Generations of men, under all circumstances, die at all ages; but the proportions vary indefinitely under different conditions from a slight tribute to death each year, down to the point of extermination by pestilence. If we ascertain at what rate a generation of men dies away under the least unfavourable existing circumstances, we obtain a standard by which the loss of life, under other circumstances, is measured; and this I have endeavoured to determine in the Life Table of Healthy English Districts. And recollecting that the science of public health was almost inaugurated in England by a former president of this society (Sir John Pringle), who encouraged and crowned the sanitary discoveries of Captain Cook, I feel assured that it will receive with favour this imperfect attempt to supply sanitary inquirers with a scientific instrument.

HEALTHY DISTRICTS.—Population, 1851. Deaths in the Five Years 1849 to 1853. Average Annual Mortality per cent.

Ages.	Population.			Deaths.			Average Annual Mortality to 100 living (*m*).		
	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
All ages -	996,773	493,525	503,248	87,345	43,736	43,609	1·753	1·772	1·733
Under 5 -	130,635	65,700	64,935	26,361	14,282	12,079	4·036	4·348	3·720
5— -	122,406	61,733	60,673	4,209	2,080	2,129	·688	·674	·702
10— -	110,412	56,651	53,761	2,377	1,087	1,290	·431	·384	·480
15— -	181,339	90,066	91,273	6,603	3,113	3,490	·728	·691	·765
25— -	136,892	65,422	71,470	5,869	2,675	3,194	·857	·818	·894
35— -	108,056	52,734	55,322	5,208	2,447	2,761	·964	·928	·998
45— -	85,244	42,383	42,861	5,252	2,698	2,554	1·232	1·273	1·192
55— -	62,857	31,105	31,752	7,001	3,568	3,433	2·228	2·294	2·162
65— -	39,453	18,860	20,593	10,313	5,173	5,140	5·228	5·486	4·992
75— -	16,737	7,718	9,019	10,297	4,946	5,351	12·304	12·817	11·866
85— -	2,614	1,097	1,517	3,581	1,555	2,026	27·399	28·350	26·711
95 & upwards.	128	56	72	274	112	162	42·813	40·090	45·000

The Healthy District Life Table was constructed in 1859 from the Census enumeration of 1851 and from mortality observations extending over the five years 1849 to 1853 in 63 districts of England and Wales which showed during the ten years 1841–50 a mean annual death-rate not exceeding 17 per 1,000 persons living. It has been found by experience that this Healthy District Life Table expresses very accurately the actual duration of life among the clergy and other classes of the community living under favourable circumstances.—("On the "Construction of Life Tables, illustrated by a new Life Table of the "Healthy Districts of England," in the Transactions of the Royal Society, 1859, pp. 838–41.)

CONTENTS

OF

PART VI.—MISCELLANEOUS.

PART VI.—MISCELLANEOUS.

Introduction.

The selections embraced by the Parts devoted to Population, Marriages, Births, Deaths, and Life Tables have occupied so large a portion of the available space in this volume that the selection from Dr. Farr's writings in other branches of statistics has necessarily been very restricted.

The first section of this Miscellaneous Part deals with sickness and health insurance. The social and public-health aspects of sickness invest with unquestionable interest and importance all trustworthy statistics bearing upon this subject. The scarcity of such statistics, and the difficulties of even defining practically and satisfactorily the term sickness, are discussed in the extracts given in this section. As there is no national system of registration of sickness, Dr. Farr had to content himself with the best available information from independent sources for that portion of his article on Vital Statistics in McCulloch's British Empire dealing with this subject, from which several extracts are printed in the following pages. These independent sources included friendly society returns, and returns of sickness among dockyard labourers, labourers in the East India Company's service, and in the metropolitan police force. Sickness returns, apart from their value as a complement to returns of mortality, supply the only trustworthy basis for the calculation of tables for health insurance, or rather for sick-pay allowances. The national importance of health insurance, both from a social and political standpoint, was fully appreciated by Dr. Farr, who strongly advocated the advisability of establishing a government system of health insurance; partly on the ground that the financial condition of so many friendly societies was far from satisfactory, thus tending to check this form of thrift in the working classes, which, if fully developed, would materially reduce the expense of poor-law relief. Recent legislation has given a more healthy financial tone to friendly societies, but the condition of many of them is still far from satisfactory, and the position of not a few borders on bankruptcy, threatening disastrous loss to members whose contributions have been paid out of hardly-earned wages.

The Registrar General's educational statistics, based upon the steadily declining proportions of signatures by mark in the marriage Register, afford trustworthy and thoroughly impartial evidence of the improvement of elementary education during the past half century. Dr. Farr initiated this branch of statistics in the early days of civil registration, and there are few of the first 40 Annual Reports of the Registrar General that do not contain pertinent comments on this subject. A selection from these comments appears in the following pages; and for the benefit of those whose interest in the subject may lead them to wish for further acquaintance with these statistics, it may be worth noting that in the 31st Annual Report, on pp. xxxvi–xliv, will be found a reprint of a larger selection of these comments than could be provided for in this

volume. It was not unreasonably claimed for these statistics, and the repeated deductions therefrom, that they "incidentally helped to "strengthen the movement in favour of State education for the poor," which bore fruit in the Education Act of 1870.

The third section of this Part contains a few extracts bearing upon the history and defects of civil registration of marriages, births, and deaths, and upon the improvements and changes therein effected by the Births and Deaths Registration Act of 1874.

The remaining sections contain selections from contributions upon the "Cost and Economic Value of Man," on "Risk of Fatal Railway "Accidents, and Insurance against Death or Injury through Railway "Accidents," and on "Family Nomenclature in England."

A reference to the biographical sketch of Dr. Farr at the commencement of this volume will show that from a considerable proportion of his work no extracts have been selected for these pages. The intention of those who initiated and carried out the proposal to publish this memorial volume was to make it as far as possible a storehouse of the facts and principles concerning Vital Statistics deduced and enunciated by Dr. Farr in the course of his laborious and useful career. With this object in view it was inevitably necessary to confine the selection as far as possible to those works which most intimately and directly dealt with that subject. This, and no want of appreciation for other work of Dr. Farr's pen, has led to the exclusion of much matter of undoubted interest and value, although not distinctly bearing upon pure Vital Statistics.

EDITOR.

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1. SICKNESS, AND HEALTH INSURANCE.

Relation of Sickness to Mortality.—It appears that in manhood, when 1 person in 100 dies annually, 2 at the least are constantly sick; and although this exact relation is, perhaps, not preserved in infancy and old age, or where the rate of mortality deviates much from the standard, it may be safely assumed as an approximation to the truth. Admitting, then, that the annual mortality is 2·19 per cent., after the corrected returns, and that the population of England and Wales is at present (1846) 17,000,000, the total number constantly disabled by sickness will amount to 744,600 persons; and if the same proportions be extended to Scotland and Ireland, to 1,247,000. This reduces the efficient population of the empire 1-23rd part; and the productive power, as far as it depends on human labour, 1-15th part, if the maintenance and attendance of the sick cost half the produce of their labour in health:* an example will show how it would be erroneous to suppose that two populations, in which the same absolute proportion of sick existed, suffered consequently to an equal extent. Two-fifths of the registered deaths occur below 5 years of age, yet the mortality in England has latterly (1841) not been more than 63·5 per 1,000 at this early age: in Sweden it was (1755-75) 90·1 per 1,000; and it is probable that at the same period the mortality of infants in England was not a great deal lower than in Sweden; so that, if sickness have diminished at the same rate, the proportion of infants constantly ill is not by one-third so great as it was

* In the English provincial hospitals the maintenance and the drugs administered to each patient cost 1*s.* 5*d.* daily; in Paris, 1*s.* 5½*d.*; in London considerably more. —(*British Medical Almanac*, p. 118.)

a century ago. But children being entirely helpless, and in no way contributing to the nation's actual strength, a diminution of sickness among them, however desirable, adds little immediately to national power and happiness, compared with an improvement in the health of adults, between the ages of 15 and 60 years, such as has been observed in London since the 16th century, when the destructive epidemics ceased.

The magnitude of the subject, and the fact that a million and quarter of the inhabitants of the United Kingdom are disabled by disease and suffering, is of less importance than the consideration that their condition may be vastly ameliorated. In one class of districts the mortality of boys below 5 years of age, is 145 in 1,000, in another 48 in 1,000: between the ages of 15 and 55 it varies from 18 to 11, implying a difference of 14 men constantly sick in 1,000 living. In the former districts about 36, in the latter 22, are constantly suffering from disease, and absolutely disabled from labour. If the population of the United Kingdom, and the adjacent islands (28,487,000), were as unhealthy as that of Liverpool and Manchester, 1,937,000 would be ill, and 968,500 would die annually; whereas if the whole people enjoyed as good health as the inhabitants of other parts of England, only 1,026,000 would be constantly ill, and only 513,000 would die annually on an average. In the former case, the mean duration of life would be 25 years, in the latter 45 years. Whether it be possible or not to raise the standard of health to the height enjoyed in the healthiest counties, or to one still higher, the importance of the subject recommends it to a careful experimental investigation; because, when the character and causes of our diseases are known, some provision may be made for their alleviation; the extent of the injuries which they inflict upon the public will be determined; and the standard of salubrity, indicating an increase or diminution of physical strength, will afford the best index of the prosperity of the nation, and of the extent to which it is affected by atmospherical, political, or economical influences. (McCulloch's Account of the British Empire, Article "Vital Statistics," Vol. II., pp. 542-3.)

Sickness and Mortality at various Ages, and from different Diseases.—The rate of mortality declines as age advances from birth to puberty, and then increases according to certain determinable laws. The mortality decreases to the age of puberty, and then increases somewhat slowly to between 50 and 60. After the age 55 the mortality increases at such a rate that it is doubled for females every 8·24 years in the healthy districts, and every 8·95 years in England and Wales. At the ages 20–50 the mortality of females increases one sixth part for every 10 years of age in the healthy districts, and so would not be doubled at that rate in less than 47 years. In England the mortality of females (20–50) increases nearly one fourth part every 10 years of age; the mortality of males (20–40) increases somewhat faster, and from 40 to 50 the increase is intermediate between that of the previous age and the future, which may be called the final age increase-rate.

It may now be shown that there is a certain relation between the number of deaths by any disease and the number of attacks by that disease. Some diseases are fatal to nearly every one they attack, and so they can occur but once in a lifetime: such are hydrophobia, glanders, cancer, tetanus, tabes mesenterica, phthisis, hydrocephalus, softening of brain, some heart diseases, aneurism of aorta, angina pectoris, ascites, ileus, perforation of intestine, ischuria, Bright's disease, Addison's disease, diabetes, ovarian dropsy (without operation), cyanosis, fractures

of base of skull, wounds of vital parts; extensive burns; poisoning by high doses of prussic acid, strychnia, and other poisons, solid, liquid, and gaseous; submersion under water for a few minutes; suffocation. Every death here represents one case of disease or injury. As medicine affords alleviation but cannot cure, their prevention is the great end to be aimed at.

Apoplexy and paralysis are fatal generally after two or three attacks.

Then there are two other great *classes* of diseases; (a) one is fatal to a certain number of the attacked, and (b) the other causes inconvenience, but is not fatal.

Of the first class, certain diseases, as a general rule, attack a patient only once, and that in early life; such are small-pox, measles, scarlet fever, whooping-cough, enteric fever. The deaths imply a number of attacks varying with age: thus it has been shown that the mortality was such in the London Small-pox Hospital, that there was 1 death to 2·44 cases in children under 5 years of age; 1 in 2·93 at the ages 20–30; and in the two next decenniads 1 in 2·15 and 1 in 1·71.* According to a report of the Committee of the Metropolitan Asylum District, 1872, the mortality from small-pox after the age of five was half as high, but increased in the three decenniads of age 20–50; it increased at the same rate, the deaths being 1 in 5·98, 1 in 4·22, and 1 in 3·40 among the vaccinated and unvaccinated taken indiscriminately; the mortality of the unvaccinated being much higher than the mortality of the vaccinated. So the mortality from cases of fever has been shown to increase with age.

When the cases to one death at the respective ages have been determined, the attacks from each disease can be calculated from the deaths by that disease in the expanded life table (pp. xciv-v of this Report).

The mortality of the cases of cholera in London, 1854, was such, that to one death there were only 2 cases; but the death-rate ranged with age from 1 in 1·36 to 1 in 2·86.† Then the contemporaneous epidemic of diarrhœa was not by a thirtieth part so fatal; there was, taking all ages, one death in 61 cases: in children under 5 *one* death in 17 cases; in adults of 35–45 only *one* death in 199 cases; the mortality in old age increasing rapidly. By applying the proper factors the attacks of cholera or diarrhœa are calculated from the deaths.

There is a peculiar class of the sometimes fatal diseases that are recurrent; such are intermittent fever, remittent fever, neuralgia, rheumatism, gout, epilepsy, asthma; one attack, far from precluding, facilities another apparently, so that one death may represent several attacks by the same disease of the same person.

Among the diseases to which the deaths give little or no clue, because theh are rarely or ever fatal, may be reckoned chicken-pox, cow-pox, febricula, mumps, gonorrhœa, primary syphilis, epistaxis, varicose veins, nævus, toothache, tonsillitis, dyspepsia, worms, hæmorrhoids, gastrodynia, hydrocele, orchitis, paramenia, flat feet, obesity, corns, skin diseases of various kinds, slight wounds and injuries.

A vast amount of incapacity in the army arises from these causes; and the necessity of recording the cases of diseases, both fatal and not fatal, is evident. But it is to be borne in mind that a death is a much more evident thing than attacks of disease varying indefinitely in intensity. The death returns are the basis of all sanitary statistics. (Supplement to 35th Annual Report, pp. xxxv–vi.)

* M'Culloch's Account of the British Empire, vol. 2. Article, "Vital Statistics," p. 594.

† Report of General Board of Health, Committee of Medical Council on Cholera Epidemic of 1854.

Early Sickness Tables.—A Bill, embodying a plan for enabling the labouring poor to provide support for themselves in sickness and old age, by small weekly savings from their wages, was introduced by Mr. Dowdeswell, and approved by the House of Commons, in 1773; but it met with the same fate as another Bill framed by the Commons in 1789, and founded on tables computed, at the request of a committee, by Dr. Price. The Lords rejected both Bills; and thus deprived the labouring poor of the guidance of a legislative Act in the formation of friendly societies for half a century. The tables of sickness, computed for the first Bill, were published by Baron Maseres in the second volume of his *Treatise on the Doctrine of Life Annuities:* Dr. Price's tables, which have till latterly been in general use, were published, in the edition of his work on Annuities, by Mr. Morgan. These tables were founded partly on observations and partly on an ingenious hypothesis: no extensive observations were ever made to determine the average time of incapacitation from labour produced by sickness, till the subject was taken up and investigated by the Highland Society (1824). Since then two committees of the House of Commons have sat on benefit societies, and the subject has obtained more attention. (McCulloch's Account of the British Empire, Vol. II., Article "Vital Statistics," pp. 570–1.)

Definition of Sickness.—Sickness, in practical statistics, is employed in a general sense. If we consider man as a material body, acting intelligently, anything in the condition of the body itself, which interrupts or impedes that action, is sickness. Any disturbance in the functions of the body, or alteration in the organs by which they are executed—from the skin to the brain and spinal marrow—from the time the food enters the mouth, till it exhales from the skin and lungs in vapour and gas—is a disease: and the sum of sick-time, produced by all diseases, constitutes the sickness of which statisticians speak. It is of various kinds. In acute or severe diseases, such as fever, inflammation of an important part, or malignant ulcer, a man is often able to think and move, just as he can digest a small quantity of food; but not with any energy, or at least with the energy required by an ordinary occupation. Any attempt at exertion aggravates and prolongs the sickness. This, we believe, is called *bedfast* sickness by the friendly societies. In other chronic diseases, slow inflammations of internal organs, reduced dislocations, rheumatisms, ulcerations, the patient can attend partially to his business: he is in possession of half his faculties; whether he can make them in any way available depends on circumstances. This is walking sickness. The infirm, the crippled, the maimed, may either be entirely helpless and bedridden, or capable of some of the duties of life: their sickness differs from the bedfast, and from the walking, in being beyond the pale of recovery. The Highland Society calculated that of ten weeks' sickness, among persons of all ages under 70, two may be assumed as bedfast sickness, five as walking, and three as permanent.* (McCulloch's Account of the British Empire, Vol. II., Article "Vital Statistics," pp. 571–2.)

Sickness in Friendly Societies.—The following table of sickness, from the *British Medical Almanac*, presents a comparative view of the mean proportion of sickness incidental to members of English and Scotch benefit societies; according to (1.) the observations of the Highland Society; (2.) returns obtained by Mr. Ansell, and published in his work by the Society for Promoting Useful Knowledge; and (3.) a table of

* Report of Friendly Societies, by a Committee of the Highland Society, p. 108.

Mr. Edmonds's, agreeing very nearly with Dr. Price's, at one time in general use :—

PROPORTION of SICK out of 100 Living at different Ages in Friendly Societies.

Between Ages.	Sick Time in 100 of Life Time.			Between Ages.	Sick Time in 100 of Life Time.		
	Scotch Benefit Societies.	English Benefit Societies.	Theoretical Table by Mr. Edmonds.		Scotch Benefit Societies.	English Benefit Societies.	Theoretical Table by Mr. Edmonds.
20 to 30	1·14	1·54	1·72	70 to 80	31·70	32·50	..
30 — 40	1·32	1·83	2·30	80 — 90		40·00	..
40 — 50	1·97	2·56	3·10	90 — 95		67·00	..
50 — 60	3·60	4·32	4·51				
60 — 70	10·80	11·26	9·36	All Ages	2·45	2·76	..

These observations show, that, in the different circumstances, 1·32, 1·83, and 2·30 men in 100, between the ages of 30 and 40, were constantly ill: the sick-time increasing regularly with age. It is easy to deduce from this table the average days of sickness to each individual.

These Scotch and English observations represent, so far as limited numbers can, the sickness to which men, who are healthy at the time of entering benefit societies, are subsequently liable: the general proportion of sickness is higher. Tables of sickness for the entire population would be formed by taking 100,000 persons, of given ages, indiscriminately, and observing them for one, two, three, &c., years, they would consequently comprehend 4,000 and 5,000 individuals sick when the observation commenced expressly excluded by the rules of benefit societies, as well as those suffering from syphilitic diseases and accidents incurred through drunkenness or brawls. In the parish of Methven, Perthshire, it was ascertained that 35 out of 743, or 4·7 per cent. of the male population above 15, would, from bodily or mental infirmity, not have been admitted as members of the friendly societies.* Medical men are well aware that labourers often go about their work with diseases of the heart, tubercles in the lungs, and disorders of considerable severity. Dr. Forbes ascertained, by the personal examination of 120 Cornish miners, in actual employment, that only 63 had good health; of the remaining half, 26 had difficulty of breathing, 14 pain of chest, 10 pain of stomach and bowels, 5 lumbago, pain of shoulder, palpitation, scrofula, or fits.† Out of 115 children below 18 years of age, Dr. Bisset Hawkins states, that 84 had good health; 25 middling health; 6 bad health. Of the miners at work only 53, of the factory children only 73 per cent., enjoyed good health. How much sickness exists among the actual labourers of this country, independently of those definitely incapacitated by disease, and who are either discharged on this account or set aside as inefficient, there are no satisfactory statistics for determining. (McCulloch's Account of the British Empire, Article "Vital Statistics," pp. 571–2.)

We are indebted to Mr. Neison for a most important contribution to vital statistics, in the shape of an inquiry into the sickness and mortality experienced among the members of friendly societies. The data, published in detail by Mr. Neison, have been derived from two sources. One portion, relating to the friendly societies of England, was obtained

* Report of Friendly Societies, by a Committee of the Highland Society, p. 280.

† Medical Topography of Penwith, Cornwall, by J. Forbes, M.D.; Trans. of the Medical Association, vol. iv. p. 187.

through Mr. Tidd Pratt; and consists of the quinquennial returns for 1836–40, made under the Friendly Societies Act, 10 Geo. IV., c. 56. s. 34, as amended by 4 and 5 Will. IV., c. 40, s. 6. The other portion was procured by Mr. Neison himself from the friendly societies of Scotland. The abstracts, made under his supervision, and at his own expense, have been liberally communicated to the public. They are the most extensive returns of the kind extant; and the results are of the greatest practical importance.

The returns of sickness and mortality are separately given for the rural, town, and city districts of England and Scotland. They will be found in a condensed form in the annexed tables.

The sickness returned in these tables is much higher than that given in the previous returns of the Highland Society, and of Mr. Ansell. Thus the amount of sickness experienced in the 30 years of age, from 20 to 50, is by the Highland Society's returns 22 weeks, Ansell's 31 weeks, Neison's 33 weeks; from the age of 30 to 60 it is 34 weeks, 45 weeks, and 52 weeks in the respective returns. From 20 to 60 the sickness does not differ materially from that experienced by the East India Company's labourers.*

SICKNESS in FRIENDLY SOCIETIES according to various Returns.

