all from Consumption. Among these particulars, I would call attention especially to a liability to Indigestion as a serious ground of doubt, when even only one member of a family has been cut off by Consumption. It is no unusual observation in medical practice that Consumption is preceded by such liability. Either frequent Indigestion favours the development of Consumption in the predisposed by farther impairing a previously doubtful constitution, or simply the two liabilities may be each the direct result of the same constitutional defect. But there can be no doubt of their connection; and the company's experience during the last 5 years illustrates it;

for, in four of the eight cases, which were more or less doubtful risks at acceptance, a liability to Indigestion is noticed in the certificates; and three of these were persons who had each lost one member of their immediate family from Consumption. A habitually frequent pulse is well known to physicians as a dangerous peculiarity in a member of a Consumptive family. One of the deaths from Consumption occurred in a person of this peculiarity, who had lost a cousin from the disease, and two adult brothers from unstated causes. Other grounds of doubt, or positive bars to acceptance, might be suggested as affecting proposals in cases of one death from Consumption in a family. But I must confine myself to those now mentioned, as being the only ones receiving illustration from the present scrutiny.

Since adopting the general rule to decline lives when two members of the family have died of Consumption, the directors have repeatedly had to consider whether the rule might be safely departed from in special cases under favourable conditions. The experience of the company supplies satisfactory information in regard to one of these conditions, namely, the advanced age of the proposer.

According to some late notices on the Medical Statistics of life assurance, the notion long generally entertained, that subsequent to adult age, the proportion of deaths from Consumption diminishes with the advance of life, and becomes very small after 45 or 50, is not borne out by facts, and is therefore an unsafe principle to follow in regulating the acceptance of proposals of assurance. \* \* \* \*

In London, in 1845, 3,624 males died of this disease, of whom 2,599 were above 20 years of age; and of the latter number 21.3 per cent. were between 41 and 50 inclusive, 10.6 between 51 and 60, and 4.2 above 50; that is, 36 per cent. in all after 40, and even 15 per cent. after 50. These are large proportions, especially if compared with the total existing population above those ages, which is, of course, considerably less than at earlier periods of life.\*

The statistics of the Royal Infirmary of Edinburgh, which

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\* Eight and Ninth Annual Reports of the Registrars-General,

are probably as accurate upon this point as it is practicable to render them, yield a result somewhat different, yet in the main concordant. It appears, that in 11 years prior to October 1850, eight hundred and fifty-two cases were recognised as cases of Consumption among the male patients, and seven hundred and fifteen were above 20 years of age.\* Of the latter 17.8 per cent were between 41 and 50, 5.6 between 51 and 60, and 2.4 above 60: that is, 25.8 per cent. in all were above 40, and 8.0 per cent. above 50. The deaths from the same cause in both sexes yield almost exactly the same results. Of six hundred and ninety-eight deaths, six hundred and eleven were above 20, and of these 17 per cent. were between 41 and 50, 5.5 between 51 and 60, and 2.3 above 60; that is 24.8 in all were above 40, and 7.8 per cent. above 50. Even these numbers, inferior as they are to those deduced from the London mortality returns, indicate a proportion of deaths from Consumption after middle life at variance with preconceived notions, and with the principles adopted by most assurance companies in disposing of proposals of assurance made by parties above the ages of 40 and 50.

The information supplied by assurance companies themselves is apparently to the same effect. In the experience of the "Equitable Society" of London, the proportion of deaths from Consumption after middle life, is represented to be most formidable; for among three hundred and thirty-nine deaths from that cause after the age of 20, it is stated that 24.5 per cent. occurred between 41 and 50, 24 between 51 and 60, and 25.0 above 60—that is, 73.5 per cent. after 40, and even 49 per

\* STATISTICS OF CONSUMPTION AMONG MALES ABOVE TWENTY.

