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On the Results of the Operations of the Gotha Life Assurance Bank for the first Twenty-five Years of its existence, particularly with respect to the Mortality amongst the Lives Assured. By Herr RATH G. HOPF, Manager of the above, and Corresponding Member of the Institute of Actuaries in London, and of the Academy for Useful Sciences at Erfurt.

(Concluded from p. 337, Vol. V.)

IN order to be able more accurately and under different points of view to observe the law of mortality which prevails amongst the assured, I have, besides the usual observations from one calendar year to another, on which the above calculations are founded, arranged other observations, in which the assured are classified from one *year of assurance* to another. The date of the *first* policy issued on the life of a person is the period at which, in this register, he yearly advances from one year of age to another. The payment of the premium and continuation of the assurance in the Gotha Office is regularly made for one year: however, it is permitted (but only to persons assured for the whole term of life) to pay their premiums also at half yearly rates; but the second half yearly payment is only considered as delayed, and those who desire to withdraw have no claim to any return for the premiums they have paid until they have also made the second half yearly payment. The consequence of this is, that, with very few exceptions, persons withdraw only at the end of a year of assurance. All the assured persons enter at the *beginning* of a year, die in the *course* of one, or

withdraw at the *end* of one. They are therefore, with the exception of the year of their death, always *full* years in the circle of observation. This arrangement requires no correction for admission and withdrawal, as was necessary in the former case, and affords therefore a greater accuracy. Besides, tables arranged in this way offer the means of being able to consider separately all persons assured at a certain age, and to compute the mortality for these persons by themselves, and likewise to determine the mortality for each period of the assurance from its commencement.

Finally, I have separated both sexes in these tables, that the rate of mortality may be found for either. These tables were brought down to the years of assurance finishing in 1852, and have given the following results for the mortality of both sexes. It is to be remarked, that the youngest and highest classes of age have been omitted, as containing too small a number of facts.

TABLE VII.—*Mortality of the Males and Females in the Gotha Life Assurance Bank, during the Years 1829–1852:—*

Ages.	Males.			Females.			Difference of the Mortality per cent.			
	Assured.	Died.	Mortality per cent.	Assured.	Died.	Mortality per cent.	Plus.		Minus.	
							Abso- lute.	Per cent.	Abso- lute.	Per cent.
26—30	9,139	70	0·77	721	12	1·66	0·89	115·58	..	..
31—35	23,497	208	0·88	1,285	23	1·79	0·91	103·41	..	..
36—40	35,782	342	0·98	1,823	35	1·92	0·94	95·92	..	..
41—45	40,043	424	1·06	2,054	19	0·92	..	..	0·14	13·21
46—50	35,615	515	1·45	2,170	33	1·52	0·07	4·83	..	..
51—55	27,284	515	1·89	2,279	34	1·49	..	..	0·40	21·16
56—60	18,840	525	2·79	2,086	74	3·55	0·76	27·24	..	..
61—65	10,857	459	4·23	1,508	43	2·19	..	..	2·04	48·23
66—70	4,802	302	6·29	797	37	4·64	..	..	1·65	26·23
71—75	1,690	161	9·53	256	23	8·98	..	..	0·55	5·77
76—80	373	45	12·06	48	6	12·50	0·44	3·65	..	..
								350·63		114·60

On examining this table, and the difference between the mortality of men and women indicated in its last column, the great mortality of women at the younger ages instantly catches our eyes. In general, it has been hitherto supposed and proved, by experience in mixed populations, that women have a longer duration of life than men—that therefore a less mortality is peculiar to them, and that *married* women are especially favoured in this respect. The prevailing majority of the females assured by the Gotha Office, perhaps five sixths, are married or widows, and only one sixth not

married. Nevertheless, their mortality, in the years of the capability of conception under 40, exceeds double that of men. In the later period (*cessatio mensium*) of 40–50, the mortality of females is nearly equal to that of males; and it does not become lower until after this age, and not then in such a degree as to balance the above difference: the sum of the differences per cent. on the positive side is, in fact, three times greater than the sum of the differences per cent. on the negative side. Besides, it must be noticed that the Gotha Office does not assure women in the state of pregnancy, but delays the assurance for a favourable termination, and provided the next six weeks are passed without interruption of health; and, that in general the greatest strictness and precaution are exercised in the admission of such assurances, as a greater mortality among assured females was for a long time found to prevail.

