CHAPTER XVIII

CONCLUSION

"Like every new force, industrialism has to many the aspect of a monster. When it has familiarised itself this uncouth appearance will seem no more horrible than that of the locomotive. It is the old and haggard things like war and tyranny, disease and squalor, that will seem more and more repulsive as the world moves on. As the snorts and hisses of the first locomotives soon subsided into the 'puff-puff' beloved by every child, so will the awkward and ferocious gestures of infant industrialism become the ordered rhythm of the great forces moving the whole world's machinery."

The Railway Centenary.

RANDALL DAVIES.

THIS study has only dealt with England and Wales but the advance in medicine was European, neither were the improvements in agriculture and in towns confined to this country. Bateman speaks of "the gradual and happy amelioration of the health of the metropolis, which has been synchronous with the changes of the circumstances above described[1] and this not only here, but in every large town in Europe".[2] Another writer says, "In almost every civilized country of Europe . . . every succeeding ten years produce a smaller annual proportion of deaths."[3] The disorders on the Continent due to the wars were, however, a strong counteracting influence there, though some contemporary writers hold that the centralized governments and bureaucracies had achieved more than we had. But allowance must always be made for the English habit of self depreciation both in comparison with other countries and other periods.[4] Such statistics as are available seem to show that while improvement had taken place on the Continent it was to a less extent than in Great Britain.[5] Farr in McCulloch's

"British Empire" states, "There cannot, in fact, be a question that the value of life, in England and Wales, regularly increased from 1740 or 1750 down to 1815; and there are good grounds for thinking that it then exceeded its value in any other country, with the exception of Scotland." Bisset Hawkins writing in 1829 declares roundly that "the mortality of Great Britain, its cities and its hospitals, is greatly inferior to that of any other country in Europe"[7]; and adds, "this superior value of life in Great Britain is not confined to any particular districts, or classes of individuals. To whatever point we turn our view, the advantage is still the same: the man of affluence, the pauper patient of the hospital, the sailor and the soldier on active service, the prisoner of war, the inmate of a gaol, all enjoy a better tenure of existence from this country than from any other of which we have been able to consult the records." He also says that, "It is indisputable, that the average proportion of deaths in England and her cities is less than that of any other country of Europe. And it may be added, that the powers of body and of mind are preserved to a late period in higher perfection here than in other countries . . . An analagous condition of health and vigour may be also observed in our animals and in our vegetation; and if it should be replied, that this excellence is owing to the care bestowed on their culture, the answer applies equally to the human being, on whom more attention is here bestowed, and who is really an object of greater value here than elsewhere."[3]

This latter opinion was general among educated persons who had travelled on the Continent. Lowe in 1822 writing as to the abuses of the Poor Law refers to the reluctance "of many benevolent minds to reduce our allowances to the poor", especially those who were familiar with conditions on the Continent and had there "witnessed the habitual privations of even the sober and industrious among the lower orders who have families".[7]

Many contemporary authorities could also be quoted who voiced the opinion that conditions in England of the "industrial revolution" compared favourably, not only with those then prevailing in more backward countries, but with those that

had prevailed in earlier periods at home. For instance, Howlett writing in 1781 when the fact of an increased population was still questioned, was almost lyrical: "Our commerce during" the last 50 or 100 years "has been extending itself into every quarter of the globe; our manufacturers have been multiplying and improving to an astonishing degree; our agriculture has been daily receiving additional extent and additional perfection; dreary marshes and barren wastes have been gradually transformed into rich pastures, meadows, and cornfields; small hamlets have grown into considerable villages, and villages have swelled into large and populous towns. Nor have we, mean time, suffered those public calamities, which, in former ages, frequently spread such dreadful devastation among the human species. Neither famine nor pestilence have repeated, in the present century, their periodical visits, which heretofore used to sweep such multitudes to the grave, and desolate both town and country. . . . the arts of medicine and surgery have made no inconsiderable advances . . . to alleviate the miseries of life and not uncommonly prolong its duration." [8]

Blane writing in 1813 when the fact of the increase was well established says, "the counteraction of typhus by means of cleanliness and ventilation; of the small pox by vaccination in our times; and of agues in the country by the draining of marshes, and in towns by the construction of sewers, and the cleansing of the streets in the 17th and 18th centuries, are undeniable proofs of the power of human art in preventing and extinguishing diseases." [9] While Roberton, who was not unduly optimistic, wrote in 1827, "Reverting to a period as yet little more than a century removed, we find many fatal diseases prevailed then, depending chiefly on circumstances in the condition and habits of the people, the state of the soil, and want of medical knowledge, which now are unknown, or so modified as to excite comparatively little attention. Such were the plague, the milliary fever, rickets, dysentery, spotted and intermittent fevers; and it is our own disgrace if we cannot add small pox. Within the last 70 years, the habits of the lower classes especially, have been rapidly improving; and as there can be no question that the moral more than the physical condition of human beings, influences the rate of mortality, we may hope for yet greater improvement in the healthiness and comfort of our population." [10]