Ages.	Average Number constantly Sick to 100 living at each Age.				
	Friendly Societies.				East India Company's Labourers.
	Scotland. (Highland Society.)	England. (Ansell.)	Scotland. (Neison.)	England. (Neison.)	
20-30	1·14	1·54	1·65	1·69	1·62
30-40	1·32	1·83	1·66	1·91	2·06
40-50	1·97	2·56	2·44	2·89	2·69
50-60	3·60	4·32	5·17	5·21	6·58

The Society of Odd Fellows had, in the year 1844, nearly a quarter of a million of members. The Board of Directors, at Manchester, procured a return in 1845, of which Mr. Neison gives the following analysis :—

ANALYSIS of RETURNS made to the MANCHESTER UNITY OF ODD FELLOWS for the Year 1844.

District.	Average No. of Members during 1844.	Deaths of Members.	Deaths of Members' Wives.	No. of Weeks' Sickness.	No. of Members out of which		Average Sickness Yearly to each Member expressed in Weeks.
					One Member died.	One Member's Wife died.	
Rural - -	66,208	608	434	57,795	108·89	152·55	0·873
Town - -	77,070	700	554	70,435	110·10	139·01	0·913
City - -	99,818	978	662	98,687	102·09	150·83	0·988
Whole Unity -	243,126	2,286	1,650	226,917	106·35	147·34	0·933

* See extract on pp. 508–11.

In explanation of the above table, it may be stated that the rural district is composed of those places the population of which is under 5000, the town district of those places the population of which is 5000 and under 30,000, and the city district of such places as have a population of 30,000 and upwards.

During the year 1844, it will be seen that the mortality for the whole Unity was, as already stated, about 1 to every 106 members; while for the rural districts it was 1 in 109, for the town districts it was 1 in 110, and for the city districts it was 1 in 102. The average amount of sickness to each member is 6½ days*.

The contributions in the Odd Fellows Society appear to be inadequate to secure a member the advantages which they promise for any length of time, under an economical management; and it would appear, that the expenses are at present extravagant. The income in 1844 was 325,200*l.*; the expenditure 241,604*l.*; the sum paid to sick members was 107,440*l.*; for funerals, district, and widow and orphans' funds, 62,743*l.*; and sundries 71,421*l.*! The average age of the members is 32 years; and to secure 10*s.* a-week in sickness, 10*l.* at the death of a member, and 5*l.* at the death of a member's wife, the annual payment should, according to Mr. Neison's computation be 1*l.* 14*s.* 5*d.* The actual sum demanded according to the new scale, No. 1, is 1*l.* 2*s.* 9*d.* This is irrespective of 5*s.* or 6*s.* a-year in "Sundries" to each member. The premiums of those societies are not graduated according to age. Upon the whole they exhibit, amidst much good feeling, a want of knowledge, calculation, and foresight—which must involve the managers in discredit and the members in deep distress, unless an immediate and effective reform be carried out in all the lodges. The contributions must be raised and graduated, the expenses cut down to the narrowest limits.

In 1834 the number of members in the order was about 60,000, at the beginning of 1846 the number was 251,727. The entrance fees in 1844 amounted to 49,382*l.*, so that upwards of 40,000 members were initiated in the year; and as the increase of members was only 21,461 in that year, "upwards of 20,000," say the directors, "must "have left the order after paying their initiation money and contribu- "tions for a length of time." This, although it neither denotes stability nor confidence in the order, is a large source of revenue; which may be taken into account in estimating the resources, and fixing the premiums.

Reverting to the tables of returns from other societies, it will be observed, that nearly one-third of the members are between the ages of 30 and 40; the greatest number appear to enter between the ages of 20 and 30; but new members come in at 30 and 40 and greater ages. The returns for England are from an average number of 229,449 members observed 5 years (1836–40), those for Scotland only from an average of 5,879 members for 12 years (1831–42). Nearly six-tenths of the English, and seven-tenths of the Scotch members belonged to "rural" societies; the remainder to societies in towns and cities. The mortality in all the societies was comparatively low; in the Scotch higher than in the English; and in the whole not higher than in Surrey, one of the healthiest English counties. The mortality under 30 in England and under 20 in Scotland, was somewhat higher in the rural than in the town societies; after those ages the mortality was considerably higher in the towns and cities than in the country; thus, in England, of 149,210 members of the age 40–50 only 1,378 died, while 1,520

* Observations on Odd Fellow and Friendly Societies, by F. G. P. Neison, F.L.S., and Actuary to the Medical and Invalid Life Office.

members died in the town and city societies out of 107,286 members. The mortality in the country was ·924, in the towns 1·417 per cent. annually. The mortality in Scotland at the same age, 40–50, was ·997 per cent. in the rural, 2·097 in the city and town societies. The higher mortality in the towns, Mr. Neison appears disposed to ascribe to occupation, and the different "physical exercises" to which the several "classes of society" are "habituated."* We cannot agree with him. That "physical exercise" and occupation have an effect on the mortality is admitted on all hands; but Mr. Neison should not have forgotten at the moment he was writing, that the excess of mortality in towns among children under 5 years of age, and among women is as great or greater than any he has discovered among the artizans and labourers belonging to friendly societies. From the age of 10 to 60 there were in England to every annual death from 2·3 to 2·7 members constantly on the sick fund. The mean of the 5 decennial periods is 2·5 years of sickness to every death; or in other words 2·5 members constantly sick to *one* death in a year. The ratio of the numbers receiving relief to a death is least at the age of 30–40; when the earnings of a man are greatest, and the calls on him from a dependent family are most urgent; at a period, therefore, when the *difference* between "wages" and "sick-pay," and his indisposition to forego this difference, are at a maximum. We have seen that many artizans are constantly at work while labouring under severe—to say nothing of slight illness; and it is evident, that the illness, lameness, or infirmity, which incapacitates a policeman from doing duty, or from walking 20 miles a-day, would scarcely prevent a tailor and weaver, from plying the needle and shuttle. Instead of inferring from the facts, as Mr. Neison appears disposed to do, that *sickness* and *mortality* are not connected together "as cause and effect;" we should lay it down as a principle, not true, but somewhat the less paradoxical of the two, that there is no connexion between the time men of different trades in friendly societies are in the receipt of sick-pay and the actual sickness which they experience. The variable extent to which equal degrees of sickness are likely to throw artizans of different trades on the sick fund, should be borne in mind, in advising societies, consisting of two or three prevailing professions. The mortality is greater, the sick-time less in the Scotch than in the English societies; we do not know whether this is connected in any way with the cholera, which was epidemic in the period over which Mr. Neison's Scotch returns, and not in that over which his English returns, extend. An epidemic like cholera, in which the cases are of short duration and fatal, would account for the anomaly in the Scotch returns, which are little more than four-tenths in extent of those returned by English societies. At the age of 60 and 70, when the earnings are inconsiderable, and infirmities gain ground on the strength, there are *four* or *five* constantly on the sick and pension fund to one annual death; the whole of the illness experienced probably appears in the returns; and much that in earlier life would be shaken off, or not be called illness.

The members of friendly societies are selected men, and do not exhibit either the mortality or sickness of the classes from which they are taken. Yet we are inclined to think the mortality of the members still understated; and that like the sick-time, it will be found to increase with the successive returns. This may be put to the test by analysing the returns for the 5 years 1841–5; which are probably, in conformity with the Act of Parliament, now at the Home Office or the House of

* Con. to Vital Stat., pp. 109, 110.

Commons. The numbers who enter and leave the societies at each age should also be ascertained. The following are interesting tables, showing the mortality and sickness rates in friendly societies, and the average duration of attacks of sickness.

Age.	Rural, Town, and City Societies.			Rural Societies.			City and Town Societies.		
	Population or Years of Life.	Deaths.	Sickness. In Weeks.	Population or Years of Life.	Deaths.	Sickness. In Weeks.	Population or Years of Life.	Deaths.	Sickness. In Weeks.
9	65	—	30	50	—	11	15	—	19
10	34,367	217	28,243	23,145	163	19,283	11,222	54	8,955
20	276,984	1,972	244,885	181,595	1,310	158,566	95,389	662	86,319
30	365,471	3,067	364,074	213,994	1,586	194,842	151,477	1,481	169,232
40	256,496	2,898	387,336	149,210	1,378	188,302	107,286	1,520	199,034
50	138,257	2,635	375,705	84,687	1,400	199,421	53,570	1,235	176,284
60	55,828	1,972	428,870	39,458	1,249	301,075	16,370	723	127,795
70	17,046	1,289	356,791	12,805	884	261,343	4,241	405	95,448
80	2,611	335	76,378	1,832	213	47,423	779	122	28,955
90	115	5	2,120	107	2	1,770	8	3	350
100	3	—	—	3	—	—	—	—	—
Total	1,147,243	14,390	2,264,432	706,886	8,185	1,372,041	440,357	6,205	892,391

Age.	Annual Mortality per Cent.			Constantly Sick in 100 Members.			The constantly Sick, and the Years of Sickness to one Annual Death.		
	Rural, Town, and City Societies.	Rural Societies.	City and Town Societies.	Rural, Town, and City Societies.	Rural Societies.	City and Town Societies.	Rural, Town, and City Societies.	Rural Societies.	City and Town Societies.
9	—	—	—	—	—	—	—	—	—
10	·631	·704	·481	1·575	1·597	1·529	2·494	2·268	3·178
20	·712	·721	·694	1·694	1·673	1·734	2·380	2·320	2·499
30	·839	·741	·978	1·909	1·745	2·141	2·275	2·354	2·190
40	1·130	·924	1·417	2·894	2·419	3·555	2·561	2·619	2·509
50	1·906	1·653	2·305	5·208	4·513	6·307	2·733	2·730	2·736
60	3·532	3·165	4·417	14·722	14·623	14·961	4·168	4·620	3·388
70	7·562	6·904	9·550	40·114	39·114	43·132	5·305	5·666	4·517
80	12·830	11·627	15·661	56·061	49·609	71·234	4·369	4·267	4·548
90	—	—	—	—	—	—	—	—	—

Age.	English Friendly Societies.			Scotch Friendly Societies.		
	Days of Sickness in a Year to One Member.			Days of Sickness in a Year to One Member.		
	Rural, City, and Town Societies.	Rural Societies.	City and Town Societies.	Rural, City, and Town Societies.	Rural Societies.	City and Town Societies.
10	6	6	6	6	6	5
20	6	6	6	6	6	7
30	7	6	8	6	6	7
40	11	9	13	9	8	11
50	19	16	23	19	18	21
60	54	53	55	50	50	49
70	147	143	158	150	147	165
80	205	181	260	216	208	264
90	—	—	—	236	—	263

Members of the age of 20 and under 30 had, on an average, six days of sickness annually—or they received pay for six days of every year that they were entitled to pay.

AVERAGE DURATION OF ATTACKS OF SICKNESS. (From Returns of Scotch Friendly Societies, framed by G. P. Neison, Esq.)

Age.	Total Number of Attacks, including those ending in Recovery and those ending in Death.	Total Amount of Sickness, including that ending in Recovery and that ending in Death.	Average Duration of each Attack of Total Sickness, including that ending in Recovery and that ending in Death.
		Weeks.	Weeks.
10–15 - -	12	39·428	3·286
15–20 - -	117	749·571	6·407
20–25 - -	637	2830·285	4·443
25–30 - -	985	5483·000	5·566
30–35 - -	1,074	5014·143	4·668
35–40 - -	872	4524·714	5·188
40–45 - -	758	4158·714	5·486
45–50 - -	519	3445·714	6·639
50–55 - -	537	6634·285	12·354
55–60 - -	491	7171·571	14·606
60–65 - -	350	9102·286	26·004
65–70 - -	135	5934·714	43·960
70–75 - -	116	8867·999	76·448
75–80 - -	29	4588·857	158·236
80–85 - -	19	4027·000	211·947
85–90 - -	—	—	—
90–95 - -	1	353·000	353·000
	6,652	72925·281	10·957

(McCulloch's Account of the British Empire, Article "Vital Statistics," Vol. II., pp. 581–6.)

Sickness among Dockyard Labourers.—The following tables are based upon returns relating to the labourers employed in Portsmouth Dockyard during the three years 1830–1–2, showing the numbers employed, and the cases and causes of absence from work.

Years.	Average Number of Men.	Number of Cases.		Days of Sickness from Disease.	Days of Sickness from Injuries.	Total Days of Absence from Work.
		Diseases.	Injuries.			
1830 -	2,079	697	357	9,188	5,884	15,072
1831 -	2,002	888	325	9,605	4,620	14,225
1832 -	1,867	665	329	8,617	5,086	13,703
Total in 3 years	5,948	2,250	1,011	27,410	15,590	43,000

This table furnishes, as the mean of the three years, the following interesting results. In the year, 1 man in 6 is seriously hurt; 2 in 5 fall ill. Each man, on an average, has an attack of illness, either spontaneous or caused by external injury, every 2 years; and, at an average, each disease lasts 14 days.

So far as the returns from the other dockyards can be understood and admit of comparison, they confirm these results; and between Woolwich and Portsmouth, where hurts and sickness are distinguished, there is a remarkable coincidence in the time lost by sickness, although that from injuries is very different.

TIME LOST by SICKNESS from DISEASE or INJURY among LABOURERS in PORTSMOUTH and WOOLWICH DOCKYARDS.

——	Mean Number of Workmen.	Days Lost by Sickness.	Days Lost by Accidents.	Constantly Sick, per Cent.	Constantly suffering from Accidents, per Cent.	Constantly Ill from both Causes, per Cent.
Portsmouth	5,939	27,410	15,590	1·26	0·73	1·99
Woolwich -	2,243	10,593	8,594	1·29	1·05	2·34

It may be safely assumed that of the labourers employed in the dockyards 2 per cent. are constantly kept at home by diseases or injury; and that diseases, independent of external mechanical injury, constitute almost two-thirds of the entire sickness. No details or explanations accompany the original returns; but it may be presumed that the sickness only of the men who recovered, and returned to the dockyards, is intended in the tables, and this, with the selection on entering, excludes the greater proportion of sickness prevailing in a population, although it expresses that experienced by the actually working class. The sickness of the working labourers in the East India Company's service was, we shall show, 1·65 per cent.; and this is little more than a fourth part of the entire sick-time experienced by the whole number employed, including those pensioned. This proportion would make the sick-time of the dockyard labourers 7·8 per cent. of the lifetime.—(McCulloch's Account of the British Empire, Article "Vital Statistics," pp. 572–4.)

Sickness among Labourers employed by the East India Company in London, 1823–34.—A return of the state of health among the men employed by the East India Company in London deserves especial attention, as no observations so accurate or extensive have before been published, relative to the sickness and mortality among labourers in large cities. This return was obtained "in the form of a large volume, "containing a list of 2,461 labourers, employed in the month of April, "1823, with a statement of the number of days' illness experienced by "these labourers, one by one, year by year, for the 10 succeeding years; "also the date of every death, and the date when any labourer ceased to "be employed, by being superannuated and pensioned, dismissed, or by "voluntarily leaving the service of the Company."*

Every labourer put upon the sick list is allowed 1*s.* 6*d.* a day, Sundays included; he is also seen every day by the surgeon, and therefore remains no longer absent than the case requires.

During the 10 years, 496 died, 248 were pensioned, and 208 left the service, or were dismissed. The reporter, Dr. Mitchell, has calculated

* Factories Inquiry; Supplementary Report by Dr. Mitchell, vol. i. p. 48.

a table of the duration of sickness per annum for every age, from 16 to 81, which we subjoin:

Age.	Average Duration of Sickness per Annum for every Man employed.	Average Duration of Sickness for every Man sick.	Age.	Average Duration of Sickness per Annum for every Man employed.	Average Duration of Sickness for every Man sick.
	Days.	Days.		Days.	Days.
Under 21	4·02	13·96	51 to 61	7·00	28·60
21 to 31	4·94	18·70	61 — 71	10·08	29·07
31 — 41	5·06	22·63	71 — 81	11·63	31·77
41 — 51	5·31	23·21			

Dr. Mitchell has unfortunately withheld the *data* from which these results were derived. He has not stated the total days' sickness, and attacks at each age, nor arranged the observations so as to exhibit the complete years of life. But the report contains tables showing the number of the men at every year of age, from 16 to 78, in the beginning of April 1823; the ages at which the 248 pensioners were put upon the list; and the ages at which the 496 men died whilst classed as workmen, as well as the ages at which 161 of the pensioners died. It appears that the deaths of the pensioners were obtained in a separate return, extending from April 1823 to January 1834, nine months over the ten years in which the other deaths happened. From these facts we first deduced the number living at each decennial period of life, on the supposition that the 2,461 individuals alive in 1823 remained in the service ten years; and thence subtracted the years of life lost by deaths and dismissals. Dr. Mitchell having omitted to state when or at what age the 208 men left the service, it has been assumed that the younger men left in rather greater proportion than the aged, but that all remained in the service five full years; which is the same as supposing the dismissals were equally distributed over the ten years. A similar correction was made for the deaths: 1–14th part was deducted from the deaths of pensioners for the nine additional months in which they were observed.

NUMBER of LABOURERS in the East India Company's Service, April 1823; from Ten Years' Observations, the NUMBER living complete Years between 16 and 90 years of age; the DEATHS among the WORKMEN and PENSIONERS; the Mortality compared with the Mortality among MALES in London.

Age.	Labourers.			Deaths.		Annual Deaths per Cent. among				
						Workmen.				
	On the Books, April 1823.	Living in One Year.	Living during One complete Year.	Of Workmen.	Of Pensioners.	Entire Number.	Attacked.	Pensioners.	All the Labourers.	Males, London, 1813–30.
16—20	31	48	33	..	..	..	..	..	..	..
20—30	437	2,301	2,066	16	1	·78	2·9	6	0·82	1·22
30—40	779	6,671	5,939	86	2	1·46	6·5		1·48	1·69
40—50	599	6,749	5,764	136	8	2·38	10·4	17·7	2·43	2·54
50—60	451	5,365	4,255	147	40	3·52	14·2		4·27	4·04
60—70	137	2,739	1,819	95	75	5·88	15·7	16·5	9·24	8·12
70—80	27	675	426·5	16	39	5·66	11·7		10·71	15·97
80—90	..	56	35·5	..	5	..	..	23·2	13·90	30·91
										33·84
	2,461	24,610	20,343	496	161	2·50	10·6	16·5	3·13	..

These observations are equivalent to observations on 20,343 men during one complete year, and between the ages of 30 and 70 are sufficiently extensive to furnish a near approximation to the mortality

in four decennial periods: earlier or later they are of little separate value. The annual rate of mortality was 3·13 per cent.; and, notwithstanding the selection, it agrees, between 40 and 60, very nearly with the general mortality of males in London (1813–30).

The mortality under 40 is not so high among the labourers, because the greater part of them are selected healthy men, received into the service between the age of 20 and 35; after 50 it is higher than the general mortality in London. These men were well supplied with food and clothing; their work, without being hard, insured regular muscular exercise; in sickness they had rest and proper medical attendance; yet, between 40 and 50, the mortality was 67 per cent., between 50 and 60, as much as 82 per cent. higher than the mortality at the same ages in all England. Such facts as these annihilate the supposition that the increased mortality in cities is due to want of food, and greater misery; nor, although these men drank freely, can we admit that their moral habits differed so greatly from those of country labourers as to account for their greater mortality.

Of the 2,461 labourers, 10 per cent. were pensioned in the course of ten years; 8 per cent. were discharged, or quitted the service; 1 man in 81 working a year was pensioned; 1 in 4 had an attack of sickness; 1 in 60 was constantly on the sick list; 1 in 21 (4·79 per cent.) of the labourers was a pensioner; and 1 in 6 of the pensioners died annually. The mean duration of life, after being pensioned, would therefore be six years; five years and a half less than the mean duration of life among the general class of men in cities at the same ages.* This, and the evidence of the medical attendant, Mr. Lewis Leese, prove clearly that the greater part of the pension-time must come under any comprehensive definition of sickness; the pensioners were declared by a special report of the surgeon, permanently disqualified for labour; and that not by age alone, for the majority were pensioned between the ages of 50 and 70, but by the mechanical injury of a limb, some infirmity, or a slow but fatal disease. Half the pension-time may therefore be safely viewed as sick-time.

SICKNESS, &c. STATISTICS of LABOURERS employed by the East India Company in London, 1823–34.

Ages.	Labourers Employed a complete Year.	Attacks of Sickness.	Days of Sickness.	Pensioned.	On the Pension List one complete Year.	Out of 100 Men Working One Year.		Sick in 100 Labourers.†	Of 100 Living.	
						Cases of Sickness.	Pensioned.		On the Pension List.	Sick, and on the Pension List.
16—20	33	10·9	152	..	..	28·5	..	1·10	..	1·10
20—30	2065	546·5	10,203	4	5·5	26·4	·20	1·36	·27	1·62
30—40	5907·5	1320·5	29,891	13	41	22·4	·22	1·38	·69	2·06
40—50	5703·5	1305·5	30,286	13	72	22·9	·23	1·46	1·25	2·69
50—60	4169	1020·4	29,183	76	199	24·5	1·82	1·91	4·70	6·58
60—70	1615·5	560	16,284	105	433·5	34·7	6·50	2·76	23·85	26·50
70—80	316·5	116	3,681	35	201	36·6	11·06	3·20	46·49	48·78
80—90	23	1?	35?	2	21·5	..	8·70	?	69·65	..
	19,838	4880·8	119,715	248	973·5	24·6	1·23	1·65	4·79	6·44
						1 in 4	1 in 81	1 in 60	1 in 21	1 in 15·5

* The expectation of life at the mean age when the 248 men were pensioned was 11·4 years, according to the city table of Mr. Edmonds.