However, those ages at which females show so high a rate of mortality in the Gotha Office, being the same in which the greatest number of admissions occur, gives rise to the question whether the Office is not often grossly deceived by females—that the reason why it experiences a higher mortality in these years is because many of the females assured had the germ of an early death in them at the time of effecting the assurance. If this were the case, a higher mortality would naturally occur soon after the completion of the assurance. The following table shows how far this is the case:—

TABLE VIII.—*Mortality in the first Quinquennium from the date of the Policy, and after the first Quinquennium.*

MALES.										
Ages.	In the first Quinquennium.			After the first Quinquennium.			Difference.			
	Assured.	Died.	Mortality per cent.	Assured.	Died.	Mortality per cent.	Plus.		Minus.	
							Absolute.	Per cent.	Absolute.	Per cent.
26—30	8,334	65	0·78	805	5	0·62	..	..	0·16	20·51
31—35	18,029	157	0·87	5,468	51	0·93	0·06	6·90	..	..
36—40	20,853	188	0·90	14,929	154	1·03	0·13	14·44	..	..
41—45	17,209	158	0·92	22,834	266	1·16	0·24	26·09	..	..
46—50	11,798	159	1·35	23,817	356	1·49	0·14	10·37	..	..
51—55	7,913	151	1·91	19,371	364	1·88	..	..	0·03	1·57
56—60	4,752	123	2·59	14,088	402	2·85	0·26	10·04	..	..
61—65	1,761	63	3·58	9,096	396	4·35	0·77	21·51	..	..
66—70	175	7	4·00	4,627	295	6·38	2·33	59·50	..	..
71—75	1	..	..	1,689	161	9·53	..	..	..	..
76—80	..	..	..	373	45	12·06	..	..	..	..

TABLE VIII. (*Continued.*)

FEMALES.										
Ages.	In the first Quinquennium.			After the first Quinquennium.			Difference.			
	Assured.	Died.	Mortality per cent.	Assured.	Died.	Mortality per cent.	Plus.		Minus.	
							Absolute.	Per cent.	Absolute.	Per cent.
26—30	546	9	1·65	175	3	1·71	0·06	3·64	..	..
31—35	836	18	2·15	449	5	1·11	..	..	1·04	48·37
36—40	1,012	17	1·68	811	18	2·22	0·54	32·14	..	..
41—45	955	11	1·15	1,699	8	0·73	..	..	0·42	36·52
46—50	1,004	21	2·09	1,166	12	1·03	..	..	1·06	50·72
51—55	1,122	22	1·96	1,157	12	1·04	..	..	0·92	46·94
56—60	874	31	3·55	1,212	43	3·55	..	..	..	..
61—65	365	7	1·92	1,143	36	3·15	1·23	64·06	..	..
66—70	64	3	4·69	733	34	4·64	..	..	0·05	1·07
71—75	2	..	..	254	23	9·05	..	..	..	..
76—80	..	..	..	48	6	12·50	..	..	..	..

According to this table, the mortality of males is considerably less in the first five years from the commencement of the assurance than in the following period; in these, therefore, the selection of lives is very remarkably to the advantage of the Society. But great irregularities appear in the single groups of age of females, the proportion of whom assured is much smaller than of males; yet, on an average, their mortality was somewhat higher in the first five years than afterwards. Nevertheless, particular strictness, as has been mentioned already, is exercised in assuring females. The Gotha Office did not succeed in proving a fraud practised by a woman on it by an irregular declaration, or by producing false certificates, and in annulling the assurance in consequence of it: and yet the number before us clearly prove that females understand better than males to gain advantage in the assurance. How may this be explained? I think we must seek the principal cause of it in the circumstance that women, from the greater bashfulness peculiar to their sex, frequently do not communicate all their bodily infirmities and irregularities to their physicians, much less to others, and feel themselves therefore much less under obligation to give notice to the Assurance Office of what they consider their own secret respecting the condition of their body. They think even a question about it an indiscretion and a violation of their delicacy, which might entitle them by itself to avoid the truth in the answer. But the finer constitution of their nerves undoubtedly enables them to feel earlier, and before they are perceptible out-