Ages.	Deaths in London in 1845		Infirmary Cases 1839-50.		Infirmary Deaths in both Sexes.		Deaths in Equitable.		Deaths in Scottish Widows'.		Deaths in Standard.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
21 to 30	841	32.5	332	46.4	288	47.2	27	8.0	9	12.5	1	3.4
31 „ 40	810	31.4	199	27.8	171	28.0	63	18.5	35	48.6	16	55.1
41 „ 50	552	21.3	127	17.8	104	17.0	83	24.5	16	22.2	4	13.8
51 „ 60	276	10.6	40	5.6	34	5.5	81	24.0	7	9.7	6	20.7
61 and older	110	4.2	17	2.4	14	2.3	85	25.0	5	7.0	2	7.0
Total above 20	2589	100.0	715	100.0	611	100.0	339	100.0	72	100.0	29	100.0

cent after 50. Great errors must have crept into the data which supply such results. A much nearer approximation to the truth has been supplied by Dr. Begbie from the experience of the "Scottish Widows' Society." Of seventy-two deaths from Consumption after the age of 20, 22.2 per cent. occurred between 41 and 50, 9.7 between 51 and 60, and 7.0 above 60—that is, 38.9 per cent. above 40, and 16.7 above 50. The experience of the "Standard Life Assurance Company," during the last 3 years, is to the same purport. Of twenty-nine deaths from Consumption, 13.8 per cent. occurred between 41 and 50, 20.7 between 51 and 60, and 7 above 60—that is, 41.5 per cent. occurred above 40, and 27.7 above 50. The inferior proportion occurring between 41 and 50, compared with that in the next 10 years of life, and consequently the apparently high per centage above 50 are results evidently owing to the accidental grouping of cases in observations made on a limited scale.

Notwithstanding considerable discrepancies in the details now referred to, there is sufficient correspondence among the facts as a whole to satisfy any one, that Consumption is far from being so infrequent after middle life, or even in advanced age, as had been until lately supposed. But it does not absolutely follow, that ignorance of the general fact has hitherto occasioned any material loss to assurance companies, or that the knowledge now possessed of the frequency of Consumption after middle age should inculcate for the future more stringent principles, or greater caution in applying the old ones, than what have been observed for some time past by this and other companies, in accepting lives after middle age when visibly liable in some degree to the risk of Consumption.

When a man has reached the age of 40, and still more 50, the value of his life is much more easily judged of than at ages considerably earlier. His habits, the influence of occupation, his personal liability to disease, the constitutional infirmities of his family, and other less important circumstances, are in general developed by that time and easily ascertained. Hence a large proportion of indifferent lives, proposed for assurance about middle age and afterwards, may be at once set aside as hazardous with very ordinary care. These swell

the lists of deaths from Consumption later in life in the general population. But they are too easily shunned in the practice of assurance companies, to form an element of inquiry as to the necessity of reforming that practice. Looking then to the operations of a company from this position, it is plain, that in adopting rules for the future, we have to revise a class of facts very different from those presented by a survey of the general population of a country. These rules are not to be based, as some will insist, on the frequency of Consumption after middle life in any ordinary class of lives in a community. The only correct guide is its frequency among lives *accepted after middle life* under the present practice; according to which continued immunity until middle life from Consumptive symptoms and other diseases of the Scrofulous constitution, is held to be one favourable circumstance of no little amount in the case of a proposer of assurance who is of a somewhat Consumptive family.

I am not acquainted with any published data which will supply available information on this point. But the experience of the "Standard Life Assurance Company" during the last 5 years—too limited, it is true, to yield absolute results—is satisfactory so far as it goes. Thus, among lives accepted under the age of 40, one hundred and four have died of all diseases, and nineteen of these from Consumption—that is 18.27 per cent. But among lives accepted after 40, of which one hundred and eighty-seven have been cut off by diseases of all kinds, only ten have been cut off by Consumption, or 5.2 per cent. Of lives accepted after 50, one hundred and twenty-two have died, and only three of Consumption, or 2.43 per cent. Of lives assured above 55, eighty-five have died, and only one of Consumption, or 1.2 per cent. And among lives accepted after 60, fifty-three have died without a single death from Consumption. These remarkable results certainly go far to show, that, whatever may be the frequency of Consumption in the general population after middle life, it becomes progressively a less frequent proportional cause of death among lives accepted for assurance at a later and later period of life—that the risk from it is not great after 40, very small after 50, and quite insignificant after 55—that, therefore, great and in-