† Obtained by multiplying the mean number working by the days of sickness experienced by one person: this sickness is a fraction higher than that given by Dr. Mitchell, as the days opposite 21-31, &c. in his table were applied to the numbers 20-30, &c. in this. He has improperly compared the 9th instead of the last column with the sickness of the Highland Societies, which comprehended every kind of incapacitation for labour.

The proportion attacked by sickness out of 100 men, at each age, working one year, differed inconsiderably between 20 and 60: the number pensioned between 20 and 50 was also the same (·0022); from 6 to 11 per cent. of the workmen were placed on the pension-list between the ages of 60 and 90; of the actually working class the sick-time increased with age from 1·1 to 3·2 per cent.; the pensioners, at the ages 60–70, formed 24, at 70–80 more than 46 per cent. of the living. The total sick-time (including pension-time) increased up to 50, in geometrical progression, at the rate of nearly one-third every ten years; and if half the pension-time after 60 be counted as sickness, it rather more than doubled in the subsequent decennial periods. The rate of sickness, including all the pension-time under 50 years of age, is much higher than that found by the Highland Society: it lies between the rate assumed by Dr. Price and the observations by Ansell on the English benefit societies.* There were rather more than two years of incapacitation for labour to each death. The deaths were to the sick and pension-time as 3·13 to 6·44.

Friendly societies, and companies who, like the East India Company, may deem it prudent to make their men subscribe to a sick and pension fund, will find these tables very valuable. They also throw great light upon the state of health prevailing in the metropolis: the mortality and other considerations show that these men, labouring in warehouses in the heart of the city, yet well provided for, occupy, as regards health, a middle point between the worst classes and the inhabitants of the cleaner and less crowded districts. (McCulloch's Account of the British Empire, Article "Vital Statistics," Vol. II., pp. 574–7.)

Sickness in the Metropolitan Police Force.—This was embodied in the year 1830, and had subsisted eight entire years at the end of the year 1838. The average strength of the force during the eight years was 3,314, the numbers being very nearly stationary throughout the whole period. In order to maintain the average strength of 3,314 men, it was found necessary to recruit annually as many as 1,100 new members, the vacancies being created by 1,068, who are removed or retire from the force, and 32 who die every year. The average duration of the service of each policeman is, consequently, three years. The average at which the men enter, is 28½ years; about two-thirds enter between the ages of 20 to 31, and the remainder, with a very few exceptions, enter between the ages of 31 and 35 years. The annual mortality was ·97 per cent. or very nearly 1 per cent. The average number constantly sick during the eight years was 2·81; or the days of sickness in a year to each man, were 10·3. For every annual death 2·90 were constantly sick, consequently there were nearly three years of sickness to every death. Out of 100 living, 3·78 were constantly sick in the month of January, and 2·38 in the month of July; the months of the year in which sickness was respectively at a maximum and minimum. The men are first chosen as being of sound and vigorous health, and the force is afterwards kept select by frequent discharges of men showing symptoms of impaired health or strength.

Each individual has to walk 20 miles every day in going his rounds, besides being obliged to attend charges at the police offices, the labour of which may be estimated as equal to walking five miles more, in all 25 miles a day. During two months out of every three, each police constable is on night duty, for nine hours each night, from 9 o'clock in the evening till 6 in the morning.

* See Extract on pp. 501–7.

We have been favoured by the *Commissioners of Police for the Metropolis* with the following return in continuation of that communicated by them to the Committee of the Statistical Society. The return of the average force for each year is an additional column. Our calculations based upon this column differ slightly from those of the Committee.

RETURN of SICKNESS and MORTALITY in the METROPOLITAN POLICE.

Years.	Admitted.	Removed and Retired.	Average Force.	Died.	Days of Sickness Suffered.	Annual Mortality per Cent.	Days of Sickness to each Man.
8 Years, 1831-38	8,868	8,494	3,395	256	272,391	·94	10·0
7 Years, 1839-45	8,057	6,431	4,157	224	222,913	·77	7·7

Ours are we believe correct. It will be observed that in the last seven years the dismissals, the deaths, and the sick-time have been less—though the average force was 800 greater than in the preceding period. —(McCulloch's Account of the British Empire, Article "Vital "Statistics," Vol. II., pp. 580–1.)

Sick-time increases with Age in Geometrical Progression.—If the number of attacks at each age be the same, the duration of each attack and the sick-time will increase in the same ratio; and conversely if the duration of the cases and the sick-time augment at the same rate, the number of attacks at every age will be equal. Any two of the elements being given, the third may always be deduced from them. Again, if the mortality of the attacked increase at the same rate as the mortality of the entire population, the proportion attacked at every age will be the same. Among the London labourers the mortality between 30–40, 40–50 was 1·48 and 2·43 in 100 living; the mortality among 100 attacked was 6·5 and 10·4. Now 1·48 is to 2·43 very nearly as 6·5 is to 10·4; and it results from this, that the attacks, whatever their absolute number may be, whether 22 or 52, were the same in both periods. The deaths below apply equally to the attacks and to the

Ages.	Mean Number Living.	Annual Attacks.	Annual Deaths.
30–40	100	22	1·48
40–50	100	22	2·43

living: they apply however high the absolute number of attacks be raised, provided it be raised to the same degree in both periods; but cease to apply if the number of attacks in each period be different.—(McCulloch's Account of the British Empire, Article "Vital Statistics," Vol. II., p. 594.)

Health Insurance.—Sickness is not easily defined. It varies very much in degree; but for practical purposes the line is drawn by friendly societies, police, army, navy, and by patients in civil life with sufficient accuracy. Such sickness as confines a member to bed, called *bedfast* sickness, or at home from work, a policeman from duty, a soldier or sailor to hospital, figures as sickness in the respective returns. Enthetic disease is not recognised by the friendly societies or the police; but it swells the sickness of the army and navy returns. In civil life men

work and take physic when their ailments are slight, whereas in the public service they are sent to hospital. Women oftener return themselves sick than men. The sickness of very young and very old people has not been accurately determined.

But it has been found by experience that in England to *one annual death* in a body of men *two* are on an average constantly suffering from sickness of some severity. There are *two years* of severe sickness on an average to *one death*. In the police and in some friendly societies the constantly sick to one annual death are 2·8; in the army (1873) at home 4·2; enthetic disease will account for the difference.

As there are now 700,000 annual deaths in the United Kingdom it may be inferred that there are 1,400,000 constant sufferers from severe sickness; and 2,000,000 sufferers from such sickness as requires medical relief, or throws the members of friendly societies on their funds. That would give 100 patients each to 14,000 hospitals and 6,000 dispensaries. The sickness is of every shade, from the darkest mortal ailments to the lighter pains and muscular weaknesses, and is so related to the mortality that the deaths and sickness within certain limits rise and fall together; thus, if the constantly sick in the population could be reduced from 1,400,000 to 1,050,000 the deaths could be reduced from 700,000 to 525,000; or the annual mortality would be reduced to the desired rate of 17 in 1,000. The diminution of human suffering keeps pace with the diminution of the death-rate; so do the ineffectives of the working population and the claims on the funds of friendly societies.

Sickness occurs irregularly through a man's life in attacks as they are called; still under such a law that there is an *average amount* of sick-time to every death; men are also subject to an average number of attacks during their lifetime under the same sanitary conditions; the liability of adults to attacks of one kind or other being the same at different ages, but the fatality and the duration of the illnesses from those attacks rising with the advance of age according to the same laws.*

It is evident that these societies are most useful adjuncts in sustaining health; when the head of the family is disabled, they supply him with medical attendance and a sum sufficient to meet his most urgent wants. And as there is a law of average sickness while every man's life or health is uncertain, they are indeed *Friendly Societies*, and with good management and proper tables will confer all the benefits they promise. The ordinary premiums are often inadequate to provide sick-pay—that is, really annuities—after the age of 65†; and the societies do not profess to support the members through chronic diseases of more than 12 or 18 months duration. Here the aid of the fortunate steps in to help the artizan and labourer in misfortune. Under the English Poor Law the sick man in need is provided with medical relief and sustenance; every man's life is insured against death by starvation, provided that, if able, he is willing to work.

Unhappily no community can, in our present state, undertake to supply all its members with all they want; and if we express in money the price of drink, food, heat, physic, clothing, lodging, cleansing, including sewerage required for the enjoyment of the longest mean lifetime (L) we shall have this equation, putting I for income:

$$\frac{I}{d+f+h+p+c+l+s} = xL$$

* McCulloch's Account of British Empire, Vol. II., Article "Vital Statistics," pp. 570–96.

† *See* Extract from Registrar General's 12th Report, pp. 514–17.

where x is a fraction approaching *unity* as the full cost of the commodities of life approaches the income. Galen justly remarks that there is one hygiene for those who can command all the necessaries of life, another for those whose means are limited. To decide on the comfort to be sacrificed with least lost by the poor is an important life problem for the hygienic student.

The deaths in England in the year 1871 were 514,879; implying 1,029,758 persons constantly sick from diseases of some severity; that is equal to a number sufficient to fill 10,298 hospitals, each containing 100 beds always occupied. And it may be assumed that the numbers are sustained by an annual influx of 12,357,096 patients, ill a month on an average, of whom 11,842,217 recover, 514,879 die.

46,556 persons died in the year in public institutions—in hospitals 13,706, lunatic asylums 4,097, workhouses 28,753; and 468,323 died in their own homes or elsewhere. Whether the patient in hospital or home shall recover or die often depends upon the medical attendant.

Under the new and judicious Friendly Societies Act the sickness and mortality returns will no doubt be so organised as to throw much light on the health of different occupations as well as on the finance of sickness insurance.* (Supplement to 35th Annual Report, pp. lxxvii–viii.)

Health insurance may be effected on the same convenient plan for servants and artizans as life insurance. Thus a man servant, aged 20, who pays ·650*l.* or 13*s.* at the beginning of every quarter (1*s.* a week) for 5 years would, without the payment of any further premium from the fifth year inclusive, be entitled to ·454*l.* or 9*s.* 1*d.* *a week*,—for every week of sickness, that he experienced during the next 40 years; or until the age of 65, when the payment of his deferred annuity should commence. He would be entitled to 1*s.* 10*d.* a week during sickness in the first year, 3*s.* 8*d.* in the second, 5*s.* 6*d.* in the third, 7*s.* 3*d.* in the fourth, and 9*s.* 1*d.* a week during sickness in the fifth year, at the end of which it is assumed that the payment of his premiums ceases. A young artizan of the age of 16, by continuing the payment of 1*s.* a week for 11 years, insures 1*l.* a week in sickness from the age of 27 to the age of 65; and a sum rising every year from 1*s.* 11*d.* a week to 1*l.* in the intermediate years of age 16 to 27.

For a guarantee fund some addition should be made to the net premium; the rate of pay in sickness should be less than the wages, and the usual proofs of sickness should be demanded.

Clerks, artizans, and all the labouring classes obtain salaries and wages—incomes—much earlier in life than the higher professional classes, and it is a fortunate circumstance—of which they are apparently unaware—that by setting aside every year a small sum for the 8 or 10 years after their earnings commence, they can INSURE THEIR LIVES, purchase a PENSION in OLD AGE, and insure a PROVISION in SICKNESS, before they ARE MARRIED, and *thus leave the whole of their income after marriage free to meet the increased expenses of housekeeping.*

The two following tables have been framed, and will be found: the first, applicable to the class of artizans who earn wages ranging from 25*s.* to 42*s.* a week; the second to the class of labourers on wages ranging from 8*s.* to 15*s.* a week. The premiums should be deducted every week from the wages; and if the employers contribute a sum annually, equivalent to one third, one fourth, or one fifth of the

* Friendly Societies Act, 38th & 39th Vict. c. 60., 1875.

premiums, it will form a guarantee fund, and there will in all healthy trades and places be a surplus which may be distributed among the members, either as a deposit available like money in a savings bank,—or a sum insured and payable at the death of the member to his widow, children, relatives, or friends.

WEEKLY PREMIUM to insure PAY in SICKNESS at the rate of £1 a week.

Age.	Weekly Premium from this Age to the Age following.	Age.	Weekly Premium from this Age to the Age following.
	d.		*s.* *d.*
15—	3	56—	1 0
17—	4	57—	1 1
22—	5	58—	1 2
33—	6	59—	1 3
40—	7	60—	1 4
45—	8	61—	1 5
48—	9	62—	1 6
51—	10	63—	1 7
54—	11	64—	1 8

The table may be read thus:—A person of the age of 17, or of any age under that following (22), insures, for a premium of 4*d.* a week, sick pay at the rate of 1*l.* for every week of sickness, or of 3*s.* 4*d.* for every *day of sickness*, except Sunday.

WEEKLY PREMIUM to insure PAY in SICKNESS at the rate of 7*s.* 6*d.* a week.

Age.	Weekly Premium from this Age to the Age following.	Age.	Weekly Premium from this Age to the Age following.
	d.		*d.*
15—	$1\frac{1}{3}$	58—	5
22—	2	59—	$5\frac{1}{2}$
36—	$2\frac{1}{3}$	60—	6
44—	3	61—	$6\frac{1}{2}$
49—	$3\frac{1}{3}$	62—	7
53—	4	63—	$7\frac{1}{2}$
57—	$4\frac{1}{3}$	64—	8

The table may be read thus:—*A person of the age of* 22, 23, *or of any age under* 36, insures, for a premium of 2*d.* *a week, sick pay* at the rate of 7*s.* 6*d.* for every *week* of sickness, or of 1*s.* 3*d.* for every day of sickness, except Sunday.

The table is graduated on this principle: 2*d.* a week insures 7*s.* 7*d.* a week at the age 35–36, and at the age 22–23 it insures a larger sum, as the sickness is then less; these larger variable sums, which the premiums cover may be paid if the contribution of the employer is liberal, and the persons who keep and audit the accounts are ready calculators who have time to spare. The annexed table will enable such persons to determine the sick pay that every penny a week of premium will provide, at every age from 20 to 64, among *workmen of average health.*

The NUMBER of PENCE which for every Week of SICKNESS a Premium of a PENNY a Week will provide.

Weekly Premium, a Penny.					
Age.	Weekly Sick Pay in *Pence.*	Age.	Weekly Sick Pay in *Pence.*	Age.	Weekly Sick Pay in *Pence.*
	d.		*d.*		*d.*
20	61	35	45	50	27
21	60	36	44	51	26
22	59	37	43	52	25
23	58	38	41	53	24
24	57	39	40	54	23
25	56	40	39	55	22
26	55	41	38	56	21
27	54	42	36	57	19
28	53	43	35	58	17
29	52	44	34	59	16
30	51	45	33	60	15
31	50	46	32	61	14
32	48	47	30	62	13
33	47	48	29	63	12
34	46	49	28	64	11

RESULTS in reference to HEALTH INSURANCE, deduced from Returns procured by Mr. Neison and Mr. Thomas Cleghorn, Registrar of Friendly Societies in Scotland; compared with the results deduced from the English Life Table, No. 2.

Age.	Number of Pounds, Shillings, or Pence which a Premium of 1*l.*, or 1*s.*, or 1*d.* a Week, will provide over a single Year.		
	By 67 Scotch Societies 1846–50.	By Scotch Societies before 1845 (Neison).	English Life Table, No. 2.
18	69·648	61·920	65·674
23	71·607	59·390	58·345
28	70·390	61·381	53·236
33	58·010	63·712	47·763
38	54·269	57·127	41·829
43	46·226	48·689	35·712
48	29·073	34·543	29·820
53	17·692	22·007	24·503
58	14·836	16·658	17·922
63	8·519	10·118	12·281
	Col. 1	2	3

The table may be read thus:—A man aged 23, who for the year after that age pays a premium of a penny per week, would be entitled to pay, during sickness, of 71·607 pence weekly by column 1, 59·390 pence by column 2, and 58·345 pence by column 3, deduced from the English Life Table.

It will be observed that the sum that can safely be insured is larger at the earlier ages by the Scotch returns than it is by the column deduced from the English Life Table.

In conformity with the existing practice of friendly societies, the members of the fund should contribute for *three* or for *six* months before they are admittted as free members to receive pay in sickness.

After the age of *sixty-five* the line of demarcation between health and infirmity or sickness becomes indistinct, and for the practical purposes of health insurance can be drawn with neither certainty nor uniformity. What under one set of circumstances is considered health is under another paid for as *sick-time*. The provision for the age of infirmity and non-production should therefore be of the nature of a deferred annuity; the premium commencing early, and ceasing about the age of 25 or 35; the annuity opening at 65.—(Appendix to 12th Annual Report, pp. xxxvii–xli.)

2. ELEMENTARY EDUCATION.

Education, and Signatures in the Marriage Register.—In considering in what manner the records deposited in this office may be rendered useful in illustrating the condition of the people, I have found the registers of marriages calculated to throw much light upon the state of education, with respect to writing, among the adult population of England and Wales.

Almost every marriage is duly registered, and every register of marriage is signed by the parties married; those who are able writing their names, and those who are unable, or who write very imperfectly, making their marks. Therefore, an enumeration of the instances in which the mark has been made will show the proportion among those married, who either cannot write at all, or write very imperfectly.

It may be said in recommendation of this criterion that it is free from the disadvantage of selection, including alike every class and condition, and every age, except children and very old persons. It must at the same time be remembered, that although a fair average is thus afforded, the portion of the whole population exhibited in the yearly returns of marriages is small. It appears that there are usually about 7 or 8 marriages to every 1,000 of the population. If, therefore, it be assumed that persons between the ages of 18 and 65 constitute half the population (which the enumeration of ages in 1821 shows to be very nearly the case), it will follow that of those who may be considered the marriageable portion of the community about 30 in every 1,000 (or 3 per cent.) are married yearly. The portion, therefore, whose signatures appear on the marriage registers of a single year is sufficiently small to be easily affected by accidental circumstances; and it cannot safely be asserted that the 30 in 1,000, from whose signatures we would draw an inference respecting the other 970, may not happen to consist of more than the proportionate number of uneducated persons. It must not therefore be hastily assumed upon the evidence afforded by the returns of a single year, that the inhabitants of any particular county or district are less educated than their neighbours. The experiment must be repeated often, and be attended with similar results, before this inference can be drawn with safety; and it is only when returns of the same description, given for several successive years, shall have exhibited similar facts, that it will be perfectly justifiable to arrive at any unfavourable conclusion with respect to any particular district.

It is obvious that this criterion gives no insight into the amount and nature of the education *now* afforded. It can be applicable only to the

past, and particularly to such as existed between 10 and 20 years ago. It is confined to the signatures of persons married, and is not extended to those of witnesses in the marriage registers, or of informants in the registers of births or of deaths; and for this reason, that the signatures of persons married are entirely free from the objection of being selected instances, and that it is almost impossible that the same person should have signed twice in the same year; whereas the informants are in some degree selected persons, and the signature of the same informant is liable to occur many times.

Inability to write is, without doubt, indicative of considerable deficiency in other kinds of elementary education. Opinions will differ as to the extent to which such deficiency may from thence be inferred; and this is a question the solution of which I will not now attempt.—(2nd Annual Report, pp. 7–8.)

Elementary Education and Crime.—The proportion of those who wrote their names in 1845 was rather less than in 1844: but there was a great increase of marriages in 1845, and it is probable that the increase was greater among the ignorant than among other classes of the population, which will account for the change without implying that the population at a marriageable age in 1845 were less able to write than the population at the corresponding age in previous years. The serious fact remains, that there is no evidence that any improvement in the mere elementary education of the people took place in the period when the men and women married in the seven years, 1839–45, were educated; and that the state of education was such that 4 in 10 English men and women could not write their own names. The state of education differs in different counties. And it has recently been shown, in an analysis of the criminal returns, compared with the facts published in previous Reports, that crime is most prevalent in the districts where in proportion to the whole the fewest numbers can write. "It is found, that out of 22 different combinations formed of "the various districts of England and Wales, in every instance there "is an excess of crime where there is the least education or instruction; "and, comparing the respective sections of each group of counties, it "will be seen that there is an average excess of 25 per cent. of crime "in the sections of inferior education over that of higher education; "and in some districts the excess is as much as 44 per cent."*—(8th Annual Report, pp. 32–3.)

Signatures at Marriage as an Educational Test.—It may be here useful to inquire, of what value is this test? as by some it has been misunderstood, and by others mis-stated.

Men to the number of 164,520, of whom about *five-sevenths* were of the age 20–30, and the same number of women, of whom *five-sevenths* were also of the same age, and the rest younger or older, went through the various marriage ceremonies in the established churches, in the chapels of Protestant dissenters, in the Roman Catholic chapels, in the meeting houses of various kinds, and in the register offices in 1853. At the end of the ceremony the husband and wife are invited in all cases to sign the register book, in the presence of the officiating minister or the registrar; they having the option, if they cannot write, to sign by making a *mark* against their names.