wardly, those ailments and changes which may be going on in their system; and, however indistinct such a feeling may be in them, yet they are more impelled by it than men to take precautions against the threatening evil. Allusion is often made to a faculty of presaging peculiar to single persons, and attributed in a higher degree to women than to men. If such a faculty of presaging really exists, it may result from that natural cause, but it forms at the same time a sort of influence against which Life Assurance Companies must be on their guard. At all events, these Offices cannot be sufficiently cautious in assuring women under 40 years of age, after the observations mentioned above, and they are perfectly entitled to demand a higher premium from women than from men for assurances at this age.

The English Life Assurance Offices also have experienced that mortality is greater amongst females than amongst males assured,* but only at the ages between 20 and 50 years; at the ages from 50 to 70 years of age they have observed a less mortality amongst females than amongst males. Since this observation was made, they have ceased to charge lower premiums for the assurances of females than of males, which several Offices formerly did, in consequence of the observation made in a mixed population, that in general the mean duration of life of females was greater than that of males. Table IX. offers further comparisons.

Married men only are received as members into the Prussian Widows' Fund, and their state of health only is submitted to an examination on admission. The health of their wives is not taken into consideration. The experience of this Society, moreover, as regards the female sex, extends only to married women and widows, not to unmarried girls. Nevertheless, at the ages under 40 years the mortality is less by one third in this Society than at the Gotha Office; beyond that limit it is greater for some ages, and is then, upon an average, higher than at the Gotha Office. The female sex, in the mixed population of England, France, Belgium, and Saxony, shows also a mortality lower by 15 to 40 per cent., at the ages under 40 years, than the females assured by the Gotha Office, but a higher mortality, upon an average, beyond that limit.

There is therefore no doubt that a greater proportion of females who assure their lives at the younger years dies early. The deviation is too significant and too constant to be considered accidental. We are not able to explain it by any other supposition than by the circumstance that women feel internal hidden infirmities and defects

* Jenkin Jones: *A New Rate of Mortality*. London, 1843. Page 17.

TABLE IX.—*Mortality of Females in the Gotha Life Assurance Office, compared with the Mortality of Females in the Prussian Widows' Fund and in some mixed Populations.*

AGES.	PRUSSIAN WIDOWS' FUND (Wives and Widows).					ENGLAND—Females.					FRANCE—Females.					BELGIUM—Females.					SAXONY—Females.				
	Difference.					Difference.					Difference.					Difference.					Difference.				
	Mortality per cent.	Plus.		Minus.		Mortality per cent.	Plus.		Minus.		Mortality per cent.	Plus.		Minus.		Mortality per cent.	Plus.		Minus.		Mortality per cent.	Plus.		Minus.	
		Abso- lute.	Per cent.	Abso- lute.	Per cent.		Abso- lute.	Per cent.	Abso- lute.	Per cent.		Abso- lute.	Per cent.	Abso- lute.	Per cent.		Abso- lute.	Per cent.	Abso- lute.	Per cent.		Abso- lute.	Per cent.	Abso- lute.	Per cent.
26-30	1.66	..	..	0.50	30.12	0.98	..	..	0.68	40.96	0.92	..	..	0.74	44.58	1.41	..	..	0.25	15.06	1.11	..	..	0.55	33.13
31-35	1.79	..	..	0.60	33.52	1.08	..	..	0.71	39.66	1.03	..	..	0.76	42.46	1.47	..	..	0.32	17.88	1.20	..	..	0.59	32.96
36-40	1.92	..	..	0.71	36.98	1.20	..	..	0.72	37.50	1.12	..	..	0.80	41.67	1.63	..	..	0.29	15.10	1.34	..	..	0.58	30.21
41-45	0.92	0.27	29.35	..	..	1.33	0.41	44.57	..	..	1.26	0.34	36.96	..	..	1.89	0.97	105.43	..	..	1.54	0.62	67.39	..	..
46-50	1.52	1.35	..	0.17	11.18	1.47	..	..	0.05	3.29	1.46	..	..	0.06	3.95	1.78	0.26	17.11	..	..	1.88	0.86	23.68	..	..
51-55	1.49	1.76	0.27	18.12	..	1.66	0.17	11.41	..	..	1.97	0.48	32.21	..	..	2.15	0.66	44.30	..	..	2.54	1.05	70.47	..	..
56-60	3.55	2.59	..	0.96	27.04	2.37	..	..	1.18	33.24	2.70	..	..	0.85	23.94	2.58	..	..	0.97	27.32	2.54	..	..	0.21	5.92
61-65	2.19	3.69	1.50	68.49	..	3.50	1.31	59.82	..	..	4.21	2.02	92.24	..	..	3.48	1.29	58.90	..	..	5.26	3.07	140.18	..	..
66-70	4.64	5.93	1.29	27.80	..	5.16	0.52	11.21	..	..	5.81	1.17	25.22	..	..	4.95	0.31	6.68	..	..	6.88	2.24	48.28	..	..
71-75	8.98	8.96	..	0.02	0.22	7.58	..	..	1.40	15.59	9.33	0.35	3.90	..	..	7.75	..	..	1.23	13.70	10.29	1.31	14.59	..	..
76-80	12.50	12.21	..	0.29	2.32	11.06	..	..	1.44	11.52	12.72	0.22	1.76	..	..	11.56	..	..	1.14	9.12	14.61	2.11	16.83	..	..