creasing facilities must exist for escaping Consumptive risks proposed after middle age—and that greater stringency than is now observed by the directors in accepting lives after that period of life, is scarcely required, so far as the fear of Consumption is concerned.

B.

Correlation of Phthisis with the Strumous Diathesis, and with Malignant Disease. Dr. Christison's Report on the Deaths in the "Standard Life Assurance Company." (Private, for Medical Men) pp. 19—21.

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 seven hundred and seventeen deaths during the last 10 years among those assured in the "Standard Assurance Company," no fewer than four hundred and twenty-six happened among persons assured for the first time after the age of 40. Death from Malignant Diseases is also frequent—more so than may appear either from the statistical returns of Assurance Companies, or from the mortality table 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 10 years. But the majority of deaths referred in the Table to Disease of the Stomach and Disease of the Uterus, twenty-four in number, have also undoubtedly arisen from malignant affections of these organs. Another addition may be confidently made of a fair proportion of thirty-three 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 forty-six 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 degeneration 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 40.

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 one hundred and ninety-two 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 affects 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 in 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 six hundred and fifty-seven inspections there are only twenty-eight 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 referable 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 constitu-

tional 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 tolerable sound state of health, the family constitutional tainting 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 Diseases of Malignant Type.

Dr. Christison's Investigation of the Deaths in the  
"Standard Life Assurance Company,"—p. 37.

A variety of facts in ordinary professional experience, as well as observation in Assurance inquiries have led me to the conclusion, that Malignant Diseases are part of the unfortunate heritage of the Strumous constitution. Hence, in judging of the influence of family history, I am strongly inclined to think that Malignant Diseases on the one hand, and Consumption, Tabes, and the like on the other, may be regarded as equivalent.

### C.

On the Age of the Company in influencing the Ratio of Mortality from Phthisis. Dr. Begbie, Causes of Death in the "Scottish Widows' Fund,"—p. 14.

Among the Diseases of the Respiratory Organs, there is, during the last septennial period, a slight increase of mortality. During the former period, one hundred and twenty-nine deaths, or  $18\frac{3}{4}$  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  $23\frac{3}{4}$  per cent. On the present occasion, one hundred

and ninety-six 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 seventy-two out of six hundred and forty-two deaths, or nearly  $11\frac{1}{4}$  per cent. of the gross mortality; in the last investigation it accounted for forty-two out of six hundred and ninety deaths, or 6 per cent. of the mortality; and, in the present scrutiny, we find sixty-six out of nine hundred and seventy-five deaths, or  $6\frac{3}{4}$  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.

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.

#### D.

Practical Deductions as to the average proportion of  
Proposals to be declined as under average risks.  
Dr. Christison's Report on the Deaths in the  
"Standard Life Assurance Company."—pp. 16.

The practical deductions to be drawn from the facts as to the history of the families of six hundred and ninety-eight proposers to the Standard Assurance Company, are the following:—

1. In the 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 twenty-nine families in which at least two cases of Consumption have occurred, there have been thirteen in which at least one other death has occurred from the same cause. In the whole twenty-nine families there had been eighty-four deaths from Consumption, or almost three on an average in each. In sixteen families there had been two; in five, three; in two, four; in three, five; and in one, 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 twenty-nine cases,\* it

\* 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 Consumption before 27, and only sister of an unstated 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 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. Had 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

appears that in fifteen there were both personal and other family objections, besides merely the two Consumptive deaths ; that in ten there were only additional, but important, family

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 diarrhœa, 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.*

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 seventeen professions supply each only one case, and seven only two each. There are three butchers—a fact, 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.