This improvement was largely achieved during the rigours of a hard fought war and during the still more difficult years of trade depression and poverty which followed it. To some extent, however, the improvement was not in spite of the war but because of it. As a writer in 1818 said, "The free and unsophisticated practice of English Medical Officers in the Army and Navy, during the late war, has done much to elevate the rank of their art, heretofore abused by mysteries, formalities, and mercenary intrigues." [11] There is much to put on the debit side of war, but on the credit side must be placed its stimulus to the art of medicine.

There is no necessary contradiction between the reiterated statements as to improvement and the equally reiterated description of the terrible surroundings amid which numbers were still living. In comparing the conditions in different periods a good deal of confusion is caused by vague terms such as "the mass of the people", "the lower orders", "the poor".[12] In reading contemporary descriptions it is often difficult to tell to what sections or to how many of the people a particular statement applied. Herein lies the source of much error. If a perfectly true and unexaggerated description of a modern slum were to be given and the reader left to infer that the bulk of the working classes were living under such conditions, the present death rate would be incredible. Improvements in health conditions, as a rule, have begun with the rich and have spread gradually to poorer and poorer sections of the population. In some matters of health a modern slum dweller is better off than a 17th century prince; he is probably so in regard to water supply and is certainly so in regard to medical attention. In the 18th century fairly reasonable health conditions became available for the well-to-do and for the higher ranks of the workers and, in some directions, there was amelioration even for the very poor.

In comparing the early 19th century with previous periods it has also to be remembered that it was during this period that

the mass of the people first became in some degree articulate. We know nothing, or hardly anything, of what the peasant thought of his lord, or the medieval porter of the rich merchant. A few words here and there, handed down in a ballad or a legend alone hint at forgotten discontents. What did the peasants say, when the lord feasted in the midst of Famine? What did the people of London say when their rulers fled from the plague and left them to their misery? Their bitter comments died with them. Not so the complaints of the Industrial Revolution, they survive in innumerable newspapers and pamphlets. Not only were these produced by the workers themselves but by hosts of sympathisers among the well-to-do and literature began to be full of the wrongs of the people. This was partly the result of democracy. The best way to right a wrong was no longer to present a petition to a king or noble but to produce a popular novel exposing the wrong. Moreover, the growing power of man over nature made people feel that much of the evil was preventable and, if preventable, why not prevented? Previous ages had stood helpless in the face of disease and famine and had tried to forget them. Art had been one of the principal means to this end, its main function had been to provide beauty in a world full of very ugly things while much Victorian art was essentially didactic and moral. It must not, however, be assumed that the writers of previous ages could not have found plenty of misery to describe and wrongs to inveigh against had they wished to do so. Some of the less agreeable features of low life are, indeed, described with great vividness by certain 18th century novelists. These descriptions, however, are only incidental and, of course, the novels themselves are less familiar than those of the Victorians. The numerous commissions and committees of enquiry were a further expression of the awakening of the public conscience. Again it must not be assumed that fit subjects for such enquiries did not exist in previous ages.

Our period was one of economic and social transition, though of less rapid transition than has often been imagined. Man being a social animal is necessarily bound by custom, routine and habit. He tends to dislike change in itself and since, in

this imperfect world even beneficient change is apt to bring with it new difficulties, the evil side of the change is likely to be stressed more than the good. Man develops an extraordinary moral resistance against accustomed ills so that new evils really cause more acute suffering simply because they are new. Hence the universal tendency to deprecate the present, to regret the "good old times", which were yet not as good as still earlier times, which in their turn were but a dim reflection of the lost Golden Age. It is not claimed, therefore, that the new conditions did not cause suffering; subjectively they may have caused more suffering than the earlier conditions. It is not even claimed that in some directions and for some individuals, material conditions were not worsened. But it is claimed that, on balance, material conditions improved enormously for the people as a whole between 1760 and 1815. To hold this opinion, it is not necessary to give the lie to a single one of the descriptions upon which advocates of the theory of deterioration base their case. According to early 20th century standards, the conditions at the beginning of the 19th century were appalling. But what will the 21st century say of ours? If, however, the historians of that epoch are just they will admit that, "bad as were the conditions at the beginning of the 20th century, especially after the Great War, they were a marked improvement over those of a hundred years previously, the lowered death rate in itself proves this." The statement remains true if for 19th century is written 20th. Advancing civilization led, between the years 1750 and 1825, to a reduction of the death rate from about 35 per 1000 to about 20 per 1000 in England as a whole and in London from about 50 per 1000 to about 29 per 1000.