in a higher degree than men, and have a presentiment of approaching danger in consequence of them which impels them to assure their lives; or that they understand better and more skilfully than men to hide the true state of their health, and to deceive by it even their medical men. This is facilitated by the proceeding of many physicians, who think themselves obliged to act with greater delicacy and respect in the medical examination of females. That influence, however, is felt only for a certain series of years; at a higher age the assured females are subjected to the common law of mortality, which is more favourable at this period to them than to males.

If we compare, in order to convince ourselves of the latter fact, the mortality of the female sex according to Table IX. with that of the male sex according to Tables V. and VI., it results—

1, That in Germany (Gotha Office, Prussian Widows' Fund, and Kingdom of Saxony) females at the ages below 40 years have a greater, and at the ages above 40 years a less, mortality than males;

2, That in England the mortality of the female sex is equal to that of the male sex at the ages under 40 years, but is diminished in proportion beyond that limit;

3, That in France women have a higher, and,

4, In Belgium a lower, mortality than men at all ages.

It appears from this that France only (according to the table of Demonferrand) forms an exception to the law that the female sex exhibits a less mortality at the higher ages than the male.

These results will be observed in the above tables of mortality, (constructed with care) which I have made use of, if we consider only the ages above 20 years; the same law appears also in the group of age of 20–25 years, which has not been mentioned above.

We annex, in the last place, some tables showing the diseases and other causes of death amongst the assured in the Gotha Life Bank up to the end of 1853.

TABLE X.—Deaths among the Assured Persons of the Gotha Life Assurance Office during the Years 1829–1854, arranged according to the causes of Death and the Ages of the Assured Persons.

Diseases and other causes of Death.	Ages at Death.						
	15–30	31–40	41–50	51–60	61–70	71–87	All ages.
Fever	22	133	197	206	123	36	717
Influenza.....	..	12	12	12	20	7	63
Asiatic cholera.....	..	18	28	36	30	8	120
Exanthematic diseases.....	2	5	2	1	1	..	11
Local inflammation	13	95	147	157	113	29	554
Gout and rheumatism.....	4	20	32	32	34	5	127
Chronic diseases of the } respiratory organs.....	23	163	239	181	84	8	698
Chronic abdominal diseases.	1	57	120	161	152	27	518
Organic diseases of the brain	..	15	27	33	21	5	101
Organic diseases of the } spinal marrow.....	..	7	12	9	15	2	45
Organic diseases of the heart	2	8	27	39	38	5	119
Dropsy.....	3	24	82	140	122	35	406
Cancers and malignant ulcers	..	3	30	27	21	11	92
Apoplexy.....	7	34	107	233	184	58	623
Old age.....	..	..	..	..	54	115	169
Accidents.....	..	9	18	16	11	..	54
Murdered.....	..	1	1	1	..	..	3
Suicide.....	4	18	29	34	14	1	100
Capital punishment.....	..	..	1	..	..	..	1
Total.....	81	622	1,111	1,318	1,037	352	4,521

This table shows at which age and by what diseases the assured persons have died. The proportion of these figures to each other catches the eye more clearly if we reduce all deaths occurring in one class of age to 100. The result is the following table, which indicates the proportion per cent. of the persons who have died in any one class of age by each disease, showing therefore the *intensity* of the diseases causing death at the different periods of life.