The parties are not asked whether in their own opinion they can or cannot write, but are asked to *write their names* on an important occasion, when on many accounts it is desirable that they should append

* Statistics of Crime in England and Wales 1834–44, by F. G. P. Neison; Journal of Statistical Society, Vol. xi., Part II., p. 140.

their names, in their own handwriting, to a public register. The abstracts which have appeared in my Reports show how many men and how many women under these circumstances *do sign with marks.*

Two questions are raised on these signatures: Is the man or the woman who signs with a mark unable to write? Are the men or the women who write their names, able to write anything else? Some men and women who can write imperfectly, do undoubtedly sign with marks. Upon the other hand, some persons can write their names who cannot write a letter or keep an account in writing. The former class is perhaps the most numerous. Some of the 30 men, some of the 41 women, who sign with marks *can* write their names. Some of the 70 men and the 56 women who write their names, write little else; and are evidently unpractised writers, as their signatures are often almost illegible; not the flourishes of penmanship in which some men conceal the letters of their name, nor the undecipherable scrawl in which others write, but the uncouth, ill-formed, letters of men and women who have never advanced at school beyond the first rudiments.

Looking at both sides of the question, the obvious inference is, I believe, correct; and we have practically 49,983 young men, and 72,204 young women unable to write, out of 164,520 of each sex who married, and will be the fathers and mothers of the next generation of English men and English women.

Of these persons unable to write, it is known that large numbers are unable to read.

On the hypothesis that the numbers who can write in the ordinary sense of the word are understated or are overstated, the test is still available for purposes of comparison; as the timidity which prevents some men and women from writing their names, or the vanity which prompts others to try who can scarcely put letters together, must be almost equally powerful in the several counties of England. These disturbing causes leave the important fact unexplained, that in *ten* counties from 15 to 28 men, and in ten other counties from 39 to 50 men, in 100, sign with marks when they are required to write their names.

The value of this test is also questioned upon the ground that it is, in itself, no proof of education; and it must be at once admitted that at the utmost it shows only how many out of a given number can or cannot write. Many of the men and women who cannot now write, as in the days of old when barons and knights signed with marks, possess great intelligence and have acquired many useful arts; so thousands, on the other hand, who read and write, are ill educated, and know nothing of those liberal arts and sciences which enlarge, refresh, and invigorate the mind as the sunshine and showers fertilize and adorn the soil of England.

In fine, the arguments that the marriage registers supply in favour of the extension of education cannot be set aside by a few stories about young girls, terrified in the presence of the clergyman, making marks when they are able to write their names. The marks of the men alone are conclusive. (16th Annual Report, pp. iv–viii.)

Intermarriage of Persons who can write, with those who sign by mark.—Each marriage constitutes a family; and to the family the fact that one of its members can read and write, is of more importance than the fact that both can read and write. Now as 107,267 men and 89,441 women wrote their names in 1855, it is evident that the 196,708 may have been so distributed in pairs, as to leave no pairs in which neither the husband nor the wife could write.

Such a combination, however, does not take place. But if it is assumed that the men and women who can write, and that the men and women who cannot write, have no tendency to intermarry greater than that which disposes them to marry those who are not in the same class as themselves, it follows from a well-known mathematical formula* in the calculus of probabilities that the 152,113 married couples would have been distributed as they are in the second column of the annexed table.

—	Numbers if no selection had existed.	Numbers as given in the registers.	Difference.
Husband AND wife *write* -	63,072	76,734	+ 13,662
Husband OR *wife writes* (mixed marriages) - -	70,564	43,240	− 27,324
Husband AND wife do not write	18,477	32,139	+ 13,662
(1)	(2)	(3)	(4)

Here the indisposition to mixed marriages is evinced in the fact that instead of 70,564, there were only 43,240 couples in which *one* or other of the two could write; half the difference of those numbers or 13,662 being added to the 63,072 couples in which both husband and wife write, and the other 13,662 to the 18,477, in which neither the husband nor the wife writes. As the poor intermarry, and the wealthy intermarry, so naturally the classes who cannot write intermarry; and thus, instead of having the greatest number possible of cases in which at least *one* writes, there is not the due mathematical proportion of such cases, but in 32,139 of the new families, neither the father nor the mother will be able to write.

The number of married couples in England was about 3,150,470 in the year 1855. It is certain that at the date of their marriages, elementary education was less diffused even than it is in the present day, consequently the *proportion* of the cases in which neither the man nor the woman writes will be greater among these 3,150,470, than it was among the couples married in 1855, or even in 1847; but upon applying the proportions deduced from the facts of 1847, it is found that in 1855 there must have been nearly 1,488,000 families in which the husband and wife could both write their names; 905,912 families in which one could write the other could *not* write; and 756,558 families in which neither the husband nor wife, the father nor mother, could write their names. How defective the rest of their elementary education must have been is self-evident. (18th Annual Report, pp. v–viii.)

Elementary Education in England and in Scotland, 1862-4.—It should be recollected that the marriageable women of a country are a selected class, and include very few of the infirm, deformed, idiotic, or

* Let m denote the number of men who are able to write their names, and m' the number of men unable to write their names; also let f denote the number of women able, and f' the number not able to write; then putting $\left\{\begin{matrix} m+m'=\mathrm{M} \\ f+f'=\mathrm{F} \end{matrix}\right\}$ and multiplying the terms of the two equations into each other, we have $mf + m'f + mf' + m'f' = \mathrm{MF}$

$$\therefore \frac{mf}{\mathrm{MF}} + \frac{(m'f+mf')}{\mathrm{MF}} + \frac{m'f'}{\mathrm{MF}} = 1$$

The first term gives the proportion of combinations in which both write, the second in which the man or the woman writes, the third the proportion in which neither writes.

others incapable of learning. They can nearly all learn to write if they have the opportunity. And upon turning to the Report of Dr. Stark, addressed to the Registrar General of Scotland,* I find that all the women of the county of Kinross who married wrote their names in the registers; the proportions per cent. were also 98 in Peebles, 98 in Kincardine, 96 in Roxburgh, 96 in Kircudbright, 94 in Perth, 92 in Fife, 91 in Edinburgh, and 93 in the far off Orkneys. Under these circumstances he must be an extreme optimist who can contend that the state of education of the women of England is the best possible, when it is found that by the same test in 100 of the marrying women of the county of Bedford only 55 write their names, in Cornwall only 60, in Stafford only 52, in Lancashire 53, in the West Riding only 57, in Durham only 62, in Monmouthshire only 48, in North Wales only 51, and in South Wales only 44.

The women of London come as immigrants in large proportions from every county; 83 in 100 of the brides wrote their names. Middlesex, Surrey, Sussex, Hants, Rutland, deserve to be mentioned as counties in which 80 or more of 100 brides wrote their names in the register. In Westmorland 79 women wrote their names; but it is in the education of the men that the Northern Counties approach and even excel, several of the Scotch counties.

In Scotland we discover a state of things highly creditable to the people of that part of the United Kingdom; and it is difficult to explain the difference in any other way than that in the general struggle for the church property at the Reformation the people had the good sense to endow the schoolmasters with small stipends, and not to give the whole revenue of the land either to the clergy or to the nobility. Between the minister and the lord stood the schoolmaster in the presence of the people. The advantages of the Scotch system of education became so apparent that it was expanded in the period of the civil wars (1646), anh firmly established after the Revolution by the celebrated statute of William and Mary in 1696. The endowment was small, and stimulated instead of slackening the exertions of the schoolmaster, who had to depend largely on his own industry, zeal, and popularity for support. M'Culloch estimated the average fixed stipend at 25*l.* 10*s.*, exclusive of house and garden; the school fees at 22*l.* 10*s.*; the income from all sources at about 63*l.*†

It is impossible to say how much Scotland owes to this system of schools, and to the universities, which are accessible to the youth of the kingdom. There was probably as much revenue proportionally devoted to education in England as in Scotland, but the money was in various ways misappropriated, so that before the Reform Bill passed, and even in 1837, when the registration of marriages commenced, the working classes, entirely ousted from the educational charities and universities, were in the most deplorable state of ignorance. *One* in *three* of the young men, and *one* in *two* of the young women, of England could not write their names in the marriage register even in 1841, after some efforts had been made in the cause of popular education.

Happily a considerable improvement is visible in the registers; *one* in *four* of the men, and *one* in *three* of the women, now sign with marks. In twenty-three years the marks-men have fallen from 33 to 23; the marks-women from 49 to 32 in 100.

Still in common education the great body of the people of England are many degrees below the people of Scotland, and it is impossible to

* Eighth Detailed Annual Report of the Registrar-General of Scotland—Abstracts of 1862, p. xxiii.

† Statistics of British Empire, vol. II., p. 373.

calculate the advantage this superiority gives the Scotchman over the Englishman at home and abroad. The superior education of the people of Scotland is a benefit to the world; without it Watt could not have invented, Burns could not have written. The brightest boy in a village without a school has no chance of distinction, except by accident. (27th Annual Report, pp. xvii–xix.)

Progress of Elementary Education.—The legislature has now (by the Education Act of 1870) decreed that every child in the country shall be brought under educational influences, and the effect of this wise provision should ultimately be seen in the decline of the proportion of marks in the marriage registers, until all the marriageable people of the pre-educational period have given place to generations of men and women capable not merely of writing their names, but instructed in other essential branches of knowledge, the possession of which can hardly fail to raise the national standard of mortality as well as of intelligence.

As the year 1871 will form a new point of departure in educational matters, it may be useful to show here the extent of the improvement which has taken place as regard the substitution of signatures for marks in the marriage registers since 1841.

PROPORTION per Cent. of MEN and WOMEN who SIGNED the MARRIAGE REGISTER with MARKS, 1841–80.

PERIODS of Five Years.	To every 100 Marriages the annual proportion who signed the Marriage Register with Marks.		Quinquennial Decrease per cent. of signatures by Marks.	
	Men.	Women.	Men.	Women.
1841–45	32·6	48·9	—	—
1846–50	31·4	46·2	3·7	5·5
1851–55	30·2	43·5	3·8	5·8
1856–60	27·1	38·1	10·3	12·4
1861–65	23·6	32·9	12·9	13·6
1866–70	20·5	28·3	13·1	14·0
1871–75*	18·5	25·2	9·8	11·0
1876–80*	14·8	20·0	20·0	20·6

* The figures for years since 1871 have been added to the Table to bring the information down to a more recent date.—ED.

And the best proof that the marriage returns do yield approximately reliable evidence of educational deficiencies is the fact that year after year the same localities preserve a uniform character whether of high or low proportions of signatures. If the question of signature or mark were one of timidity, or of mere caprice with the men and women who marry, it is inconceivable that whole counties should maintain for years the same position relatively to one another as they are found to do. (34th Annual Report, p. xiii.)

3.—CIVIL REGISTRATION OF MARRIAGES, BIRTHS, AND DEATHS.

Defective Registration of Births, and of Deaths, 1837–75.—The Act of 1836† lays it down in clause 19, that the parent of a child, or the occupier of the house in which a child was born, "MAY *within forty days*

† 6 & 7 Will. 4. c. 86, clauses 19, 20.

"*give notice of the birth to the Registrar;*" and in clause 20 enacts, that the parent or occupier shall give the required information, *on being requested so to do by the Registrar.* It was not enacted that the persons who best know shall give the information; and there is no punishment for the neglect; no penalty for refusal. Any one who has administrative experience will see the difficulty of working such an enactment. How can a Registrar, who is paid a shilling a case for every birth registered, ascertain the occurrence of every birth, legitimate or illegitimate, in every house, in every street of London? In other large towns, or in wide districts, the Registrars encounter similar, or equal difficulties. The Registrars have been urged, through the Inspectors, to adopt the most effective means for getting information from all sources, and it is gratifying to me to state that through their exertions, with the assistance of the enlightened part of the public, the number of births that escape registration has constantly declined. The precise extent of the deficiency cannot be determined; but there is reason to believe that the annual deficiency in the last ten years does not exceed the estimate in the last Census Report,* and that was 13,614 out of 763,623. The probable annual deficiency in the ten years 1841–50 was 38,036, in the next ten years 19,323, and in the last ten years, as has been already shown, 13,614. The deficiency thus rapidly declined: calculated on 1,000 births occurring, it was in the three decades, 65 in the first, 29 in the second, and 18 in the third. There is little hope of effecting the registration of all the births until the Legislature enacts the carrying out of the intentions of the Act under the pressure of a penalty clause, which in practice would rarely or ever after the first year have to be enforced. If every parent of a child were directed to give early information of its birth to the Registrar, and subjected to a penalty for neglecting this duty to the child and to the State, few births would escape registration. The record would be complete; the missing links in pedigrees would be reduced to a minimum; children would be under the protection of the law, and they would no longer be under the many disadvantages arising from inability to prove their age and parentage, by a birth certificate.

There is reason to believe that a certain number of children born alive are buried as still-born, and that of deaths buried without a Registrar's certificate a few are never registered. The officiating clergyman is bound in every such case to give notice of the burial to the Registrar of the sub-district in which the death occurred; but this is not, for various causes, invariably done.

The causes of death are certified on forms supplied, in the great majority of cases, by the medical attendants of the deceased or by the coroners; but in 1871 in about 8 per cent. of the deaths the cause was not certified by a qualified practitioner. A certain small number of medical practitioners refuse to fill up the certificates for various reasons; in about 2 per cent. of the cases there was no medical attendant; and in the residue of the cases the sick children and adults were attended by chemists and druggists, by herbalists, by bone-setters, by quacks, and by various orders of unqualified people. In a considerable number of sub-districts every death is certified; in a few sub-districts, especially of Wales and Cornwall, the certificates fall to a very low proportion.

The grant of the certificate, which is now voluntarily given by the great majority of practitioners, should be rendered compulsory to meet the exceptional cases, and some means should be adopted to secure the best returns of the cause of death procurable in every case. While

* Vol. 4., Appendix A., p. 55.

asking power to meet exceptional cases thanks are due to the College of Physicans and to the medical profession generally for their friendly co-operation in carrying out the Act. (35th Annual Report, pp. v, vi.)

Results of Civil Registration, and Improvements in Civil Registration Law effected by the Act of 1874.—Births, deaths, and marriages have been partially registered in the parishes of England since the days of Queen Elizabeth; and the names of the great mass of the people of all classes, ranks, and ages who have lived since that date have been inscribed in one or other of these national records. But many of the Church register books have perished. And through the development of religious dissent and other causes they every year grew more defective until the Legislature passed the Act which came into operation in 1837: and not only relieved many consciences, but provided a better machinery for the record, not indeeed of important religious rites, but of the facts of birth, death, and marriage, with such particulars as might be of use not only in connexion with the history of families and with property, but with the social life and health of the nation. One notable column was added to the register, which has turned out to be of great importance. Inquests into violent and sudden deaths have been held for centuries in England; but now the opinions —the verdicts—of the medical men of England on the causes of all their patients' deaths are certified; and undoubtedly these recorded opinions have been already of great use, and will be of still further use to science in future times. The Legislature of England has thus taken the lead in advancing the health of Europe.

The following passage occurs in the last work of Dr. E. A. Parkes, F.R.S., the author of the best work on Hygiene that has appeared in any country: "The attention now paid to public health is in a large "degree owing to the careful collection of the statistics of births "and deaths, and of the causes of death, which have been collected in "England for the last thirty-eight years. It may truly be said indeed, "that not only all Europe, but gradually the entire world, has been "influenced by the work of the Registrar-General of England. We "are now able to determine the limits of mortality and its causes with "some precision, and are being led up to the consideration of the "causes which bring about a too high death-rate." *Public Health, by the late E. A. Parkes, M.D., F.R.S., p.* 61.

The following pages contain some account of the improvements which have, after thirty-seven years experience, been made by the new Act in the system of registration. Emigration and immigration affect the population of England more perhaps than that of any other State in Europe; and the subject has been discussed at some length, particularly noticing the influx of returning emigrants which was first noticed in the last Census report, and accounts for a certain proportion of the 24,093,767 of people in England at the end of 1875, during which year the population increased by 297,695. The English emigrants were much less numerous than in the previous six years. The seasons made their influence felt; the winter was excessively severe, and the rainfalls of the summer flooded the lands, and raised the rainfall of the year above the average. The prices of bread were low, of meat high. Indeed, in the last 20 years the price of beef rose 50, of mutton 29 per cent. How much the cattle diseases and quarantine, interrupting the freedom of trade, have contributed to this result I do not discuss; but the scarcity or abundance of food affects the registers sensibly, and so does the state of trade, which was still depressed throughout the year; yet fewer out-door paupers were relieved than in previous years. Marriage is a

civil contract, and is always registered in England; as we may trust will also be soon as effectually done in the other divisions of the United Kingdom. Three in four marriages are celebrated according to the rites of the Established Church; and the fashion of marrying by banns rather than by license has sensibly increased during recent years. The most important change is in the greater frequency of early marriages since civil registration was established; and this is discussed at some length. The spinsters married were on an average 24 years of age; and instead of 13 in 100, as in 1841–5, no less than 22 were under age (of 21). The effect of this important fact requires investigation. One of the most gratifying circumstances is the diminution of the numbers both of men and women who sign the marriage registers with marks, thereby professing inability to write their own names. The proportion signing with marks in 1841 was 33 men, 49 women, out of 100; in the year 1875 the proportions fell to 17 and 23. Thus in 30 years the proportion of ignorant husbands fell from 33 to 17; of ignorant wives from 49 to 23. The ranks of writers increased every year; those of women more rapidly than those of men; so that if the same rate of increase be maintained in the next as in the last 34 years, nearly all the men and women who marry will be educated at least to this extent—they will be able to write their names. It is gratifying to find that the disparity between men and women is diminishing; and that in 22 years at the same rate of approximation as has prevailed for ten years the numbers of husbands and wives who write will be nearly equal. The buildings registered for public worship and for the celebration of marriages still increase. While the births went on at the average rate it is satisfactory to find that the proportion of children born out of wedlock decisively decreased. In the 10 years preceding *six* children were born out of, to *a hundred* born in—wedlock; in the year 1875 only *five* were born out of, to 100 born in—wedlock. For 30 years the proportion of children born out of wedlock has progressively declined; it fell 30 per cent. Eleven years ago, out of a much smaller number of children born, 47,448 were bastards; in the year 1875 the number fell to 40,813; thus 6,635 children have now fathers and mothers who instead of repudiating recognize their duties to their offspring. It is premature to attempt to assign the cause of the change; but data are supplied which will assist the investigation. At the rate of illegitimacy that prevailed 30 years ago *seven*, at the present rate *five*, in every 100 of the people we meet would be illegitimate, if the mortality of this unfortunate class did not exceed the average; but that, as is well known, is far from being the case. Of 1,000 infants born in 1875 no less than 158 died in the first year of life; while in certain selected districts, of 1,000 infants born out of wedlock nearly double that number died in the same time. In some country districts the difference in the mortality is much greater; in Stratford-on-Avon out of 1,000 of each class born 69 legitimate, 293 illegitimate children perish; in Kendal the proportions of the two classes are 91 and 329. The assigned causes is given of infant deaths in Driffield and Preston where the mortality of the children born out of wedlock is among the highest. The deaths in excess are not due to violence, but to the want, so well shown by Dr. Russell of Glasgow of the mother's milk and care. The general result is that as the unfortunate children are cut down prematurely by thousands, the proportion surviving in the population bears no sort of relation to the numbers born. The multiplication of the breed of men and women who abandon their children is checked by an inexorable law.

The mortality year by year in the urban districts is shown in juxtaposition with the mortality of the rural districts, which will enable

the inquirer to trace the relative fatality of disease in the two classes of population; thus, for 29 years the deaths in the town districts were to the deaths in the country districts as 25 to 20; but while in the first four years 1847–50 the deaths in the towns were to those in the country as 27 to 21, they were in the last five (1871–5) as 24 to 19. Then it is shown that the excess of the aggregate mortality in 1875 was due to the excess of the mortality of both males and females at the ages above 35; the excess due to the cold weather increased rapidly as age advanced after that term.

The death registers serve the purpose of self-registering inspection. Sometimes great sums are expended on works without any apparent results; time has not ripened their fruits; or they are left imperfect; pure water is supplied without sewers, or main drainage is created without branches to connect the great trunks with every dwelling; the dwellings remain sordid and crowded; sanitary regulation is neglected. All this is revealed by the death-rate. Death cannot be deceived by sham defences. In the last and in this present Report is shown the mortality of several districts, with a summary view of the sanitary work achieved by sanitary organization.

The registers at the end of 1875 contained 54,078,314 names; 25,241,938 of children born, 12,298,886 of men and women married, and 16,537,490 of persons deceased at all ages. The birth registers are not quite complete, as a certain number of births were never registered; but on account of the excess of births over deaths in an increasing population and emigration they exceeded the deaths, which again exceed the number of persons of both sexes married. The certified copies are at Somerset House; the original registers are in the several registration districts in the custody of the registrars and superintendent registrars who are empowered to grant certificates on the same terms as the central office. In addition to the large number of searches and certificates so granted, 25,407 *searches* were made in the year 1875 at Somerset House and 19,639 certificates were granted, for which 3,879*l.* 15*s.* 6*d.* were duly handed over to Her Majesty's Exchequer.