Chaotic as some aspects of industrial life may have been in the early 19th century, yet civilization was passing from the primitive to the complex. With that passing came a diminution of the evils associated with primitive civilization. The growth of commerce and the improvement of transport had made the food supply more plentiful, more varied and, above all, more certain. The effect of the changes in commerce and transport upon agriculture was partly direct, since the food supply could obviously be drawn from a wider area, but these

changes also led indirectly to a revolution in agricultural technique. So that Famine, which had destroyed untold millions in previous ages, had been abolished in England in our period; deaths from diseases caused by improper diet had also been reduced to negligible proportions.

We can talk lightly of Famine, it is so remote from the experience of even the poorest of us. The bald facts, as related in old chronicles or in the pages of the Indian Famine Commission, leave us cold. Literature alone can give us some dim comprehension; the vivid poetry of the Old Testament; the glimpse in Piers Plowman of he who, after meeting Famine, "looked like a lantern all his life after." But though this touches us, it is only the unrealizing response to a poet's imagination. We cannot grasp that, until modern times, our own countrymen suffered these things and that those still living in primitive conditions suffer them still. Pestilence, perhaps, we can visualize more vividly than Famine, for epidemic disease is not yet conquered. But do we really grasp what the wiping out in a few months of one-quarter of the population of a town, meant to the survivors? Do we really comprehend the general atmosphere of terror and helpless despair? Do we realize all that the total stagnation of trade meant in hopeless poverty? Nor is it true that these scourges had at least the advantage of striking all equally. The rich never died of famine, though they possibly suffered some inconvenience. The rich suffered less from pestilence than the poor, since they could leave plague stricken districts.[11] Inequality is no invention of modern times, in fact it is only modern organization that makes the hope of the abolition of gross inequality something more than a chimera.

Whatever may have been the proximate cause of the subjection of pestilence in Western Europe this subjection was undoubtedly associated with advancing civilization. It was the result of that same practical, yet adventurous, spirit, that gave us the steam engine, the railway and modern agriculture, and of which we have a further manifestation in modern medicine.

It is impossible to give even the crudest quantitative valuation to the different factors, the improvements in agriculture, in industry, in town hygiene and in medical science. But this is of little importance because, as suggested at the beginning of this study, all these movements are essentially differing aspects of one movement. They are all part of that modern world which, as an eminent economist remarked, we cannot judge rightly unless we remember its youth. Nor can we judge it rightly unless we also remember how age-long are most of the ills of mankind. We are yet on the threshhold of the door which science and freedom have opened and the study of the last two centuries, viewed in the right perspective, leads, not to a paralysing pessimism, but to an optimism illumined by the brightest hopes for the future of mankind.

APPENDIX

Notes and References

(In many cases the titles are only given in these notes in an abbreviated form. For full titles readers are referred to the Bibliography.)

CHAPTER I. Introduction.

[1] Liston. Plague. British Medical Journal, 1924.
[2] This is no longer literally true, but presumably the motor car has not yet affected the life of the mass of the people.
[3] Rice, Colliver. Persian Women and their Ways. 1923.
[4] Hosie. Two Gentlemen of China. 1924.
[5] Knowles. Economic Development of the Empire. 1924.

CHAPTER II. Vital Statistics.

[1] Enc. Brit. "Statistics."
[2] Hankins. Adolphe Quételet as Statistician. 1908.
[3] Finlaison. Report to Treasury on Life Annuities. 1829.
[4] Enc. Brit. "Insurance."
[5] This is the survival of a very ancient belief. See Frazer. Folklore in the Old Testament.
[6] Civil registration was introduced in the year 1836, and nominally it was made compulsory in the following year, but in fact it was not so until 1874, in which year penalties were introduced for non-compliance with the regulations.
[7] Short. Bills of Mortality. 1750.
[8] Ibid.
[9] Birch. Bills of Mortality. 1759.
[10] Edmonds. Law of Mortality in England. 1835. Lancet, Vol. I.
[11] Malthus. 1825 ed., p. 217.
[12] Birch, supra.
[13] The original tables were published at Carlisle in tract form in 1797, and had previously been inserted in Hutchinson's History of Cumberland (in 1794). They do not seem, however, to have attracted any attention until Milne's publication. Milne calculated Life Tables from and annotated the originals.

CHAPTER III. Population Statistics, Birth and Death Rates.

(*a*) Population in the 17th Century.