The total number of deaths in the different *classes of age* in Table X. does not exactly agree with the corresponding number of deaths in the same classes of Table III. This difference arises from the circumstance that persons who died, as well as the assured, have been entered into Table III. for every calendar year according to the age they had at the *date of their policy* in the corresponding calendar year; into Table X., on the contrary, exactly according to the age at the *day of death* of the persons who died. The difference, however, is inconsiderable, and not of consequence to our computation. In both cases, six months above the year of age last completed are omitted, and more than six months are taken to represent a whole year.

TABLE XI.—*Intensity of the Diseases for the different classes of Age, in per centage of the Number of Deaths in each class of Age.*

Diseases and other causes of Death.	Ages at Death.						
	15-30	31-40	41-50	51-60	61-70	71-87	All Ages.
Fever	27·16	21·38	17·74	15·63	11·86	10·23	15·87
Influenza .....	..	1·93	1·08	0·91	1·93	1·99	1·39
Asiatic cholera .....	..	2·89	2·52	2·73	2·89	2·27	2·65
Exanthematic diseases	2·47	0·80	0·18	0·08	0·10	..	0·24
Local inflammation	16·05	15·27	13·23	11·91	10·90	8·24	12·25
Gout and rheumatism	4·94	3·22	2·88	2·43	3·28	1·42	2·81
Chronic diseases of the re- spiratory organs	28·40	26·21	21·51	13·73	8·10	2·27	15·45
Chronic abdominal diseases	1·23	9·16	10·80	12·22	14·65	7·67	11·46
Organic diseases of the brain	..	2·41	2·43	2·50	2·03	1·42	2·23
Organic diseases of the spinal marrow .....	..	1·13	1·08	0·68	1·45	0·57	1·00
Organic diseases of the heart	2·47	1·29	2·43	2·96	3·66	1·42	2·63
Dropsy	3·70	3·86	7·38	10·62	11·76	9·94	8·98
Cancers and malignant ulcers	..	0·48	2·70	2·05	2·03	3·12	2·03
Apoplexy	8·64	5·47	9·63	17·68	17·74	16·48	13·78
Old age .....	..	..	..	..	5·21	32·68	3·74
Accidents .....	..	1·45	1·62	1·21	1·06	..	1·19
Murdered .....	..	0·16	0·09	0·08	..	..	0·07
Suicide	4·94	2·89	2·61	2·58	1·35	0·28	2·21
Capital punishment .....	..	..	0·09	..	..	..	0·02
	100·00	100·00	100·00	100·00	100·00	100·00	100·00

From this abstract it appears that the following six diseases claim most of the victims :—

	Per cent.
Common fevers	15·87
Chronic diseases of the respiratory organs . . .	15·45
Apoplexy	13·78
Local inflammations	12·25
Chronic abdominal diseases	11·46
Dropsy	8·98
Total	77·79

More than three fourths, therefore, of all deaths, are caused by these six forms of disease—not equally, however, at all ages. In those under 50 years, chronic diseases of the respiratory organs, common fevers—and next to these, though in a lower degree, inflammations—prevail; beyond the 50th year these diseases are less apparent, and apoplexies, dropsies, and chronic abdominal diseases get the superiority by degrees. The vertical rows of Table XI. accurately indicate for each class of age the share each disease has in the deaths which took place in a class; the horizontal rows indicate how the share of each disease in the deaths rises or falls with the ages, or continues the same—how, therefore, the intensity of the disease changes with the age. It results from it—

1, That the intensity of the common fevers, the inflammations, and the chronic diseases of the respiratory organs, diminishes with the advancing age, and that this diminution takes place most in the chronic diseases of the respiratory organs; that, on the contrary,

2, The intensity of the chronic abdominal diseases, dropsies, and apoplexies, rises with the advancing age, the highest class excepted; that therefore these diseases demand more and more victims: that, finally,

3, The intensity of the influenza, Asiatic cholera, organic diseases of the brain and spinal marrow, is nearly the same for the ages over 30 years; and that, in the Office, there have been no victims at all to these diseases at the ages under 30 years.