### E.

Illustrations of the severity with which Phthisis falls upon some portions of the Industrial Classes.  
Sixth Report of the Medical Officer of the Privy Council. 1864.—pp. 29.

So far as printers, tailors, and dressmakers are concerned, the appendices of my present report contain evidence which will, I think, be deemed sufficient to justify the opinion which I express. And lest the urgency of their case should be undervalued, I here insert a table (for the figures in which I am indebted to the Registrar General) showing the excessive mortality of London printers and London tailors as compared with the healthy standard of agricultural industry. I have no such statistics with regard to dressmakers; nor can I, as regards any special industry, give death-rates calculated like the district death-rates in the last preceding table for the one particular fatality of lung-disease. But Dr. Smith's report tells, both for printers and for tailors, that Phthisis and other lung-diseases are notoriously in vast excess. He finds reason to believe that among the printers of London, Phthisis, in proportion to other diseases, is twice as prevalent as even among the general male population of London. He finds, also, that among tailors "consumption and other forms of chest-disease

constitute two-thirds of all the causes of death." And the annexed table shows the effect of those diseases in swelling the general death-rate of each occupation. It will be seen that, at the age of thirty-five to forty-five, the mortality of London tailors is fifty-seven per cent. higher, and the mortality of London printers more than one hundred and seven-

Number of Persons of all ages employed in the Industries respectively.	Industries to be compared as to their effects on health.	Death rate per 100,000 men employed in the respective industries at the under-mentioned ages.		
		25-35.	35-45.	45-55.
958,265	{ Agriculture throughout England and Wales.	743	805	1,145
22,301 men. 12,377 women.	{ London tailors	958	1,262	2,093
13,803	London printers	894	1,747	2,367

N.B.—It is probable that at the age of twenty-five to thirty-five the mortality of tailors and printers in London is greater than that represented in the first of the above columns of figures. For in both industries, London employers receive from the country large numbers of youths and young adults (probably up to thirty years of age) as apprentices and "improvers." These young men are of course counted in the census as London tailors and London printers respectively. But while their presence thus swells the *number of hands* on which the London industrial death-rates have to be reckoned, it probably does not contribute in anything like the same proportion to the *number of deaths* in London. For the stay of those young men in London is, under any circumstances, only meant to be temporary; and if, during this time, they are attacked in London by serious chronic disease (such as Phthisis) they probably return to their country homes, where, if they die, their deaths would be registered.

This influence affects still more the earlier ages, and renders the London death-rates for those ages quite valueless as measures of the industrial insalubrity. For instance, the death-rate of London tailors at the age of twenty to twenty-five is represented to be less than that of the agricultural population of the same age, the former being only seven hundred and

teen per cent. higher, than that of the male agricultural population. It also shows that, at the age of forty-five to fifty-five, the London tailors have nearly twice, and the London printers more than twice, the mortality of the agriculturists.

In support of the same opinion with regard to other industries, I would refer to the detailed evidence given in my third, fourth, and fifth reports, and to the overwhelming statistical evidence which has recently been laid before Parliament. Especially I would advert again to the statistics which I have already quoted, with regard to the presence of pulmonary disease at our principal seats of textile industry, and in our strawplaiting, glove-making, hosiery, and lace-making districts. And in further illustration of the case, I would submit the annexed table, showing to how deplorable an extent various other industries tend to destroy their work-people by chronic lung-disease (here usually not phthisical, but irritative and inflammatory) which breaks them down in what should be their prime of life. By this table, namely, the fact is shown that, in the districts where miners and metal-forgers and cutlers and potters follow their respective industries, the death-rate, by Lung-Disease, of men aged from forty-five to sixty-five, is from two and a half to eight times as high as in healthy agricultural districts.