The births, deaths, and marriages for the United Kingdom are given; and the several rates which differ somewhat from the rates of England, chiefly in consequence of the defects of the marriage registers of Ireland and Scotland, where the registration of marriage is not enforced as it is in England. Dr. Burke, the Registrar-General of Ireland, has shown that the births in Ireland are depressed by the emigration of women at the child-bearing age, so that the low birth-rate of 26·1 per 1,000 in Ireland to 35·5 in England, and to 35·4 in Scotland, is not entirely due to defaults of the Irish registration officers. Dr. Burke points out how by more judicious arrangements the registration of deaths might be rendered more complete in Ireland; and, no doubt, under his energetic administration the registration of marriages and births will ere long be as complete in Ireland as it is in England. The defect of the records of the most important events in the lives of the people is remedied in France, Belgium, and Italy by recording every marriage as a civil act without interfering at all with the solemnities of religious ceremonial. In the meantime the English rates may be accepted as representing pretty accurately the corrected returns for the United Kingdom; with which the returns procured from the most advanced States of Europe may be compared.

The members of the International Statistical Congress have undertaken to draw up under different categories a series of reports based on official returns from the different States. The first on the population of Europe has been issued by Dr. Berg, the delegate for Sweden, and is worthy of that eminent statist and of his country, which enjoys the renown of having taken the first Census in modern times—1751. Dr. Berg returns the population up to 1870 or 1872; and a careful estimate has been framed of the area and population of the several States in 1875 and 1876 by Herr Behm and Dr. Wagner. By this estimate the population of Italy expressed in millions is 27½, England (U.K.) 33½, France (1872) 36. Austro-Hungary 37¾, Germany 42¾, Russia in Europe 73½ millions. The population of the great States with their colonies and dependencies is, by the latest estimates: British empire 236 millions, Russian empire 87 millions, Turkish empire 48 millions, German empire 43 millions, France 42 millions, Austro-Hungary 38 millions, Italy 27 millions. The area of the British empire is 20 million square kilometers, of the Russian empire 22 million square kilometers.

Since 1st of January 1875, the Act which amends the previous statutes regulating registration of births and deaths has been in force; it *compels*, under a penalty, parents to record births, and nearest relatives to record deaths, in the civil register books.

This amending Act was considered necessary with a view to making more complete than formerly the record of births, and in the hope of obtaining increased accuracy with respect to each particular registered concerning deaths.

Formerly many births annually escaped being recorded in the civil registers, more particularly illegitimate births in large towns. It may be hoped that this *compulsory* clause may reduce the number omitted, although the birth register is not as yet quite complete.

With respect to deaths, very few escaped civil representation, and the chief defect was the want of accuracy in the information supplied for record by persons "present at death," and "in attendance" during fatal illness.

Many mistakes were consequently made as to the exact number of Christian names, the precise spelling of surnames, the age, the occupation of the deceased, and the cause of death; occasioning necessarily much trouble to the Bank of England, insurance offices, friendly societies, clubs, &c., and to everybody who had occasion to use certificates of death.

Now it has become the duty of the "nearest relatives," in addition to burying the deceased, to record in the civil register, within five days after death, the various particulars rendered necessary by statute; and thus it is to be hoped that the original entries will be correct, requiring no or few corrections—a change which I shall be glad to see, as alterations in registers are not to be encouraged.

This *compulsory* system, under penalties, imposes new duties on the public, and accordingly the Statute makes it imperative that the registrar shall be at home at certain fixed hours on particular days in each successive week, and thus be accessible to informants, who, on repairing to his office at these times, which are announced and published, will be certain not to have made a useless journey, and will be enabled at once to make the entry.

Moreover, registrars have, in order to meet the convenience of the public, to attend at "stations" on fixed days in distant parts of their sub-districts, where the inhabitants may avail themselves of the opportunity of meeting the registrar in their own immediate neighbourhood.

Prompt registration, quickly effected after the occurrence of a birth or death, is gratuitous; unless a householder prefers requiring the

registrar to attend at his residence rather than go himself to the office; in such a case he can make that arrangement on paying the small fee of one shilling.

When a death occurs, the nearest relative is permitted to send "notice" of the event, accompanied with a medical certificate as to the fatal disease, to the registrar, and if the death is recorded within 14 days no penalty is incurred.

Formerly births could not be registered when more than six months had elapsed; now, under special authority, they may be recorded even within seven years.

An arrangement has been made for registering births when parents, having omitted to perform that duty, having gone into a distant part of the country; which is very convenient for the migratory portion of the community.

No name of a putative father can now be registered without his consent, and unless he himself sign the entry in conjunction with the mother.

Greater facilities are afforded for recording any name which, having been given after registration to an infant in baptism or otherwise, it is desirable to add to or to substitute for the named recorded in the first instance.

Coroners are required to transmit to registrars verdicts of juries, to be recorded in registers of deaths, more promptly than formerly.

An infant cannot legally be buried as still-born without the production of a certificate or declaration; which may be considered a very great improvement on the former loose system. I trust that the clergy and the cemetery authorities will strictly carry out this salutary law.

Registered medical practitioners are now required, under a penalty, to certify the causes of their patients' deaths, which are registered together with the names of the certifying practitioners. The number of uncertified deaths has already been greatly diminished under the new statute, and the inquiries which the registrars now make when no medical certificate is produced cannot but tend to strengthen the protection to human life which registration supplies.

Greater facilities are given for changing boundaries of districts.

Deputies must be nominated by all registration officers.

Offences against the Registration Acts may now be summarily brought under the notice of magistrates in petty sessions, whereas formerly in most cases of prosecution it was necessary to proceed by the expensive process of indictment at assizes; consequently many escaped unpunished. When the offence is held to be serious, the delinquent may still be prosecuted by indictment.

Returns are to be made at a very cheap rate to sanitary authorities and school boards; and so are certificates to friendly societies, as well as to factory inspectors; and this, although convenient for the public, is not perhaps unnaturally felt to be a grievance by registration officers.

Persons registering births may now, on paying the small sum of 3*d.*, receive a statement recording name and date of birth, which, although not evidence in a court of law, may be useful in after days.

Parliament has sanctioned the payment to each registrar of 4*l.* 10*s.* annually, in addition to his former small emoluments, in acknowledgment of the trouble he takes, and has during many years gratuitously and cheerfully taken, in sending extra periodical returns to be made use of in the Weekly, Quarterly, and Annual Reports issued from this office.

An alteration has been made in the mode of correcting errors of fact and substance incurred in the registers; and the method is a great improvement upon the former system, which was much too lax.

Births and deaths at sea are recorded here more completely than before, and certified copies of the same are obtained by the public without difficulty.

Such are some of the new enactments, and it may be confidently expected that they will be found to be conducive to the public benefit.

Steps have been taken to make the provisions of the new Act generally known, and it is satisfactory to state that it has not been found necessary to take proceedings to enforce the compulsory clauses, except in a few instances, where a breach of the law had been aggravated by the conduct of the offender.—(38th Annual Report, pp. v–x.)

Registration Sub-Districts of England and Wales, 1872.—The registration of births and of deaths is performed either at the houses of the people or at the offices of the 2,195 registrars. As each informant has to go to the office of the registrar of his sub-district, or the registrar has to go to the house in which the event occurred, it is evident that the size of the sub-district is one important element in the administration of the Act. A second element is the population; for the births and deaths bear a certain though variable relation to the existing numbers. A third element is also important, and that is the mode in which the population is distributed over the area, as the population may be dispersed pretty evenly in farms and cottages over a wide area of country, or a dense ward of a city; again, it may be, and is often, concentrated chiefly in a town, but with wide suburbs, and with open country parishes associated with the town for registration purposes. The original church registration of baptisms and burials, as well as marriages, was parochial; it was performed at the church; so the informants had to go to the registering clergyman, but had not to travel further than the limits of the parish which, however, might be great or small. That system of registration was, as is well known, incomplete as regards both births and deaths.

The sub-district was substituted for the parish as the registration administrative area; and containing a variable but an average number of 7 parishes, it increased the distances to be travelled; with this alleviation to the public, but aggravation to the labour of the registrar, that the registration of birth or death might be performed in the house where the event occurred.

There were countervailing advantages: where the registrars were paid by a fee for each event registered, an extensive population might supply them with sufficient employment, and such an income as would command the services of educated men.

The division of the country into sub-districts in the first instance was made by the Poor Law Commissioners and Guardians, apparently without any very definite rule as to size or population; but the general result is, that there are seven parishes on an average to each; that the average area of a sub-district is 26½ square miles, the average population in 1871 *ten thousand three hundred and forty-seven:* while the average number of persons married in a sub-district in that year was 173, of births 363, of deaths 235. Then the weekly number in an average sub-district was 7 births, and 4 or 5 deaths; making about 11 births or deaths weekly. If the registrars visit every house to register births and deaths, they cannot on *an average* travel more than *two* miles in each case, nor probably much less than one mile unless they arrange to register the births periodically in beats. Their pay is at the

rate of a shilling an entry, and 1*s.* 6*d.* additional for the first 20 births or deaths.

While the average area and population are as given above, the extremes are very wide from the average. The sub-district of Berwick-street, St. James's, London, comprises only 24 acres (0·0375 mile), while Bellingham in Northumberland, round the tributaries of the North Tyne comprises 175,131 acres (274 square miles).

It appears that 11 sub-districts have less than 1000 inhabitants; and 11 have populations ranging from 71,319 to 123,915.

Thus it will be noted that 475 of the sub-districts had an area of 20 and under 30 square miles, equivalent in area to circles with radii ranging from 2·82 to 3·34 miles; that 2 of them had a population under 1000; 244 a population under 5000; 166 a population of 5–10,000, 54 a population of 10–20,000; and 11 a population of 20–30,000.

When a country has once been sub-divided for any administrative purpose in which officers are appointed to distinct portions of territory, any change is attended with some inconvenience, and some disturbance of vested interests. But there can be no doubt that with the experience that has been acquired, a better working division of the country could be made now; so as to retain or secure the services of able registrars, and at the same time to offer the public greater facilities. Thus the sub-districts of 80 square miles of territory, equal to a superficies of 8 by 10 miles are too large; and this is still more the case with sub-districts of 90, 100, and so on up to 274 square miles.

Upon the other hand as regards area, the sub-districts of less than a square mile are below the mark; though many of these very small sub-districts are populous, and five have a population exceeding 50,000.

The large sub-districts of Croydon with 71,319 inhabitants, of Preston* with 85,427 inhabitants, including something more than the towns, are conveniently served by one registrar; and the same may be said of the other 9 most populous sub-districts, one of which (Everton* in West Derby district, near Liverpool) contained in 1871 *one hundred and twenty-three thousand nine hundred and fifteen* inhabitants.

The advantages in towns attainable in ample sub-districts are various; good officers, with due care in the selection, can be obtained, as the remuneration is sufficient to pay for the whole of their time, and a place for the registry office can be found in some well known central public building. In the continental cities it is in the Town Hall. As a general rule the largest sub-districts are among those in which the registration is by far the most efficiently performed. (35th Annual Report, pp. xxiv–vii.)

Delay in the Publication of the Registrar General's Annual Reports.—Before closing this Report, it may be permitted to advert to a circumstance which has sometimes been made the subject of observation, namely, the interval of time, which to some persons may appear to be longer than is necessary, between the close of the year to which the subjoined tables relate and the date at which they are ready for publication. In the present instance their preparation, and work which must be done antecedently to that preparation, have occupied a period of fifteen months. It has been asked: Why this delay? The question may be put by some whose haste to gain knowledge is not immoderate, but who have not become acquainted practically with the immense labour involved in the construction of statistical tables, and in the calculations based on them. It is put by others whose great desire will

* The sub-districts of Preston and Everton have since been sub-divided—ED.

not be satisfied till the statistics of the British empire for this current year 1862 are laid with the morning journal on their breakfast tables on New Year's day 1863, and who even then, because they live in an age of mechanical invention, for which by some process of thought they take credit to themselves, will not consider it their duty to be surprised at so remarkable a result. In answer to the question it may be stated:—

1. That this office was established by Act of Parliament, primarily, for the purpose of collecting, arranging, paging, examining, correcting, binding, and indexing the certified copies of the English registers, and of supplying stamped certificates of births, deaths, and marriages to all persons who may apply for them; that the certified copies are received quarterly, but the returns are not completed till nearly three months after the end of each quarter; and that the preparatory duties which have been mentioned, and which occupy a majority of the clerks engaged in the office during a period of eight months after the quarterly arrivals have begun, must be performed in respect to each volume before it can pass into the hands of the statistical clerks. As the work in the Record Department advances, each quarterly volume is released for the preparation of the statistical abstracts; but the entire number of volumes of any registration year are not available for this purpose till the September following the termination of the year.

2. That in conformity with a provision of the Registration Act, a general abstract is prepared, in each year, of the number of births, deaths, and marriages registered during the foregoing year, in order that it may be laid before Parliament; but the detailed abstracts that constitute the "Annual Reports" are works of much labour and skill, and necessarily occupy considerable time in preparation. These reports are not designed merely to answer a temporary purpose. They may be regarded as storehouses of facts which have been arranged on methods that are approved as the most useful and convenient, and to which, both now and in future years, students of vital statistics may resort for the elucidation of questions bearing on the social condition of the people, on national progress, on life, health, and disease. It is important that they should be *done well.* It is desirable only in the next degree that they should be *done quickly.*

It will be urged that the machinery of registration should be employed to give immediate warning of epidemic diseases, to trace in contemporaneous reports their beginning, progress, and decline, and to assist in investigating general and local conditions in which they are developed. When the plague is at the door, the people will not wait till its history can be written in a blue book. This is quite true, and it will be sufficient to state in reference thereto, that a weekly report for London and other large English towns is published on the Tuesday following the termination of each week, and a quarterly report for England and Wales within a month after the close of each quarter. (23rd Annual Report, pp. xliii–iv.)

4. COST, AND THE PRESENT AND FUTURE ECONOMIC VALUE OF MAN.

The characteristic of life property in wages, and in incomes from professions, commerce, trades, and manufactures, is that it is inherent in man, and is the value of his services—of the direct produce of his skill and industry. In slaves it is vendible and transferable; in freemen it is inalienable; but is not the less on that account property, which in the early states of society is assessed and taxed in the form of personal

services. It is combined with stock in all productions; and the proportion of the elements varies in every kind of product.

The labour of the parents, and the expense of attendance, nurture, clothing, lodging, education, apprenticeship, practice, are investments of capital, at risk extending over many years; and the return appears in the form of the wages, salaries or incomes, of the survivors, commencing at various ages, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, and ages still greater; for the incomes in the higher professions increase probably up to the age of 50 or 55. The outgo increases from infancy up to a certain age; the earnings then commence, and ere long equal the outgo; they are subsequently in excess throughout manhood, and at advanced age decrease, until they are extinguished amidst the feebleness and infirmities of old age. The present value of the person's probable future earnings, *minus* the necessary outgo in realizing those earnings, is the present value of that person's services. Like capital invested in the soil, in the vintage, or in a commercial adventure, the capital invested in the life of man returns, in happy natures, profit of a hundred-fold; in other cases fifty, twenty, tenfold; in others it is barely returned; in some it is entirely lost, either by death, sickness, vice, idleness, or misfortune.

A large part of the profit of trade, and even of professions, is derived from external capital. I leave this for the moment out of consideration. And then, in large classes of cases, as well as in individuals, the incomes differ; but they will be found, on an average, to bear a very constant relation to the amount of capital invested in preparation—to the risk under which it is exposed—and to the time that it is under investment. The latter element is of greater importance than is generally imagined; for the fact that the earnings commence at ages ranging from 15 to 45, will account for much of the difference in the incomes of different classes. This may be illustrated by cases of deferred annuities. Thus, if interest is reckoned at 5 per cent., 100*l.* a year from birth to the age of 15 is worth 148*l.* a-year from that age to the end of life; 100*l.* a-year from birth to the age of 25 is worth 362*l.* a-year from that age to the end of life; 100*l.* a-year from birth to the age of 30 is worth 540*l.* a year from that age to the end of life; 100*l.* a-year from birth to the age of 40 is worth 1,180*l.* a-year from 40 to the end of life. Thus, capital yielding the same profit in different professions may, during the age of return, yield average incomes respectively of 100*l.*, 200*l.*, 300*l.*, 400*l.*, 500*l.*, ... 1,000*l.*

The following table has been calculated by the formula $\frac{N_{0|x}}{N_x}$ = the deferred annuity which a premium of 1*l.* a-year from birth to the age x will provide from that age to the oldest age in the Life Table.

The DEFERRED ANNUITY which a PREMIUM of 100*l.* a-year will purchase if continued up to the AGES of 15, 25, 30, and 40 years respectively, allowing either 3 or 5 per cent. per annum interest.

(Results deduced from the new English Life Table.)

Age.	3 per Cent.	5 per Cent.
	£	£
15	91·42	148·36
25	202·75	362·10
30	287·12	539·72
40	563·36	1180·05

Thus the premium of 100*l.* a year, allowing the rate of interest to be 5 per cent. per annum, provides deferred annuities of 148·36*l.*; 362·10*l.*, 539·72*l.*, and 1,180·05*l.*, according as the premium is continued from birth to 15, 25, 30, or 40 years.

From the English Life Table we find the number of persons who live from birth through every year of age to the end of a century. Let the average wages, salary, or professional income, earned in the year of age x to $x+1$ be represented by w_x; then as P_x represents the numbers in the life table living through that year; $w_x P_x$ will be the sum of the wages; in like manner $w_{x+1} P_{x+1}$ will be the sum of the wages in the year of age $x+1$ to $x+2$; and so on to the end of the table, age ω. Let this column be added up from the oldest age to the age x, and the sum be represented by W_x; then W_0 against the age 0 = the sum of the wages of the generation. As the sum of the column P_x in the life table is Q_0 (= the total numbers living at all ages, to a given number of births, D_0), it is evident that $\frac{W_0}{Q_0}$ = the average annual earnings per head of the whole generation; and $\frac{W_0}{D_0}$ = the average earnings of each person from birth to the end of his life.

So if the average cost of maintenance of a child age 0–1 were known to be y_0; and of a person through any year of age x to $x+1$ were y_x; then the cost of maintaining P_x persons would be $y_x P_x$; and the sum of a column of such numbers from the end of the table to the age x would be Y_x; the cost of the maintenance of the generation would be Y_0. The difference between the wages and the cost of maintenance is $W_0 - Y_0$; or the surplus of the earnings over the cost of necessary subsistence. $W_0 - Y_0$ may be called the profit; as W_0 represents the produce, and Y_0 the cost of production. Then $\frac{W_0 - Y_0}{Q_0}$ = the *annual* profit per head; and $\frac{W_0 - Y_0}{D_0}$ = the average aggregate gain on the life of each individual.

If we assume for a moment that the profit $W_0 - Y_0$ is in the possession of an individual A; and is a transferable value; the price will depend upon the rate of interest (i) at which investments of the kind are made. Thus, if the rate of interest is 5 per cent. per annum, the annual revenue $W_0 - Y_0$ will be worth 20 years' purchase. For in this case $\frac{W_0 - Y_0}{i} = \frac{W_0 - Y_0}{\cdot 05} = 20\,(W_0 - Y_0)$. The produce or income will be at the rate of $\frac{100\,W_0}{20\,(W_0 - Y_0)} = \frac{5\,W_0}{W_0 - Y_0}$ per cent. on the capital; the expenditure or outgo $\frac{5\,Y_0}{W_0 - Y_0}$ per cent.; the profit $\frac{5\,W_0 - 5\,Y_0}{W_0 - Y_0} = \frac{5\,(W_0 - Y_0)}{(W_0 - Y_0)} = 5$ per cent. on the capital invested.

If instead of the series P_x in the life table, the series $(1+\frac{i}{2})\,v^{x+1} P_x$ be employed; the present values at birth, and at any age x (1) of the future wages, (2) of the future cost of maintenance, are immediately obtained: the difference is the value of the future profit. And on dividing by the column $D_x = v^x l_x$, the present value of the average wages, cost, and profit of a man of the age x is found.

The value of w_x and y_x can only be learnt by observation. And the actual wages of classes of men in different trades and professions, as well as the actual cost of education and maintenance, are *desiderata* in statistics.

The tables from which an extract is given at the end of this paper, have been framed from returns of the wages of agricultural labourers, with which I was some time ago favoured by Sir James Kay Shuttleworth, and from returns collected by witnesses before a committee of the House of Commons.

The cost of maintenance is an estimate. Instead of the series P^1_x,* the series D_x has been used throughout (Table C.), which is equivalent to assuming that the wages and cost in the several years of age were equal in value to the sums in the columns w_x and y_x, paid down to or for each person at the precise age x. The character of the results is thus indicated with sufficient exactness for illustration and for all practical purposes.

It will be seen that at the age 20, the value of an agricultural labourer's future wages is 482*l.*; that the value of the estimated cost of necessary maintenance is 248*l.*; that the net value of his services is therefore 234*l.*

TABLE A.—DIGEST of SIR J. KAY SHUTTLEWORTH'S RETURN of the WAGES of the BEST CLASS of LABOURERS in NORFOLK.