But the intensity or frequency of a certain disease at the different ages is not the same with the danger of being seized and carried off by it. This danger, or the *lethality* of the disease, results from comparing the deaths caused by it with the number of the persons who had been assured in each class of age. The result of this comparison is contained in the following table, which indicates, out of a thousand persons living at a time, how many died in the course of a year by the different diseases in each class of age.

TABLE XII.—*Lethality of the Diseases for the different classes of Age, in the proportion per 1,000 of the number of Lives at Risk in each class of Age.*

	Ages.						For all Ages.
	15-30	31-40	41-50	51-60	61-70	71-87	
Number of lives at risk } for a whole year. }	11,193	65,378	89,705	59,592	22,562	3,459	251,889
Fever	1.97	2.03	2.20	3.46	5.45	10.41	2.85
Influenza .....	..	0.18	0.14	0.20	0.89	2.02	0.25
Asiatic cholera .....	..	0.27	0.31	0.60	1.33	2.31	0.48
Exanthematic diseases	0.18	0.08	0.02	0.02	0.04	..	0.04
Local inflammation	1.16	1.45	1.64	2.63	5.01	8.38	2.20
Gout and rheumatism.	0.36	0.31	0.36	0.54	1.51	1.45	0.50
Chronic diseases of the re- } spiratory organs	2.05	2.49	2.66	3.04	3.72	2.31	2.77
Chronic abdominal diseases.	0.09	0.87	1.34	2.70	6.74	7.81	2.06
Organic diseases of the brain	..	0.23	0.30	0.55	0.93	1.45	0.40
Organic diseases of the } spinal marrow .....	..	0.11	0.14	0.15	0.66	0.58	0.18
Organic diseases of the heart	0.18	0.12	0.30	0.65	1.69	1.45	0.47
Dropsy	0.27	0.37	0.91	2.35	5.41	10.12	1.61
Cancers and malignant ulcers	..	0.05	0.33	0.45	0.93	3.18	0.37
Apoplexy	0.63	0.52	1.19	3.91	8.16	16.77	2.47
Old age .....	..	..	..	..	2.39	33.25	0.67
Accidents .....	..	0.14	0.20	0.27	0.49	..	0.21
Murdered .....	..	0.02	0.01	0.02	..	..	0.01
Suicide	0.36	0.28	0.32	0.57	0.62	0.29	0.40
Capital punishment .....	..	..	0.01	..	..	..	0.00
Total for all diseases	7.25	9.52	12.36	22.11	45.97	101.78	17.94

According to this table, for example, the danger or the probability of dying of dropsy at the age of 51-60 years is, for every year, on an average, = 2.35 per mille, and the danger of being carried off by an abdominal disease at the age of 61-70 years, for every year, = 6.74 per mille. It results further, from this table, that the danger of being carried off increases with the advancing age for almost all diseases—in rapid proportion in some (for instance, apoplexies), in a less rapid proportion in others, especially the chronic diseases of the respiratory organs; and that only the exanthematic diseases and some organic complaints form an exception at the highest ages. As man in general, after the prime of infancy, is subjected to the danger of death in a degree always higher with the advancing age, the danger of being seized by this or that disease increases with the age; and even those diseases make no exception, the intensity of which diminishes with the advancing age, according to Table XI.—as, for instance, common fevers and inflammations. This increase of lethality takes place as to Asiatic cholera

in nearly equal proportion with the rise of general mortality; it proceeds more slowly in other diseases, especially fevers, inflammations, and chronic diseases of the respiratory organs; its increase is more rapid than the rise of general mortality in other diseases, namely, the chronic abdominal diseases, dropsies, and apoplexies—as results from a comparison of the figures in Table XII., for the single diseases, with those in the last column, for all diseases, or for the general mortality.