These arguments, taken altogether, will, I trust, establish my position. Doubtless, there may be some small technical difficulty in defining the exact line at which employers shall become subject to regulation. But I would submit that, in principle, the sanitary claim is universal. And in the interest of myriads of labouring men and women, whose lives are now needlessly afflicted and shortened by the infinite physical suffering which their mere employment engenders, I would

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fifteen, while the latter is seven hundred and sixty-two. But the fallacy of this representation is seen as soon as we look at the death-rate of tailors at the same age in England and Wales generally, which is one thousand one hundred and thirteen. Similarly, the death-rate of printers generally at the age of twenty to twenty-five is nine hundred and forty-nine, while the fallacious death-rate of the London printers at that age is only six hundred and ninety-eight.

venture to express my hope that universally the sanitary circumstances of labour may, at least so far, be brought within appropriate provisions of law, that the effective ventilation of all in-door workplaces may be ensured, and that in every naturally insalubrious occupation the specific health-endangering influence may as far as practicable be reduced.

Deaths per 100,000 by Phthisis and other Diseases of the Lung.			Mean of the Two Columns, reduced for Facility of Comparison, to the Scale of the Standard group, taken as 100.
	Men aged 45--55.	Men aged 55--65.	
Redruth . . . . .	1,499	2,360	482 $\frac{1}{2}$
Penzance . . . . .	975	1,157	266 $\frac{1}{2}$
Wolstanton . . . . .	1,173	1,811	373
Stoke-on-Trent . . . . .	1,309	1,787	387
Wolverhampton . . . . .	763	1,430	274
Birmingham . . . . .	1,169	1,907	384 $\frac{1}{2}$
Aston . . . . .	697	1,290	248 $\frac{1}{2}$
Sheffield . . . . .	1,205	1,912	389 $\frac{1}{2}$
Reeth . . . . .	1,391	3,214	575 $\frac{1}{2}$
Alston . . . . .	2,069	4,400	808 $\frac{1}{2}$
Abergavenny . . . . .	628	1,305	241 $\frac{1}{2}$
Merthyr Tydfil . . . . .	898	1,582	310
Standard Northern Districts .	322	477	100

## E (a).

Papers relating to the Sanitary State of the People of England (General Board of Health, 1858), by E. Headlam Greenhow, M.D., p. 38. Table xiv.

Average annual Pulmonary Death-rates for the eight healthy districts—Bootle, Bülth Easington, Garstang, Glendale, Haltwhistle, Houghton-le-Spring, and Romney Marsh; and for the eight urban districts, Liverpool, West Derby, Manchester, Salford, Charlton, Birmingham, Blackburn, and Leeds.

—	Per 100,000 persons of both Sexes.	Per 100,000 Males.	Per 100,000 Females.
Eight healthy Districts .	322	305	340
England and Wales . .	552	569	535
Eight unhealthy Districts	811	862	764

The Pulmonary mortality of males is rather higher than that of females in England and Wales. The female Pulmonary mortality is one-eighth more than that of males in the eight healthy districts; the male mortality being at the rate of 305, and the female at the rate of 340 per 100,000 persons of each sex respectively. It is just the converse in the eight unhealthy towns, for in them the male Pulmonary death-rates exceeds the female by about an eighth. The exact numbers are 862 in each 100,000 males and 764 in each 100,000 females. Thus the insalubrious influence in these towns act most powerfully on the male population, a circumstance which appears to show that the cause of the unhealthiness of these places does not exclusively consist in the unwholesomeness of dwellings.

## F.

On the occasional and decided predominance of female over male mortality from Phthisis. Sixth Report of the Medical Officer of the Privy Council, 1864. pp. 23, 24.