Age.	Number of Labourers.	Earnings of Man.	Earnings of Wife and Children.	Earnings of Family, including Gleaning.
		£	£	£
17–20	4	77	—	77
20–25	14	374	7	381
25–30	27	813	39	852
30–35	37	1,160	137	1,297
35–40	37	1,140	175	1,315
40–45	37	1,164	237	1,401
45–50	29	924	274	1,198
50–55	19	581	134	715
55–60	13	407	90	497
60–65	4	126	31	157
65–70	3	77	7	84
70–75	2	36	4	40
75–80	1	16	—	—
80–85	—	—	—	—
85 and upwards	—	—	—	—
Total	227	6,895	1,135	8,014

* The above series, P^1_x, is not in the life table, and has only been calculated at 3 per cent. interest for Table D. *See* p. 536.

TABLE B.—WAGES and COST of MAINTENANCE of AGRICULTURAL LABOURERS in ENGLAND. (Extract from a Complete Table.)

1. Age. x.	2. Living at each Age. l_x.	3. Sum of the Living at each Age and upwards. N_x.	4. Expense of Maintenance per Annum for one Person. y_x.	5. Wages Earned per Annum by one Person. w_x.	6. Expense of Maintenance for all the Living the year following the Age x. $y_x l_x$.	7. Wages Earned by all the Living in the year following the Age x $w_x l_x$.	8. Expense of Maintenance for the whole of the Living at each age x and upwards. Y_x.	9. Wages of all Living at the Age x and upwards. W_x.	10. Net Profit = the Difference between the Income and Outgo. $(W_x - Y_x)$.
			£	£	£	£	£	£	£
0	513	20,961	7	--	3,591	—	268,539	420,488	151,949
5	372	18,848	7	--	2,604	—	253,741	420,488	166,747
10	355	17,029	8	--	2,840	—	241,008	420,488	179,480
15	346	15,272	12	12	4,152	4,152	224,501	415,249	190,748
20	335	13,561	15	23	5,025	7,705	201,945	386,913	184,968
25	321	11,914	15	29	4,815	9,309	177,240	344,124	166,884
30	307	10,337	15	31	4,605	9,517	153,585	297,143	133,558
35	291	8,834	15	31	4,365	9,021	131,025	250,519	119,494
40	275	7,410	15	31	4,125	8,525	109,665	206,375	96,710
45	257	6,071	15	31	3,855	7,967	89,580	164,866	75,286
50	237	4,826	15	31	3,555	7,347	70,905	126,271	55,366
55	215	3,685	15	31	3,225	6,665	53,790	90,900	37,110
60	189	2,660	15	31	2,835	5,859	38,430	59,156	20,726
65	156	1,780	15	29	2,340	4,524	25,215	32,008	6,787
70	118	1,074	15	21	1,770	2,478	14,625	13,807	— 818
75	79	560	15	16	1,185	1,264	6,915	4,359	— 2,556
80	44	239	15	4	660	176	2,100	378	— 722

The Table B. should be read thus: of 513 males born annually, 335 attain the age of 20; and the sum of the numbers who attain that and every subsequent birthday is 13,561: the expense of bare maintenance in the year following is 15*l.* (rather less than 6*s.* a week); the wages of one labourer in the same year are 23*l.*; the cost of maintaining the 335 is 5,025*l.*; their wages amount in the same time to 7,705*l.*; the cost of maintaining all at and above that age is 201,945*l.*, while their wages are 386,913*l.*; the difference or the net annual profit is 184,968*l.*

TABLE C.—MONEY VALUE of a MAN; or VALUE of the FUTURE EARNINGS and of the COST of MAINTENANCE of an AGRICULTURAL LABOURER. (Interest 5 per Cent.)

Age.	Present Value of			Annuity Equivalent in Value to		
	Future Earnings, $\frac{W_x}{D_x}$	Cost of Future Maintenance, $\frac{Y_x}{D_x}$	Excess of Earnings over Cost of Maintenance, $\frac{W_x - Y_x}{D_x}$	Future Earnings, $\frac{W_x}{N_x}$	Cost of Future Maintenance, $\frac{Y_x}{N_x}$	Excess of Earnings over Cost of Maintenance, $\frac{W_x - Y_x}{N_x}$
	£	£	£	£	£	£
0 -	147·89	142·52	5·37	10·75	10·36	·39
5 -	260·32	204·38	55·94	14·81	11·63	3·18
10 -	347·88	231·01	116·88	19·84	13·17	6·67
15 -	438·85	247·30	191·55	25·73	14·50	11·23
20 -	482·06	248·47	233·59	29·10	15·00	14·10
25 -	487·90	241·55	246·35	30·31	15·01	15·31
30 -	474·35	233·19	241·16	30·53	15·01	15·52
35 -	451·73	223·51	228·22	30·35	15·02	15·34
40 -	423·71	211·69	212·02	30·02	15·00	15·02
45 -	391·11	198·35	192·76	29·59	15·01	14·58
50 -	350·64	182·27	168·37	28·78	14·96	13·82
55 -	301·41	163·59	137·82	27·46	14·91	12·56
60 -	238·29	141·08	97·22	24·76	14·66	10·10
65 -	165·20	119·20	46·00	19·93	14·38	5·55
70 -	97·09	96·32	·77	13·92	13·81	·11
75 -	49·11	73·66	−24·55	8·55	12·82	−4·27
80 -	10·25	51·27	−41·01	2·20	11·00	−8·80

TABLE D.—VALUE of the FUTURE WAGES of AGRICULTURAL LABOURERS, and of PROFESSIONAL INCOMES. (Interest at 3 per Cent.)

Age.	Interest 3 per Cent.			Without Interest.		
	Value of Future Wages and Salaries.			Amount of Future Wages and Salaries.		
	Of Agricultural Labourers.		Of Persons in Professions on Moderate Incomes.	Of Agricultural Labourers.		Of Persons in Professions on Moderate Incomes.
	On High Wages.	On Low Wages.		On High Wages.	On Low Wages.	
	£	£	£	£	£	£
11	542	—	—	1,187	—	—
15	607	456	—	1,195	886	—
20	637	487	—	1,151	859	—
25	627	481	5,329	1,068	796	10,462
30	597	459	5,700	965	718	10,240
35	556	424	5,951	856	629	9,844
40	509	373	6,038	746	530	9,250
45	456	312	5,932	636	427	8,451
50	397	253	5,584	527	335	7,424
55	330	201	4,933	416	256	6,140
60	255	157	3,979	306	191	4,641
65	172	116	2,718	198	135	2,961
70	100	72	600	112	80	609
75	49	32	—	52	34	—
80	8	5	—	8	5	—

NOTE.—The amount of the future income is the average amount received after the Ages in the first column.

The table should be read thus.—The value of the future earnings of (1) an agricultural labourer on good wages at the age of 25 is 627*l.*, (2) of an agricultural labourer on low wages 481*l.*, (3) of persons in a profession returning a moderate income of about 288*l.* a year is 5,329*l.*; the average amount of wages after that age is 1,068*l.*, and 796*l.*, and 10,462*l.* respectively.

Here $Q^1_x = (1 + \frac{i}{2})\,(v^{x+1} P_x + v^{x+2} P_{x+1} \ldots + v^{\omega+1} P_\omega)$. And P_x the average number of persons living through the age x to $x + 1$ by the life table.

W_x is obtained from the series Q^1_x by multiplying the several terms by w_x, w_{x+1} ....

Then $\frac{W_x}{D_x}$ = the present value of the wages.

The values in this table are given on the extreme hypothesis that the wages are as certain to be paid as Government Life Annuities at 3 per cent. interest. Compare these values with those in Table C., where the interest is 5 per cent.—(Paper on the Equitable Taxation of Property in Journal of the Statistical Society, Vol. XVI., pp. 38–44.)

5. RISK OF FATAL RAILWAY ACCIDENTS, AND INSURANCE AGAINST DEATH OR INJURY THROUGH RAILWAY ACCIDENTS.

The persons killed on railways in 1868 amounted to 797, 714 being males and 83 females; 34 of the persons (21 males and 13 females) were returned as killed by manslaughter. Of the deaths, 24 (21 of males and 3 of females) were suicides: the unhappy victims threw themselves on the railways, and converted the trains into steam Juggernauts.

This return differs largely from that made to the Board of Trade for the same year, showing only 150 deaths in England and Wales.* The companies speak with confidence of the accuracy of their returns of passengers, 39 of whom they state were killed by causes beyond the passengers' own control, and 14 by causes referable to misconduct or want of caution. In the two previous years, 24 and 28 passengers were killed. The return of accidents to servants of companies and of contractors is said to be incomplete, because many railway companies are not required by law to report accidents to such persons to the Board of Trade. It is in this respect that the return to the Board of Trade is most defective. It is probable that none of the railways return deaths occurring some weeks after the injury. The numbers "injured" by the English railways in 1867, as stated in the returns, was 660 to 138 deaths; in 1868, it was 528 to 150 deaths, or excluding the Abergele accident, to 117 deaths.

Registration records only 13 deaths by collision in 1868. In the five years 1863–7 only 82 persons were said to have been killed by collision, 31 by trains running off the line. That makes 23 deaths annually including engineers and stokers. It is probable, therefore, that the return by the companies of 105 passengers killed in three years (1866–8), or 35 annually, though under-stated, may serve as a basis of computation; and the number, as compared with the number of journeys, is not considerable. Thus in the year 1867, besides 84,418 season ticket

* Number of accidents of injury to life and limb which have been reported to the Board of Trade during the year 1868. Parliamentary Paper 162, July 1, 1869. The deaths for Scotland were 47, for Ireland 15.

holders, 250,598,982 passengers travelled by rail; and as 35 were killed on an average of the three years 1866–7–8 according to the returns, the chance of this disaster on the way to any one is represented by the fraction ·000,000,12, after correcting for season ticket holders. Hence it follows that a premium of 1-eighth of a farthing, will insure 1,000*l.* on an average journey, and taking 600 journeys a year ·072*l.* = 1*s.* 5*d.* will insure 1,000*l.* on any life killed during a year of average journeys. Then, as about 23 passengers are injured to one killed, by taking the duration of illness into account, we see how those ingenious persons who undertake insurance against railway accidents make their calculations and profits.*

The chances against being killed in any single journey vary with the line, and perhaps with the distance; but if the return is correct, the general chance is more than 8,000,000 to *one* that a passenger will arrive at the end of the journey alive; and the chances are more than 362,000 to *one* against his being either injured or killed. It is probable that there is now no safer kind of locomotion than railway travelling. It is safer than riding on horseback, or in a carriage.

This degree of safety is only maintained by the laudable vigilance of the companies, and of their officers: and the vigilance is kept up by the heavy pecuniary fines to which they are liable for every injury or death inflicted on a passenger by their default.

Seeing the small number of accidents to passengers, it has been too readily assumed that there is no danger to passengers in railway travelling; and this saying has been quoted: "a person who wishes to "put himself in the safest place possible cannot do better than enter a "first-class railway carriage."

This is based on a fallacy. The rate of mortality from *all causes* is always given, like the rate of interest, so as to show the rate per cent., or per 1,000 *per annum;* and at the age of 30 this is 10 per 1,000, at 50 it is 20 per 1,000 *per annum*. The railway mortality has been calculated hitherto on the journey, which is on an average of 9·6 miles and may be of half-an-hour's duration, more or less. The rate which has been given above is, therefore, *per half hour;* and as there are 17,520 half-hours in the common year, the rate *per annum* is 17,520 times the rate per half-hour. When the multiplication is performed it will be seen that the rate of mortality on a constant average railway-travelling population is 2 per 1,000. This is an appreciable addition to the ordinary mortality of men, which ranges from 10 at the age of *thirty*, to 20 at the age of *fifty*, and to 40 at the age of *sixty-three*.

Dangers can be numerically appreciated with great exactness on a large scale, but in practice it is not customary to take into account additions or diminutions of the rate of mortality not exceeding one-10,000th part: and men every day encounter dangers of that measured magnitude without hesitation. Unless they had this sufficient amount of courage human affairs could not go on; the lion in the path would bring everything to a standstill. But when the annual rate is raised under any exceptional conditions such as railway travelling by *one*, and certainly when it is raised by *two* in 1,000, the increase under those conditions cannot be entirely

* The railway companies return 68 killed to 1,557 injured by their default; the numbers injured by the passengers' own defaults is evidently wrong. It is only 16 injured to 37 killed in the three years 1866–7–8. I take the proportion from those reported killed and injured by the companies.

neglected. The railway carriage cannot be held up as a harbour of perfect safety.

But taking the railway passengers' rate of mortality at 20 in 10,000 for the whole year round it is evident that a season ticket-holder who is on an average railway only an *hour* a day for 300 days adds less than one-10,000th to his risk: it is, therefore, below the degree of commonly appreciated danger. For double the time the risk may be doubled; but even this is only an addition of 2 to the ordinary risk of 150 in 10,000 from all other causes incurred by a life at the age of *fifty*. Insurance offices constantly neglect such slight additional risks in dealing with men living in different circumstances, in different professions. As the assayer of gold cannot test its fineness from alloy with any certainty beyond the 2 or 3 ten thousandth part, so it is in scientific assays of the value of human life.

It is gratifying to find that the risk to the railway passenger has continually decreased since the early observations of the year 1840–3, when the passenger encountered a risk five times as great as our computation gives; and this improvement may be in part fairly ascribed to the laws under which railway companies are liable to heavy claims from injured passengers for damages. The least want of vigilance, inefficient training of the staff, overwork, defaults in the construction of the line, defects in the engines or the carriages, lead to most disastrous consequences.* Against the divers elements of danger we have the natural anxiety of the directors, and of a very skilful body of officers to ensure the safety of the lives of their passengers. All their efforts in this direction are sharpened by the heavy penalties of the law. And it is easily conceivable that any relaxation of existing safeguards might lead to an immediate increase of danger to passengers, so that the deaths, injuries, and fears of travellers may become twice as great as they are now.

The "servants of companies or contractors" do not appear practically to enjoy the same legal protection as passengers, and they are killed in considerable numbers: in the year 1868 the companies returned 53, and "many companies" do not take the trouble to report such deaths to the Board of Trade, "not being required to do so by law." This is very evident, for in 1868 while 150 deaths on the railways in England and Wales are returned from all causes, to the Board of Trade, the total of such deaths distinguished in the registration returns are, after deducting 24 suicides, no less than 773! After the deduction of 53 passengers, and of 34 trespassers or persons killed at level crossings, 686 remain, who must have been chiefly "servants of the companies "and contractors." No fines, we may presume, were inflicted in these cases, as the relatives would have no means of bringing actions under Lord Campbell's or any other Act. The workmen have no remedy when they are killed "by causes beyond their own control;" and their deaths in most instances are from causes under their control.

It must on these grounds and on others be admitted that the people at large, and the railway companies, have reason to be dissatisfied with the present state of the law. In the year 1867, when the railway companies returned the deaths of 28 passengers, 15 were killed by causes beyond the control of the said passengers; and 13 by "their

* See Neison's Contributions to Vital Statistics, p. 247. His paper is an excellent digest of results deducible from the Board of Trade Returns down to the year 1852. In 1840–3 *sixty-one* passengers were killed in 57,617,578 "passages," or *one* in 944,550. 260 passengers were injured. But the average distances travelled then were 18 miles for which allowance has to be made, as the distances are now less than 10 miles.

"own misconduct or want of caution," if we adopt the judgment of the companies in the matter. The persons injured in the two categories, they state, were 578 and 6, the latter evidently wrong; for that year the companies paid 322,985*l.* as "compensation for personal injury, &c."* This is a large sum; it is 2·4 per cent. on the 13,534,281*l.* of fare-receipts from passengers. It does not include all the legal expenses of the party injured; and we have no means of knowing the amounts or the per-centage on the sums awarded by juries.

The companies have just grounds to complain of the costs of litigation, which are probably included in the above sum, and of the uncertainty of awards, which are based on appreciations of the extent of injuries often obscure,† and of the value of men's life incomes, scarcely within the capacity of juries, or of the ordinary courts. The public have still greater ground for dissatisfaction. The families of poor men can derive little advantage from the law; and the result to the opulent is uncertain. Some railways deal with sufferers in a liberal spirit; others are said to oppose every claim by hostile litigation: here is another ground of inequality under the laws.

In endeavouring to arrive at remedies, four things have to be especially kept in view; (1) the principle that to ensure the utmost care on the part of the railway authorities loss of life or limb is to be compensated, so far as this can be equitably done, by payments in money bearing some reference to the economic value of the person injured; that (2) the railway should know beforehand the amount it may be called upon to pay; that (3) both the railway company and the person injured should be relieved from any unnecessary expense in obtaining an equitable settlement; and that (4) the tribunal for determining the extent of injury, the value of the life, and the division of blame, should be skilful and competent.

I have shown elsewhere that the economic value of men can be estimated by deducting the present value of their necessary subsistence from the present value of their future earnings. Thus, taking his wages as the basis, the value of a Norfolk agricultural labourer, at the age of 25, was found to be 246*l.*‡; while the value of the income of a professional man earning 300*l.* a year being 5,000*l.*, the deduction of his necessary professional subsistence may reduce the money value of his life to something like 3,000*l.* By neglecting this element, the values of a life are sometimes exaggerated. The compensation for injury can never exceed the value of the life; and the injuries to body and limb may be classified by a tariff, so as to bear definite proportions to the value of the whole life. The tariff would be subject to modification in singular cases which can be easily conceived; thus the loss of a finger may deprive a great violinist of his fortune.

Objections may be raised to this principle of compensation. The lives of the Queen's subjects are all equal in the eyes of the law. And no one admits that a railway company can be justified in neglecting any precaution in the case of a single passenger, be he rich or poor. The same vigilance and care are required and given in all cases. Why then should the company pay more for the life of an officer than for the life of a soldier, for the life of a judge than for the life of a solicitor, for

* Parliamentary Return, No. 484, 1868; what the "&c." means in the return is not clear.

† The difficulty of the surgical questions will be at once seen on referring to the Classic essay on "Railway and Street Injuries of the Nervous System, by J. E. Erichsen, Professor of Surgery in University College."

‡ Journal of Statistical Society, March 1853, pp. 39–44. The value of the wages is 488*l.*; of the necessary subsistence 242*l.* (*See* Extracts on pp. 531–7.)

the life of a bishop than for the life of a curate. Yet the loss or injury on a carriage full of curates might not exceed 30,000*l.*, while the loss on the life of two bishops might raise claims for a larger sum. The answer to this is that the compensation in money is to the individual, or to his family, for the pecuniary loss, to which it must therefore bear some defined proportion. Besides, as all classes are mixed up in a train, the effect of the larger fines on the railway companies is to awaken a vigilance calculated to prevent injury—and that is after all the main object—to the lives of all classes be they of small, or be they of exorbitant value. It is possible, however, and even desirable to save disputes, expenses and uncertainty, to try and find some average minimum amount, suitable to the majority of cases, and susceptible of expansion to meet exceptional instances. This can be done on the principle of insurance.

(1.) Thus to deal with the *Cases of Death for which the railway company is exclusively liable.* Let a fixed sum be paid by the company for each passenger killed by its default, and let the sum, varying for the three classes of passengers, be fixed after careful inquiry. I assume for the moment that the sums have been determined; and that they are 1,361*l.* for first class, 1,000*l.* for second class, and 600*l.* for third class passengers.* Then the tariff of injury would be graduated on these scales: assume for the moment that on the 23 annual deaths from the companies fault the amount is 23,000*l.*; and that the rate for injuries is so graduated as to amount to an average of 300*l.*; then 519 injuries a year will cost 155,700*l.*; making with compensation for deaths 178,700*l.* That is less by 144,285 than was paid by the English companies in 1867 as compensation for personal injury "&c." in the latest year for which we have returns. It leaves a reserve.

Where Parliament limits the fares to meet a special purpose it may limit the compensation.

(2.) The passengers killed by what the return designates their own "misconduct or want of caution" appear at first sight to have no claim; but in each of these cases a small fine should be levied, in order to enforce attention to provisions of prevention on the part of the company. Here is an illustrative case:—A solicitor (J.), enjoying an income of 2,000*l.* a year is killed under these circumstances: he is startled from sleep, and attempts to leave the carriage as the train starts; he is stopped by a servant of the company, who is an old soldier, and acts in strict conformity with the regulations; in the struggle, J., falling between the platform and the iron wheels of the carriage, is crushed to death. He is found stretched on the ground, with torn clothes, and a physician has to communicate the sad intelligence to his wife, now a widow, who was awaiting his return to dinner. He was killed, as the return would say, "by his own misconduct." But it was held by the jury, that if instead of a narrow step for the foot, the interval between the platform and the carriage had been protected, as it is in some other cases, J. could not have been crushed, his family could not have been deprived of 2,000*l.* a year, Another solicitor was killed shortly after, not under the same, but under similar circumstances. The structural alteration suggested by the jury involved some expense; it was not carried out. It may possibly be inexpedient on other grounds, but it is quite certain that if in all such cases the company were subject to a fine on the old principle of the deodand, no means would be neglected to prevent passengers being killed by such "misconduct" of their own, or by any want of precaution on the part of the company.