The cases of suicide, of which not less than 100 (that is, $2\frac{1}{5}$ per cent. of all deaths) occurred among the persons assured in the first 25 years, deserve a particular attention. This proportion appears uncommonly high in comparison with the observations in common life, as not quite half per cent. of all who die put an end to life voluntarily, according to the observations in the populations of the civilized states of Europe. But it is to be considered that the Assurance Company of Gotha is not equally composed of both sexes, but consists of by far the greater part of males—that, beside, the persons assured by it are not divided among all ages in the same proportion as in a mixed population, but are found more especially at the middle ages between 30 and 60 years. It is, however, known that suicides are much more frequent among men than among women, and that those of old men and children are the rare exceptions. For this reason, then, the proportion must be higher in a Company of which, like that of the Gotha Bank, the fifteenth part only consists of women, and does not include any children at all, and only a few old men. It is to be considered besides, that many a case of suicide is, for humanity's sake, and because careful examinations either cannot be made or are not thought necessary, entered in the public bills of mortality as natural death, or as caused by some accident, which would have been proved at the Office as suicide on account of the accurate inquiry about the cause of death, and the testimonies and proofs of it which are to be brought forward.

Although the latter reason does not allow an accurate comparison of the Gotha experience with the results of mixed populations, we cannot help inserting a table borrowed from a most interesting paper of Mr. Jopling,* in order to show how, in a mixed population, the cases which are registered in the public bills as suicides are distributed to the different ages and to both sexes.

* *Assurance Magazine*, tom. i. p. 316 ; tom. ii. p. 32.

TABLE XIII.—*Suicides in London during the Years 1846–1850.*

MALES.					
Ages.	Population of 1848 (5 times).	Number of Deaths in 5 Years.	Number of Suicides in 5 Years.	Proportion in per Cent. for One Year.	
				To Population.	To Deaths.
15—24	997,695	8,665	96	0·00962	1·11
25—34	945,505	10,630	138	0·01460	1·30
35—44	685,350	11,860	186	0·02714	1·57
45—54	445,665	11,685	192	0·04308	1·64
55—64	247,275	11,600	122	0·04934	1·05
65—74	119,585	10,235	60	0·05017	0·59
75—84	34,075	5,660	16	0·04696	0·28
FEMALES.					
15—24	1,249,665	8,325	89	0·00712	1·07
25—34	1,146,915	11,020	91	0·00793	0·83
35—44	781,460	10,675	79	0·01011	0·74
45—54	505,850	10,250	62	0·01226	0·60
55—64	294,220	10,940	43	0·01461	0·39
65—74	159,915	11,885	16	0·01001	0·14
75—84	54,905	8,480	6	0·01093	0·07

In comparing this table with the corresponding columns in the Tables XI. and XII., we are struck by the very considerable rate of suicides among the assured in the Gotha Company at the ages of 15–30 years. This rate is more than four times as great as the corresponding rate among the London male population. Such a difference cannot be caused by the reason above-mentioned alone. A further difference is found in the proportion of the cases of suicide to the cases of death in general. This proportion is, in the Gotha Company, *decreasing* from the younger ages to the higher ones (Table XI.); in the London male population it *increases* till the age of 55 years, and does not *decrease* until beyond this period of age. The proportion of suicides to the living persons is naturally also higher in the Gotha Company (Table XII.) than in the London male population; but, abstracted from the abnormality in the youngest class, it increases in both cases from the younger ages to the higher ones till the age of 70 years, beyond which it decreases in both cases.

Respecting the manner of committing suicide and the age at death, the cases of suicide in the Gotha Company are arranged in the following classes :—

TABLE XIV.—*Suicides, arranged according to the Age of the Self-murderers and the mode of Suicide.*

Mode of Suicide.	Ages at Death.										
	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	Total.
Shooting	4	2	3	8	5	7	3	2	1	..	35
Hanging . . . .	..	4	3	2	6	2	2	6	1	..	26
Drowning ..	..	..	2	1	4	7	4	3	..	..	21
Cutting throat	..	..	2	..	1	3	1	1	..	1	9
Stabbing ..	..	1	1	2	..	.	.	..	..	..	4
Opening veins	..	..	..	..	..	..	2	..	..	..	2
Poisoning ..	..	.	..	..	.	2	..	..	..	..	2
Throwing out of window/	..	..	..	..	..	..	1	..	..	..	1
	4	7	11	13	16	21	13	12	2	1	100

The number of all suicides amounting to 100, the figures in the preceding and following table indicate at the same time the rate per cent. to the number of all suicides.