When many persons are employed together in any in-door industry, the ventilation of the workplace is likely to be so bad as to convert the employment, which perhaps in its own nature is not of hurtful tendency, into an employment seriously dangerous to health. Here (as I anticipated in my report of 1858) lies the explanation of a fact most deplorable for the working classes of our country,—that, *in proportion as the people of a district are attracted to any collective in-door occupation, in such proportion, other things being equal, the district death-rate by lung-diseases will be increased.* For the bad ventilation which, as a rule, belongs to the place of employment, tends to develope among the workpeople a large excess of Phthisis, and probably also some excess of other fatal Lung-disease. And probably in all England there is no exception to the rule, that, in every district which has a large in-door industry, the increased mortality of the workpeople is such as to colour the death-return of the whole district with a marked excess of Lung-Disease. The mortuary statistics, recently laid before Parliament, place this matter in a singularly striking light. In those returns, for instance, it may be seen, that while about one hundred deaths by Phthisis and other Lung-Diseases are occurring in various agricultural districts of England among men aged from 15 to 55, there occur, on similar masses of population, in Coventry one hundred and sixty-three such deaths, in Blackburn and Skipton one hundred and sixty-seven, in Congleton and Bradford one hundred and sixty-eight, in Leicester one hundred and seventy-one, in Leek one hundred and eighty-two, in Macclesfield one hundred and eighty-four, in Bolton one hundred and ninety, in Nottingham one hundred and ninety-two, in Rochdale one hundred and ninety-three, in Derby one hundred and ninety-eight, in Salford and Ashton-under-Lyme two hundred and three, in

Leeds two hundred and eighteen, in Preston two hundred and twenty, and in Manchester two hundred and sixty-three. The same sort of evidence comes out even more strongly, when (as in the annexed table) the statistics are limited to the decenniad of adolescence, and are so given, that, with regard to districts where only one sex pursues indoor industry, the death-rates of the sexes may be compared. There, for instance, it is seen,—and not any one who knows the circumstances under which girls are employed in lace-making and straw-plaiting can wonder at the fact,—that among the adolescent population of Berkhamstead, Newport Pagnell, Towcester, and Leighton Buzzard, the female victims of Lung-disease are more than twice as numerous as the male. And there again, in the death-rates of Leek, Congleton, and Macclesfield, the same sort of sad testimony is borne (but not exclusively by the female population) as to the atrocious sanitary circumstances under which much of our silk-industry is conducted.

District.	Nature of principal Industry pursued in the District.	Death-rates, by Phthisis, and other lung diseases, at between 15 and 25 years of age, per 100,000 of each class referred to.	
		Male.	Female.
Berkhamstead - - - }	Extensive female employment in straw plaiting - - - - -	219	578
Leighton Buzzard - - - }		309	554
Newport Pagnell - - - }	Extensive female employment in lace-making - - - - -	301	617
Towcester - - - }		239	577
Yeovil - - - }	Extensive female, with some male, employment in glove making - - - - -	280	409
Leek - - - }		437	856
Congleton - - - }	Extensive employment, more female than male, in silk work - - - - -	566	790
Macclesfield - - - }		593	890
Standard Northern Districts -	Agriculture - - - - -	331	333

“The average of the whole is an excess of mortality of 41 per cent. of the female sex.”

(See Preface.)

The first of these is the fact that the population of the United States in 1870 was 38,556,000, and in 1880 it was 50,155,000. This increase of 11,599,000 represents an increase of 30 per cent. in the population of the country in ten years. The second fact is that the population of the United States in 1870 was 38,556,000, and in 1880 it was 50,155,000. This increase of 11,599,000 represents an increase of 30 per cent. in the population of the country in ten years. The third fact is that the population of the United States in 1870 was 38,556,000, and in 1880 it was 50,155,000. This increase of 11,599,000 represents an increase of 30 per cent. in the population of the country in ten years.

Year	Population	Increase
1870	38,556,000	-
1880	50,155,000	11,599,000
1890	62,949,000	12,794,000
1900	76,212,000	13,263,000
1910	92,228,000	16,016,000
1920	106,000,000	13,772,000
1930	123,202,000	17,202,000
1940	137,323,000	14,121,000
1950	151,957,000	14,634,000
1960	179,323,000	27,366,000

The increase of the population of the United States in the last century is shown in the following table:

The population of the United States in 1870 was 38,556,000.