* These sums are in proportion to the average fares of the three classes:—2·11*d.*; 1·55*d.*; and ·93*d.*

(3). The guards, engine-drivers, stokers, and other servants of the company, who are killed by causes beyond their own control, are justly entitled to compensation, at a settled rate. The workmen of the company or of contractors, often strong but dull, require drilling, training, and instructing against the dangers of the line. The contractors and companies could by discipline prevent many deaths, and would exert themselves more diligently in this direction if they had in every case of death or injury on the line to pay a definite fine. Some of the companies liberally contribute to the friendly societies of their servants, which should be made the universal rule. The whole of the members of such a fund, as well as the company, should be called upon to contribute at every death on the line, to give every one an interest in saving life.

(4). There is no provision to meet those extreme cases from which the companies suffer, inasmuch as the claims upon them appear practically unlimited. How much has been demanded cannot be stated, but 13,000*l.* it is said were paid in one case; 7,000*l.*, 5,000*l.*, 4,000*l.*, 3,000*l.*, 2,000*l.*, and 1,000*l.* are apparently common claims. These cases give rise to expensive litigation, and the scientific estimate of the value of a life income, on which the amount hinges, is thrown into the hands, and left to the decision, of an ordinary jury. What the result may be is a matter of chance. A trial, for a family left destitute, is a hazardous speculation. These cases will be met by the companies insuring the lives up to 5,000*l.* The passenger will thus appraise his own life, and will pay a premium partly recovering the risk, sufficient, with some addition from the company's reserve, to pay the sums insured wherever the passenger is killed on the line, whether by accident to the train or otherwise. Thus in three years (1866–8) 35 passengers were killed annually: 12 by their own want of caution or misconduct, 23 otherwise. This is from the company's return. The proposal is to pay the *insurance* on the 12 deaths, as well as on the 23 deaths. These sums are insured by special premiums paid by the passengers; and will therefore be independent of the compensations covered by the tariff under the first head.

I may here answer a preliminary objection: "There are *Railway* "*Passengers Insurance Companies* in existence, and any other insurance "is unnecessary." The answer is: these companies have no control whatever over the causes of death and injury, and the principle here upheld is that the losses on lives should be met by the parties who can exercise a certain control over the events against which insurance is effected. Besides, these insurance companies limit their insurances to 1,000*l.*; and if the returns of the companies are complete, the insurance is curtailed of its fair proportion by a proviso, somewhat misleading, that the insurance shall extend "to such injury only as shall be caused "by some injury or *accident to the train.*" They pay for nothing beyond the above 23 deaths; so for a third of the deaths returned they pay nothing; and the death of J. above cited under such a policy would not have been by *accident to the train;* and had he held a policy his family would have got nothing from a Railway Passengers Insurance Company. Their general policy even apparently does not cover all the deaths by accident on a railway, while it extends to other accidents.

An action by law is now maintainable against a person who by his *wrongful act, neglect,* or *default* may have *caused the death* of any person.* This action, under the Act, can now be brought "notwith-

* Preamble to 9 & 10 Vict. cap. 93. Lord Campbell's Act is entitled, "An Act "for compensating the Familes of Persons killed by Accidents." (26 Aug. 1846.)

"standing the death of the person injured." Every such action shall be for the benefit of the wife, husband, father, mother, grandfather, grandmother, step-father, step-mother, son, daughter, grandson, granddaughter, step-son, and step-daughter of the person killed. The jury may give such damages as they think *proportioned to the injury resulting from such death to the parties respectively* for whose benefit the action is brought.

By the Judicial Statistics, we learn that 203 actions were brought under the Act in the year 1868; 122 of the verdicts were for the plaintiff, 3 were subject to special case or reference; 29 verdicts were for defendant, in 6 jury was discharged without verdict, in 5 a juror was withdrawn, 38 were cases of nonsuit, or were otherwise disposed of. The total amount recovered was 68,092*l.*; which if equally divided among the successful plaintiffs, taken at 124, gives an average of about 549*l.*; in 9 of the cases the damages were 1,000*l.* to 2,000*l.*; 6 were 2,000*l.* to 3,000*l.*; 1 was 3,000*l.* to 5,000*l.*; and in 1 the damages were 9,750*l.** Actions were brought in 98 other cases of injury from negligence; of which 47 resulted in verdicts for plaintiff, 4 were subject to special case, and 9 to reference; 7,202*l.* were recovered, we may assume by 60 plaintiffs, or on an average 120*l.* each. The largest damages in a single case are said to have been between 2,000*l.* and 3,000*l.*†

The expenses of the 301 trials are not stated, but they would necessarily be large; and the dread of expense necessarily deters many executors from moving. To meet this difficulty to some extent, the Act was, in 1864, amended by 27 & 28 Vict. cap. 95, which gave other persons beneficially interested power to bring actions.

Many of these actions were brought against railway companies; but the whole amount of 75,294*l.* recovered goes but a short way towards the compensation for personal injury as shown in the returns to the Board of Trade. There is a wide margin for law expenses, and the greater part of the residue must go to meet unlitigated claims.

(4). Any common tariff to compensate for deaths or injuries can only provide for the cases of persons of moderate fortunes; and should only be pitched to meet a part of the pecuniary damage sustained, as the fine is not vindictive but preventive, and in mitigation of a family's losses. Railway life insurance by the companies ensures the continuance of vigilance on their part, substitutes definite for unlimited claims, and gives families the fullest benefit free from the uncertainty and expenses of litigation.

The insurance could be most conveniently effected by annual policy tickets, to be issued by each company, but in such terms as to insure, for a commensurate premium, any sum from 500*l.* up to 5,000*l.*, payable by the *company owning any railway in the United Kingdom on which the passenger insured was killed;* and in case of injury a sum proportional to the extent of loss, always a fractional part of the sum insured, sustained by the passenger.

The risk of death on a single journey being so slight we have no coin small enough to pay a premium for 1,000*l.*; but taking 600 average journeys, nearly 6,000 miles for the year's travel, of an average person

* This was an action of "Howard *v.* The Great Indian Peninsular Railway Company, tried at Lewes, Sussex, on 17th July 1868, before Mr. Justice Willes. The jury found a verdict for the plaintiffs for 9,750*l.*, which they distributed thus:— to the widow 3,750*l.*, and to each of three children 2,000*l.*"

† Judicial Statistics, 1868. Part II., pp. 3–11.

likely to insure, the exact premium calculated on the companies' own returns to the Board of Trade is 1*s.* 5*d.* (·072) for 1,000*l.* on each death Take the injuries by the same returns at 15 to each death $\left(\frac{524}{35}\right)$; and let the damages for an injury be on an average 1-third of the sum insured at death; they would necessarily have a large range as the injury was slight or severe; then the premium to insure against injury would be 7*s.* 3*d.*, making 8*s.* 8*d.* in the aggregate. To settle the premium minute preliminary inquiries would have to be made into all the results of experience attained, and into the circumstances affecting the loss of value of the professional life by injuries, but for the purpose of illustration let it be assumed that 8*s.* a year will henceforward insure the passenger's life to the extent of 1,000*l.* against death or injury by any railway accident, without raising the question of default on his own or the company's part; and of this let 7*s.* be paid by the insurant, 1*s.* by the company.

The insurance might be thus worked. The passenger would take out an annual policy; the premium being 7*s.* for 1,000*l.*; 35*s.* for 5,000*l.* If he take out a season ticket he will take out the insurance ticket at the same time; and in all other cases he will take his insurance ticket at the station nearest to his residence. Each railway in the United Kingdom will issue insurance tickets, and the premiums will be paid into one fund under separate accounts; and the compensations for death or injury on each railway will be written off the account of that railway which will be called upon to make up its own deficiencies. There will be many arrangements of detail necessary to insure the well-working of such a system; but it could all be brought in England under the railway clearing house system. The premium should be subject to approval by a Government office, and be so rated as to render it the interest of companies to reduce the current mortality.

I have assumed for the moment that the insurances would not be taken for more than 5,000*l.*; but as sometimes larger sums are awarded it may be deemed right to insure for larger amounts; at the above rates a man of large professional income might insure 10,000*l.* for an annual premium of 3*l.* 10*s.* The actual compensations are paid by the passengers, whose fares are fixed with due reference to the compensations as well as other charges, and the premiums for the additional sums required to meet the cases of lives of more than ordinary value would relieve the companies to a considerable extent.

Each man having appraised himself in his policy no further question of the economic value of the whole life could be raised. That would be fixed by the tariff for all uninsured cases, and by the policy of insurance in other instances. It is understood that the tariff price would be paid on every person killed by the default of any railway company, as well as the extra sum insured.

The cases of *injury* are so infinitely diversified, and so difficult to measure, that to deal with them it may be necessary to establish a special court of arbitration, consisting of a barrister, a surgeon, and an actuary, who would soon acquire experience and be able to lay down general rules for future guidance.

Under these arrangements, we might expect improved means for the prevention of deaths in travelling on railways, and fewer deaths among the servants of the companies and of the contractors. At the present time a battalion is killed every year. (31st Annual Report, pp. 203–8.)

6. Family Nomenclature in England and Wales.

In former Reports* have been described the nature and important use of the indexes prepared in this department, by means of which the entry of any registered birth, death, or marriage can be generally referred to, on the mere mention of the name, in a very short space of time. These indexes, which are separately prepared for the births, deaths, and marriages registered in each quarter, receive a yearly addition of upwards of 1,350,000 names; and at the end of the year 1854 they contained the names of 4,828,464 persons married, of 9,598,276 children born, and of 6,622,108 persons who died during the period of $17\frac{1}{2}$ years from 1st July 1837, when the system of general registration commenced. More than 21,000,000 of the names of the immediate subjects of one or more of the important events of birth, death, and marriage were thus inscribed in the indexes to the registers, which thus form a nominal list of no inconsiderable number of the people of England, living or deceased.

The personal or family nomenclature of the inhabitants of any country is a subject of considerable interest. Much that is illustrative of their early condition, customs, and employments is often discoverable in the names which have been handed down to them from bygone generations, and an investigation of the origin and character of these names will always afford matter for curious speculation and useful inquiry. English surnames have already to some extent engaged the attention of antiquaries and others, who have brought to light many interesting facts on the subject; but several curious questions as to the number and extension of particular surnames have never, owing doubtless to the want of a sufficient collection of observations, been fully examined. As a contribution in aid of such inquiries, it may prove not uninteresting to notice here a few of the more obvious facts derived from the indexes to the registers, leaving the application of them to those whose tastes may lead them to follow up the subject.

The most striking circumstance presented by the indexes is the extraordinary number and variety of the surnames of the *English* people. Derived from almost every imaginable object,—from the names of places, from trades and employments, from personal peculiarities, from the Christian name of the father, from objects in the animal and vegetable kingdoms, from things animate and inanimate,—their varied character is as remarkable as their singularity is often striking. Some of the terms which swell the list are so odd and even ridiculous that it is difficult to assign any satisfactory reason for their assumption in the first instance as family names, unless indeed, as has been conjectured, they were nicknames or *sobriquets*, which neither the first bearers nor their posterity could avoid.

In Wales, however, the surnames, if *surnames* they can be called, do not present the same variety, most of them having been formed in a simple manner from the Christian or fore-name of the father in the genitive case, *son* being understood. Thus, Evan's son became Evans, John's son Jones, &c. Others were derived from the father's name coalesced with a form of the word *ap* or *hab* (son of), by which Hugh ap Howell became Powell, Evan ap Hugh became Pugh, and in like manner were formed nearly all the Welsh surnames beginning with the letters B and P. Hereditary surnames were not in use even amongst the gentry of Wales until the time of Henry VIII., nor were they generally established until a much later period; indeed, at the present day they can

* First and Sixth Annual Reports of the Registrar General.

scarcely be said to be adopted amongst the lower classes in the wilder districts, where, as the marriage registers show, the Christian name of the father still frequently becomes the patronymic of the son in the manner just described.*

The probable number of surnames in England and Wales has been the subject of conjectural estimates based on a small collection of facts. By the careful collation of all the registration indexes it could be approximately ascertained; for during a period of more than seventeen years it is probable that almost every resident family contributed to the registers an entry of birth, death, or marriage. The task of collating upwards of two hundred immense quarterly indexes would, however, involve a vast amount of labour without any commensurate result; moreover the number of names is constantly varying, owing, on the one hand, to emigration, or to the extinction of families by death, and on the other, to the introduction of fresh names by foreigners and immigrants, to the corruption of existing names always going on amongst the illiterate, and to various other circumstances. The numbers of different surnames contained in one quarterly index of births, and in another of deaths have been ascertained; the former selected with reference to the period of the last Census, and the latter without premeditation. The following are the results;—

	Persons registered.	Different surnames.
BIRTHS. Quarter ending 31st March 1851 -	157,286	25,028
DEATHS. Quarter ending 31st March 1853 -	118,119	20,991

According to these numbers, there were for every 100 of the births registered about 16 different surnames, and for every 100 of the deaths about 18, reckoning every surname with a distinctive spelling, however slightly it may differ from others, as a separate surname. Taking the two indexes together, and by a careful collation eliminating all duplicates, the numbers stand thus:—

Persons registered.	Different surnames.	Different surnames to every 100 persons.	Persons to *one surname*.
275,405	32,818	11·9	8·4

An alphabetical list of 32,818 surnames, the largest collection yet made, is thus obtained; and as this result is furnished by two quarterly indexes only, it may be assumed as a rough estimate that the whole number in England and Wales is between *thirty-five* and *forty thousand*. It is important, however, to remember that the list includes a large number derived from the same roots as others, commonly agreeing in sound, but differing in orthography often only to the extent of a single added or substituted letter. By these trifling variations the number is immensely increased. The name of Clerk, for instance, is also commonly spelt Clark and Clarke, one and the same primary name (from *clericus*) being implied in the three forms; but three separate items necessarily appear in the list, for practically as *surnames* they represent different and distinct persons and families. Again, the widely spread name of Smith appears in family nomenclature also as Smyth, Smythe, and even as Smijth. It is not usual, however, to regard these diverse forms as

* So late as the time of the accession of the House of Hanover, the unabbreviated prefix "ap" was very commonly used, and, by employing it with the contracted form, three generations could be expressed in one name; thus *Richard ap Pritchard* implied Richard the son of Pritchard the son of Richard.

representing one name only, nor would all their bearers probably concur in admitting the common origin of the several variations. Until a comparatively recent period, an entire disregard of uniformity and precision in the mode of spelling family names prevailed, even amongst the educated classes, and many family Bibles and writings might be adduced as evidence that this was apparently less the result of carelessness than of affectation or design. While the *sound* was in a great measure preserved, the number of different surnames became greatly multiplied by these slight orthographical variations, as well as by other corruptions; and if, in reckoning the number, each original patronymic with its modifications were counted as one, the list of 32,818 would be considerably reduced.

The contribution of Wales to the number of surnames, as may be inferred from what has been already stated, is very small in proportion to its population. Perhaps nine tenths of our countrymen in the Principality could be mustered under less than 100 different surnames*; and while in England there is no redundancy of surnames, there is obviously a paucity of distinctive appellatives in Wales, where the frequency of such names as Jones, Williams, Davies, Evans, and others, almost defeats the primary object of a name, which is to distinguish an individual from the mass. It is only by adding his occupation, place of abode, or some other special designation, that a particular person can be identified when spoken of, and confusion avoided in the ordinary affairs of life. The name of John Jones is a perpetual incognito in Wales, and being proclaimed at the cross of a market town would indicate no one in particular.

From the circumstance of their common British origin it might be supposed that the Welsh people and the inhabitants of Cornwall would exhibit some analogous principles in the construction of their surnames; such, however, is not the case. The Cornish surnames are mostly local, derived from words of *British* root, and they are often strikingly peculiar. A large number have the prefix *Tre*, a town; the words *Pol*, a pool; *Pen*, a head, *Ros*, a heath, and *Lan*, a church, are also of frequent occurrence in surnames. The Cornish family nomenclature differs materially from that of the rest of England.

The local distribution of surnames is not the least interesting branch of this subject; for most persons will have remarked that every district of the country possesses some surnames rarely met with anywhere else, the origin of which must be sought for in circumstances peculiar to the locality. To trace out the connexion between the surnames and these circumstances is a task which may be most advantageously undertaken by local inquirers; and the indexes prepared by each superintendent registrar, and preserved with the registers in his custody, would prove useful adjuncts in such investigations.

While it is obvious that the original adoption of a particular surname was the result in most cases of arbitrary circumstances,—since John Smith, instead of being called after his occupation, might equally have chanced to become John Johnson from his father's Christian name, or John Wood from the situation of his abode, or John Brown from his complexion,—it is curious to remark the predominance of certain names, which seem to have been adopted preferentially by large numbers

* Of the 328 registration officers and their deputies acting in the districts of Wales, 207 are comprised under 17 surnames, in the following proportions; viz., Jones 46, Williams 26, Davies 16, Evans 16, Thomas 15, Roberts 14, Lewis 11, Hughes 10, Edwards 8, Lloyd 8, James 6, Griffith 6, Morgan 6, Rees 6, Owen 5, Morris 4, and Ellis 4. There is only one officer of the name of Smith. The districts referred to are numbered 581 to 623 in the Abstracts, and include some portions of English Counties on the Welsh border.

of the people, or conferred upon them by others, and now prevail in every county of England. Do these common names hold the same rank in point of numbers which they had at first, or have some of them spread and multiplied more rapidly than others? For instance, is the present predominance of the Smiths amongst English surnames due to the original numerical strength of that great family, or to some special circumstances acting upon the ordinary laws of increase, owing to which the descendants of the hammer-men have multiplied at a greater rate than the bearers of any other name? Has the progency of the tawny Browns increased faster than that of the fair complexioned Whites, relatively to the original numbers of each race, so as to account for the excess of the former over the latter; or were the Browns in a majority in the first instance? Various are the surmises and speculations to which such questions may give rise. One point, however, the registration indexes enable us to determine; the particular names which have ultimately attained the strongest hold on the people; and also, with tolerable certainty, the relative numbers of the adherents of each.

The subjoined list of 50 of the most common surnames in England and Wales is derived from 9 quarterly indexes of births, 8 of deaths,

FIFTY of the most common SURNAMES in ENGLAND and WALES, with the aggregate Number of each entered in the Indexes of Births, Deaths, and Marriages in the Year ending 30th June 1838, of Births in the Quarter ending 31st March 1851, and of Births, Deaths, and Marriages in the Year 1853.

—	Surnames.	Number of Entries of each Surname.	—	Surnames.	Number of Entries of each Surname.
1	Smith	33,557	26	Harris	7,042
2	Jones	33,341	27	Clark	6,920
3	Williams	21,936	28	Cooper	6,742
4	Taylor	16,775	29	Harrison	6,399
5	Davies	14,983	30	Davis	6,205
6	Brown	14,346	31	Ward	6,084
7	Thomas	13,017	32	Baker	6,013
8	Evans	12,555	33	Martin	5,898
9	Roberts	10,617	34	Morris	4,888
10	Johnson	9,468	35	James	5,755
11	Robinson	9,045	36	Morgan	5,691
12	Wilson	8,917	37	King	5,661
13	Wright	8,476	38	Allen	5,468
14	Wood	3,238	39	Clarke	5,309
15	Hall	8,188	40	Cook	5,300
16	Walker	8,088	41	Moore	5,269
17	Hughes	8,010	42	Parker	5,230
18	Green	7,996	43	Price	5,219
19	Lewis	7,959	44	Phillips	5,124
20	Edwards	7,916	45	Watson	4,771
21	Thompson	7,839	46	Shaw	4,759
22	White	7,808	47	Lee	4,731
23	Jackson	7,659	48	Bennett	4,671
24	Turner	7,549	49	Carter	4,648
25	Hill	7,192	50	Griffiths	4,639
				Total	440,911

and 8 of marriages; and although the inquiry might have been extended over a more lengthened period, it was found that the results were in general so constant as to render a further investigation unnecessary. When arranged according to the numbers in each index, the names appeared almost always in the same order, and the variations, when they occurred, rarely affected the position of a name beyond one or two places. These 50 names embraced nearly 18 in every 100 of the persons registered. The 3 names at the head of the list, Smith, Jones, and Williams, are, it will be observed, greatly in advance of the others; and if the numbers may be taken as an index of the whole population, it would appear that on an average one person in every 28 would answer to one or other of these 3 names.

Regarded with reference to their origin, it seems that of the 50 most common names more than half are derived from the Christian or forename of the father, and are thus literally *sire*-names or *sirnames*. This is the most primitive form of a second name, and it was extensively used amongst the Anglo-Saxons as well as by other European nations. Names derived from occupations are next in number, and contribute 13 to the list. After the Smiths come the Taylors, who are about half as numerous as the Smiths; next the Wrights, amounting to about half the number of the Taylors; then the Walkers, Turners, Clarks, Coopers, Wards, Bakers, and Clarkes. The Clarks and the Clarkes, if taken collectively, would occupy the third place in the list of names derived from employments; a fact which points significantly to the importance attached to the clerkly office, and to the possession of a moderate amount of learning, in rude and unlettered times, when a king received his characteristic epithet (Beau-clerc) from his scholarship. This class of surnames is peculiarly instructive as illustrating the pursuits and customs of our forefathers; many of them furnish evidence of a state of society impressed with the characteristics of feudal times; and not a few are derived from terms connected with the amusements of the chase and other field sports to which our ancestors were so ardently attached. Widely different would be a national nomenclature derived from the leading occupations of the present day. The thousands employed in connexion with the great textile manufactures would take precedence even of the Smiths; while the Taylors would give place to the shoemakers (now scarcely recognizable under the not common surname of Suter with its variations, Soutter, Sowter, &c.), as well as to the Colliers, the Carpenters, the Farmers, and others. The Hawkers, Falconers, Bowyers, Fletchers, Arrowsmiths, Palmers, Pilgrims, Friars or Frères, and a host of other family names derived from various callings which have become obsolete in this country, would be wanting. Seven of the 50 surnames belong to the class of local surnames, and are expressive of situation, as Wood, Hall, Green, &c.; and two (Brown and White) are derived from personal peculiarities.