In common life most suicides are committed by hanging and drowning, because these are the two kinds of death which are especially chosen by females and younger persons who voluntarily put an end to life. Amongst the members of the Gotha Bank, which is chiefly composed of men in middle age, the greatest part of self-murderers (namely, 35 per cent.) have destroyed life by shooting.

Respecting the number of suicides in comparison to the population in Germany, the most suicides occur in the ages between 40 and 60 years. In the Gotha Bank, the proportions to the persons assured was the greatest between 50 and 70 years, as will be seen from Table XII.

The examination made by the Gotha Office on the suicides extends also to their motives. The following classification results from them (*see* Table XV., p. 14) :—

According to this table, most suicides (namely, 36 per cent.) are produced by melancholy and absence of mind. However, this disease was in most cases such, that the free use of the intellectual powers was not quite lost, and the person disordered in mind usually had still his lucid intervals. None of those committed suicide who, being quite deprived of the free use of their senses, had fallen into madness and rage; in general, none of such in whom frenzy had risen to such a degree that they must be brought into a madhouse. In all who put an end to their life through melancholy, the power of thought was more or less prejudiced, but never

abolished, by this state of their mind. Many of them had fulfilled their duties of life with regularity up till the time of their death. But a certain grief, depending on a conceived opinion or a fixed idea or an inexplicable anxiety, had seized them in such a manner that, though very well knowing what they did, they found their condition on earth insupportable, and could not resist the propensity to death. In such a state, they had recourse by preference to the cord, musket, and razor; the blue mirror of the water, for which the mind alarmed by fear chiefly searches, attracted these unfortunate persons more seldom. A great number of civil officers, and among them also of officers of public revenue, being among the assured, deficiencies in the cash accounts managed by them were not unfrequently the motives to suicide. There happened not less than 18 cases of this kind. The majority of these officers, driven to despair by anxiety, have ended their life by drowning.

TABLE XV.—*Suicides arranged according to the Motives for Suicide and the Mode of it.*

Motives for Suicide.	Shooting.	Hanging.	Drowning.	Cutting Throat.	Stabbing.	Opening Veins.	Poisoning.	Throwing out of Window.	Total.
Despair in consequence of bodily sufferings and ruined health	1	..	..	..	1	..	..	..	2
Fear of inquiry and punishment in consequence of committed crimes ..	1	4	1	..	..	2	..	..	8
In consequence of deficiency in cash by officers of public revenue	5	3	9	1	..	..	..	..	18
Ruined fortune	3	5	5	..	..	..	1	..	14
Failure of business	2	..	..	..	..	..	..	..	2
Losses by gaming	1	..	..	..	..	..	..	..	1
Melancholy and absence of mind	10	11	4	7	2	..	1	1	36
Disgust of life	2	..	..	..	..	..	..	..	2
Conjugal quarrels and domestic grief. . . . .	..	..	1	1	..	..	..	..	2
Vexations and troubles in business	1	..	..	..	..	..	..	..	1
Disappointed ambition . . . . .	..	..	1	..	..	..	..	..	1
Inclination to drinking . . . . .	..	..	..	..	1	..	..	..	1
Despair in consequence of unintentionally killing a friend	1	..	..	..	..	..	..	..	1
Not ascertained	8	3	..	..	..	..	..	..	11
	35	26	21	9	4	2	2	1	100

I conclude herewith my communications. However much, perhaps, many readers may have wished for further details and more accurate statements, yet the limits allowed by the confined space of this *Journal* must be attended to. It was in general only my

design for the present to draw attention to the experience which has been gathered by the Life Assurance Bank of Gotha in vital statistics, and to communicate some essential points from them. These observations will be subjected to a more accurate and detailed scientific treatment when they have acquired greater extension, and furnished richer materials to give them a higher degree of certainty. Not till then will we attempt to construct from them a table of mortality, for which the observations up to the present time, especially respecting the younger and higher ages, have not yet furnished sufficient facts. It would, indeed, be possible to compute a table of mortality founded upon the results above, with the help of certain mathematical methods, but the want of sufficient facts cannot be supplied even by the most skilful mathematical method.