The surname of Smith is pre-eminently the most common in England, as that of Jones is in Wales; and so great is the multitude of the Welsh Joneses, that the latter name not only enters into competition for priority in point of numbers with the Smiths, but in several years shows a majority over its rival. With a view to determine the relative frequency of these two widely-spread surnames, the numbers of each entered in the indexes during the years 1838–54 have been ascertained. The result is that the births, deaths, and marriages of the Smiths registered in this period were 286,037, and those of the Joneses 282,900, the excess in favour of the former being 3,137 in the 17 years. Smith is, therefore, unquestionably the most common surname amongst us, though the Joneses are little less numerous, and

in six of the years actually contributed to the registers larger numbers than the Smiths. Together, the bearers of those two common names amounted to 568,937, or 1 in 36 of the whole number registered, during the period referred to.

Assuming that the persons of the surnames of Smith and Jones are born, marry, and die in the same proportions as persons of *all surnames*, it will follow that in England and Wales there are not less than *half a million* of persons bearing one or other of those two surnames. The Smiths, amount to rather more than a quarter of a million, and the Joneses to little less; together forming no inconsiderable portion of the English population. These numbers represent, on the assumption that the average number of persons in a family is the same as in the whole population at the Census, viz., 4·8 persons, about 53,000 families of Smiths, and 51,000 families of Joneses; and to give an illustration of their numerical powers, it may be stated that these two great tribes are probably sufficiently numerous to people the four towns of Birmingham, Bristol, Leeds, and Hull, without any addition of persons of other surnames.

Upon the facts derived from the indexes of the registers for the year 1853, the probable number of persons in England and Wales bearing each of the 50 most frequent surnames has been computed. From this estimate it appears that the persons by whom these 50 surnames are borne amount to about 3,253,800; nearly one sixth of the entire population of England and Wales. On an average, it seems, one person in 73 is a Smith, one in 76 a Jones, one in 115 a Williams, one in 148 a Taylor, one in 162 a Davies, and one in 174 a Brown.

It is sometimes useful, in dealing with an extensive list of names, to know the proportionate numbers commencing with each letter of the alphabet. With such information, the names may be subdivided, according to the initial letters, in groups, large or small, so as to secure tolerably equal numbers in each group. The experience of the department in this respect, derived from the registration indexes, shows that the letter B is the most frequent initial of surnames amongst us, comprising more than a tenth of the whole. Next in number are the surnames ranked under the letter H (9·5 per cent.); then those under S. and W. (8·9 and 8·7 per cent.) The vowels, which enter largely into the words of the English language from their occurrence in the prefixes *ab*, *ac*, *ex*, *in*, *im*, *un*, &c., are not extensively used as the initial letters of surnames; and amongst the consonants N and K are the first letters of the fewest surnames, except X and Z. As many words in common use, chiefly of Anglo-Saxon origin, have been adopted as surnames, the philologist may probably trace some relation between the surnames and the words of the language beginning with the same letters; but so large have been the additions made to the English vocabulary in modern times, that such a connexion is by no means obvious in reference to the words now found in our dictionaries. (16th Annual Report, pp. xvii–xxiv.)

APPENDIX.

APPENDIX.

THE "FARR TESTIMONIAL FUND."

As soon as it became known that Dr. Farr had resigned his appointment as Superintendent of the Statistical Department of the Registrar General's Office, a general feeling prevailed among those who fully appreciated the value of his public services, especially with reference to their influence upon the progress of public health in England, that some effort should be made to secure for them some public recognition. A meeting of those interested in this project was held at Somerset House, early in April 1880, at which the Earl of Derby had consented to take the chair. It was decided to start a Farr Testimonial Fund, and an Executive Committee was appointed to carry the proposal into effect. Mr. Richard B. Martin, M.P., agreed to act as Honorary Treasurer, and Mr. Noel A. Humphreys, of the Registrar General's Office, as Honorary Secretary. Measures were taken to bring the Farr Testimonial Fund under the notice of the general body of the medical profession, and of the Members of the Royal Society, Statistical Society, Institute of Actuaries, British Association, and Social Science Association, with all of which Societies Dr. Farr had been more or less intimately connected. More than 20,000 circulars, setting forth the object of the movement, and asking for subscriptions to the fund, were thus distributed. During more than twelve months the efforts of the Executive Committee were directed to the promotion of the fund, and resulted in the collection of 1,132*l.* 3*s.* 6*d.* The following is a full list of the subscriptions:—

LIST OF SUBSCRIPTIONS.

	£	*s.*	*d.*
The Earl of Derby	50	0	0
De Cappelaine, J.	52	10	0
Heywood, James, F.R.S.	25	0	0
Proprietors of *The Lancet*	50	0	0
Carpenter, Alfred, M.D.	20	0	0
Apothecaries' Society	10	10	0
Graham, Major George	20	0	0
Curling, T. B., F.R.S.	5	5	0
Tuke, T. Harrington, M.D.	5	5	0
May, George, F.R.C.S.	1	1	0
Simon, John, C.B., F.R.S., D.C.L.	5	5	0
De Chaumont, F., M.D., F.R.S.	1	1	0
Rigden, George, M.R.C.S.	1	1	0
Jevons, W. Stanley	1	0	0
Hill, Alfred, M.D.	1	1	0
Westgarth, W.	10	10	0
Westgarth, W. (2nd don.)	10	10	0
Chadwick, Edwin, C.B.	10	0	0
Pitter, Joseph	2	2	0
Hassall, Arthur Hill, M.D.	2	2	0
Logie, Cosmo Gordon, M.D., F.R.C.S.	2	2	0
Martin, R. Biddulph, M.P.	10	10	0
Grimshaw, T. W., M.A., M.D.	3	3	0
Druitt, Robert, M.D.	2	2	0
Clover, Joseph Thos., F.R.C.S.	2	2	0
Stevenson, Thos., M.D.	1	1	0

	£	*s.*	*d.*
Paget, Sir James, Bart., F.R.S.	5	5	0
Bailey, A. H., Pres. Inst. Act.	5	5	0
Spottiswoode, William, Pres. R. S.	2	2	0
Erichsen, John Eric, F.R.C.S.	10	10	0
Henniker, Sir Brydges P., Bart.	5	0	0
Clode, William	3	3	0
Fayrer, Sir Joseph, K.C.S.I., F.R.S.	2	2	0
Oakes, Thomas	2	2	0
Humphreys, Noel A.	2	2	0
Thomson, James	10	10	0
Acland, Henry W., M.D., F.R.S., D.C.L.	5	0	0
Burrows, Sir George, Bart., M.D., F.R.S.	5	5	0
Greenhill, W. A., M.D., Oxon	2	0	0
Carillon, Wilson, F.S.A.	2	2	0
The Earl of Shaftesbury, K.G.	10	0	0
Jenner, Sir William, Bart., K.C.B., M.D.	5	5	0
Bennett, J. Risdon, M.D., L.L.D., F.R.S.	2	2	0
Frankland, Professor, F.R.S.	5	5	0
Fraser, Thomas R., M.D., F.R.S.	2	2	0
Vacher, Francis, F.R.C.S.	2	2	0
Gairdner, Professor W. T., M.D.	5	5	0
Rawlinson, Robert, C.B.	5	0	0
Corfield, W. H., M.A., M.D.	2	2	0
Monat, Fred. John, M.D.	5	5	0

	£	s.	d.
Lewis, James	2	2	0
Balding, E. B., F.R.C.S.	2	2	0
Saunders, W. Sedgwick, M.D.	5	5	0
Hamilton, Archibald	10	10	0
Janson, F. H.	5	5	0
Newmarch, William, F.R.S.	10	10	0
Philipson, G. H., M.A., M.D.	2	2	0
Norman, George Ward	25	0	0
Hart, Ernest	5	5	0
Brassey, Thos., M.P., Pres. Statis. Soc.	10	10	0
Lord Aberdare	10	10	0
Watson, Sir Thos., Bart., M.D., F.R.S.	10	10	0
Lubbock, Sir John, Bart.	5	5	0
MacLaren, A. C.	5	5	0
The Earl Fortescue	10	0	0
Lord Houghton, D.C.L., F.R.S.	5	5	0
Bristowe, John Syer, M.D.	3	3	0
Bain, W. Pellew, M.D.	3	3	0
Ogle, William, M.D.	2	2	0
Rendle, William, F.R.C.S.	2	2	0
Rendle, George, M.R.C.S.	2	2	0
Walter, John, M.P.	20	0	0
Gull, Sir William W., Bart., M.D.	10	0	0
Latham, B., C.E.	5	15	6
Lord Ebury	10	10	0
Eassie, W., C.E.	2	2	0
Watson, J. W.	1	1	0
North, S. W., M.R.C.S.	1	1	0
Richardson, B. W., M.D., F.R.S.	5	5	0
Field, Rogers, C.E.	5	5	0
Hubbard, Right Hon. J. G., M.P.	10	10	0
Robinson, W. K., M.D.	2	2	0
Pagliardini, Tito	1	1	0
Ligertwood, Thomas, M.D.	1	1	0
Buchanan, George, M.D.	3	3	0
Montefiore, Nathaniel	10	0	0
Ransome, Arthur, M.D.	2	2	0
Liddle, John, M.R.C.S.	2	2	0
Vian, W. J.	1	1	0
White, Joseph, F.R.C.S.	2	2	0
Guy, W. A., M.B., F.R.S.	10	10	0
Longstaff, G. B., M.B.	20	0	0
Tyndall, John, F.R.S.	5	5	0
De la Rue, Warren, F.R.S.	5	5	0
Harrison J. Thornhill	1	1	0
Lord Mount-Temple	5	0	0
Harcourt, A. V., F.R.S.	1	0	0
Taylor, John Edward	2	2	0
Smith, Protheroe, M.D.	2	2	0
Kent, C.	1	0	0
Smith, Robert Mackay	2	2	0
Wilkinson, Thomas Reed	2	2	0
Sprague, Thomas Bond	5	5	0
Spalding, Samuel	5	5	0
Messent, John	2	2	0
Lovegrove, Natalie	5	5	0
Welton, Thomas A.	2	2	0
Christison, Sir Robt., Bart., M.D.	5	5	0
Rivers, Major-General A. P.	2	2	0
McKewan, Wm.	3	3	0
Gibbs, G. S.	2	2	0
Darwin, Charles, F.R.S.	5	5	0
Bourne, Stephen, F.S.S.	1	1	0
Jamison, Patrick	0	5	0
Smith, Colonel J. S.	2	2	0
Hill, Frederic	1	0	0
Philip, George	5	5	0
Winch, W. R.	2	2	0
Cleghorn, J.	2	2	0
Copperthwaite, W. C.	2	2	0
Goodman, J. D.	2	2	0
Russell, J. A., M.B.	1	0	0
Hodge, W. B.	5	0	0
Mocatta, F. D.	5	5	0
Albright, Arthur	2	2	0
Willans, J. W.	1	1	0
Beddoe, J., M.D., F.R.S.	1	1	0
Thomas, C. J., J.P.	1	1	0
Blower, Benjamin, M.R.C.S.	1	1	0
Sanders, W. R.	5	5	0
Baines, Mrs. M. A.	3	0	0
Armitage, T. R., M.D.	2	2	0
Clark, Sir John	2	2	0
Lord Napier of Magdala	3	3	0
Bunyon, C. J.	2	2	0
Bayley, J.	2	2	0
Windeatt, John	1	1	0
Paget, Joseph	1	0	0
Andrew, J., M.D.	2	2	0
Greig, J. A.	1	1	0
Balfour, General Sir George, M.P.	5	5	0
Brennan, A.	2	2	0
Scott, Exors. of Russell	25	0	0
Brind, F. W.	5	5	0
Duke of Devonshire	20	0	0
Morley, Samuel	10	10	0
Williams, C. J. B., M.D., F.R.S.	5	5	0
Barrett, T. B., M.R.C.S.	1	1	0
Nightingale, Florence	10	10	0
Farmer, James	1	1	0
Darwin, G. H.	2	0	0
Homersham, T. C.	5	5	0
Atkin, W., M.D., F.R.S.	1	1	0
Baylis, C. O., M.D.	1	1	0
Palgrave, R. H. Inglis	5	5	0
Welsh, J. Kemp, J.P.	5	5	0
Bratton, J., F.R.C.S.	1	1	0
Anderson, Mrs. E. G., M.D.	2	2	0
Macpherson, H. M.	2	2	0
Brodie, Sir B. C.	3	3	0
Hannyngton, Major-Gen.	3	3	0
Singer, C. Douglas	5	5	0
Buchanan, Andrew, M.D.	2	2	0
Sanderson, J. Burdon, M.D., F.R.S.	2	2	0
Lawson, Inspector-General R.	3	3	0
Prestwich, Joseph, F.R.S.	2	2	0
Bowles, Robert L., M.D.	2	2	0
Crothers, R., M.D.	1	1	0
Hendriks, Frederick	2	2	0

	£	s.	d.
Lewis, Waller A., M.B.	2	2	0
Farre, Arthur, M.D., F.R.S.	2	2	0
Sibley, S. W., M.D.	3	3	0
Hiff, W. T., M.D.	1	1	0
Rogers, H., M.R.C.S.	2	2	0
Russell, Hon. F. A. R.	1	0	0
Stephenson, E. J.	2	2	0
Wilkinson, R.	2	2	0
Begley, W. C., M.D.	3	3	0
Baylis, Mrs. C. O.	1	1	0
Morris, Thomas, M.D.	5	5	0
Thomas, G. D. P., M.D.	1	1	0
Priestley, W. O., M.D.	5	5	0
Cleaton, John D., M.R.C.S.	5	5	0
Williams, F. J.	0	10	6
Hill, Berkeley, F.R.C.S.	3	3	0
Ace, the Rev. Daniel, D.D.	1	1	0
Wells, T. Spencer, F.R.C.S.	5	5	0
Tidy, C. Meymott, M.B.	1	1	0
Quain, Richard, F.R.C.S., F.R.S.	5	0	0
Radford, Thomas, M.D.	1	1	0
Hallett, J. G. P., M.A.	6	6	0
Waters, A. C.	0	5	0
Balfour, J. Graham, F.R.S.	2	2	0
Sayer, G. E. H.	0	2	6
Brown, J. B.	2	2	0
Tytheridge, H. B. H.	0	5	0
Roth, Matthias, M.D.	1	1	0
Sutherland, John	5	0	0
Hawkesley, Thomas, M.D.	1	1	0
Dunbar, Eliza W., M.D.	1	1	0
Elliott, Robert	1	1	0
Dickson, Frank, F.R.C.P.	1	1	0
Wilkes, James, F.R.C.S.	5	0	0
Martin, J. B.	5	5	0
Thompson, Sir H.	5	5	0
Tonsino, P.	1	0	0
Clapham, J.	2	2	0
Jones, George I., M.D.	1	1	0
Lee, John, L.S.A.	1	1	0
Soames, E.	5	0	0
Pochin, J. D.	5	5	0
Porter, G. H., M.D.	2	2	0
Chapman, J. H.	1	1	0
Little, James, M.D.	2	2	0
Martin, James, M.D.	1	1	0
Porter, H. W., B.A.	2	2	0
Winstone, Benjamin, M.D.	1	1	0
Ballard, Edward	1	1	0
De Grave, J. F., M.R.C.P.	10	10	0
Davis, T.	1	1	0
Foster, M., M.D., F.R.S.	1	1	0
Davis, E., M.R.C.S.	1	1	0
Wilson, J. H., M.K.Q.C.P.	1	1	0
Tatham, J. F. W., M.D.	1	1	0
Wilson, E. J., M.B.	1	1	0
Tilley, S., F.R.C.S	2	2	0
Shiers, D., M.D.	1	1	0
Barnes, Robert, M.D.	2	2	0
Thompson, James, M.D.	1	1	0
Jellicoe, Charles	1	1	0
Mapother, E. D., M.D.	1	1	0
Holden, Luther, F.R.C.S.	5	5	0
Mann, Horace	2	2	0
Wood, Mrs. S. G.	5	0	0
Cadge, William	2	2	0
Webb, F. E., M.R.C.S.	1	1	0
Sutton, J. Maule, M.D.	2	2	0
Hastings, G. W., M.P.	10	10	0
McIntyre, J., M.D.	2	2	0
Keeling, J. H., M.D.	1	1	0
Langshaw, J. P., F.R.C.S.	1	1	0
Major, H. C.	1	1	0
Hollis, W. M., M.R.C.S.	1	1	0
Hughes, H. S., M.R.C.S.	2	2	0
McKellar, E., M.D.	1	1	0
Hardman, William, M.B.	1	1	0
Williams, R. Price	2	2	0
Tripe, J. W., M.D.	1	1	0
Sykes, J., M.D.	1	1	0
Eddowes, A., M.D.	1	1	0
Eddowes, W., M.R.C.S.	1	1	0
Rayne, S. W., F.R.C.S.	2	2	0
Page, H., M.R.C.S., S.Sc. C. Cantab.	1	1	0
Turner, G.	1	1	0
Rix, W. H., M.R.C.S.	2	2	0

With the full concurrence of Dr. Farr, the amount of subscriptions, less the expenses for printing, advertising, postage, &c., was invested in Bank of England Stock in the names of the Honorary Treasurer and of the Honorary Secretary, as Trustees, on the understanding that the dividends should from time to time during his lifetime be re-invested, and that after his death the dividends of the accumulated fund should be applied by the Trustees to supplement the slender provision that Dr. Farr had been able to make for the support of his three unmarried daughters.

On the death of Dr. Farr in April 1883, the Executive Committee of the Testimonial Fund brought the claims of Dr. Farr's daughters before the Government in the hope that some pension might be allotted to them, but the efforts on their behalf only resulted in a contribution of 400*l.* to the Testimonial Fund. Miss Nightingale, who had originally subscribed ten guineas to the Fund, made a further donation of 100*l.* to the Fund on Dr. Farr's death. These sums, together with the sum of 92*l.* 13*s.* 6*d.*, which had accrued as dividends, were also invested in Bank of England Stock. The Fund was not finally closed until after the receipt of the

October dividends in 1883. The following Balance Sheet, audited by Messrs. J. O. Chadwick and J. Whittall, sets forth the receipts, disbursements, and investments in connexion with the Fund:—

FARR TESTIMONIAL FUND.

BALANCE SHEET.

Receipts.

	£ s. d.
Subscriptions received (as per Detailed List) -	1,132 3 6
Government Donation to Fund - - -	400 0 0
Miss Nightingale, additional subscription - -	100 0 0
Dividend Bank of England Stock (6 Oct. 1881) -	15 3 11
Do. do. (6 April 1882) -	16 15 11
Do. do. (6 Oct. 1882) -	16 15 11
Do. do. (6 April 1883) -	18 1 10
Do. do. (6 Oct. 1883) -	25 15 11
	£1,724 17 0

Disbursements.

	£ s. d.
Printing, Lithographing, &c. - - -	44 9 6
Advertisements ("Times" and "Eddowes Journal")	37 6 0
Envelopes - - - - -	8 17 3
Addressing covers, copying letters, &c. - - -	10 16 3
Postage (19,747) Circulars - - - -	82 5 7
Expenses of Irish Committee - - - -	1 1 0
Extra postages, cabs, porters, &c. - - -	2 6 8
	187 2 3

£ s. d.			
Purchase (319 18 11) Bank of England Stock (23/3/81)			920 0 0
Do. (24 11 8)	do.	(2/3/83)	73 17 0
Do. (6 0 4)	do.	(12/4/83)	18 1 10
Do. (165 4 7)	do.	(23/8/83)	500 0 0
Do. (8 9 7)	do.	(16/10/83)	25 15 11
£521 8 1			

	£1,724 17 0

We have examined this Statement in detail with the Vouchers and Bankers' Account, and found it correct.

J. O. CHADWICK } *Auditors.*
J. WHITTALL }

London, Dec. 5th, 1883.

RICHARD B. MARTIN, M.P., *Hon. Treasurer.*
NOEL A. HUMPHREYS, *Hon. Secretary.*

From the above Balance Sheet it may be seen that the total amount received on behalf of the Fund, including the re-invested dividends, was 1,724*l.* 17*s.* 0*d.*, and that the total expenses were 187*l.* 2*s.* 3*d.* When the Fund was finally closed, and the Balance Sheet audited on 5th December 1883, the nominal amount of Bank Stock standing in the names of the two Trustees was 524*l.* 8*s.* 1*d.*, which at the quoted price of the day was worth 1,550*l.* 15*s.* 6*d.* This was the net result of the Farr Testimonial Fund.

NOEL A. HUMPHREYS,
Honorary Secretary.

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