The facts as to the growth of population in the 17th century are extremely obscure, but the balance of such evidence as exists seems in favour of a

slow increase. It is true that some 17th century writers feared over-population and advocated colonization as a remedy. But in times of bad harvest and economic dislocation and consequent food shortage, unemployment and heavy poor relief, contemporaries are very apt to jump to the conclusion that the evils are due to over-population. Moreover, many of the writers were anxious for increasing colonization and therefore met the possible objection that colonization would deplete the mother country, by alleging that the latter was over-populated. Probably the rapid growth of London and its environs led many persons to suppose that the whole population was growing rapidly. Lastly, in a society which was relatively stable and inelastic, even a moderate rate of growth might be a source of embarrassment. A rate of growth which appears to us very slow might well have appeared excessive in the 17th century.

(*b*) The Effect of the Civil War.

At one period it was believed and taught that the Civil War affected the prosperity of this country to a very slight degree. Modern research does not support this view. The armies withdrew a considerable proportion of the workers from production and the requisitions and heavy taxation laid a great burden upon the people. From the point of view of population, the army casualties were by no means insignificant. Apart from losses in battle, the armies suffered severely from epidemics and, in at least one case, spread these among the civil population. Large numbers of persons were also voluntarily or compulsorily expatriated owing to the Civil War. No doubt there were war profiteers of various kinds, including those who had sequestrated estates conferred upon them, or who bought such at a low price. These persons have left their monuments in the form of handsome mansions, which give an impression to posterity of general wealth in the Restoration period. But a study of the national finances tells a very different tale.

(*c*) Marriage, Birth, and Death Rates.

Marriage Rates are often stated per 1,000 of the total population. This is a very unreliable index for comparing different times and places owing to differences of age composition. This rate, however, is the only one available for early periods ; it is known as the *crude* marriage rate.

The number of marriages can be stated in terms of the marriageable persons, e.g. the numbers over 15 who are unmarried, widowed, or divorced.

Birth Rates may be stated as a rate per 1,000 of the total population living at all ages in the middle of the year. This is the *crude* birth rate. For many purposes it is a useful rate to ascertain, but it is obviously useless as a measure of fertility.

The corrected birth rate may be calculated from the proportion which the number of recorded births bears to the number of women living between the ages of 15–45. This eliminates the error due to the differing age and sex composition of two populations, but is no truer criterion of fertility than the crude rate.

A more accurate method is to subdivide the births into legitimate and illegitimate, stating the former per 1,000 of married women aged 15–45, and the latter per 1,000 of unmarried women aged 15–45.

For purposes of comparison of fertility at different times and places statisticians have devised an indirect method of standardizing birth rates, i.e. of making the necessary allowances for differences in the proportion of wives of 15–45 years to the total population. (For the method employed see Newsholme, Elements of Vital Statistics (1923), p. 86.)

General Death Rates. A general death rate is the number of deaths occurring among a given number, say 1,000, of the population in a given period, which period, unless otherwise stated, is taken to be a year.

The ratio between deaths and population is known as the death rate or rate of mortality. Actuaries, however, use the latter term to express the probability of dying in one year and use the term *central* death rate as synonymous with the term death rate as generally used.

This death rate, which simply expresses the proportion of deaths to each 1,000 of the population, is known as the *crude* death rate, to distinguish it from measures which are more exact for comparative purposes. The death rate for a particular area may be "standardized", i.e. its actual death rate corrected for age and sex composition by relating it to the age and sex composition of a "standardized" population. This standardization may be achieved either by a direct or by an indirect method. The former is slightly the more accurate but very laborious, and for its use detailed returns are necessary. The standardized death rate arrived at by the direct method was formerly known as the "corrected" death rate. This term is now applied to a standardized rate which has been further corrected for the deaths of non-residents. (The methods of standardization are described in detail in Newsholme, op. cit., chap. xix.)

For obvious reasons the crude death rate differs much less from the standardized death rate than does the crude birth rate from the standardized birth rate. The human being is a long time coming to maturity and often lives many years after the power of reproduction has been lost. If a population is growing by immigration the majority of the immigrants are likely to be young adults. This will raise the crude birth rate because it will raise the proportion of women of child-bearing age in the population; the emigration of young adults will have the opposite effect.

It was possibly a failure to appreciate the limitations of the crude birth rate that led to the legend of a great rise in the birth rate in the early 19th century. The high crude birth rate of the new towns was noted, it was assumed that the conditions of town life lead to greater natality and therefore, since the urban population was growing actually and proportionately, the birth rate was assumed to be rising. As a matter of fact the high birth rate in the towns was largely, if not entirely, accounted for by their age composition. (See p. 26.)

The crude death rate is also affected by the sex and age composition of the population, though to a less degree than the crude birth rate. The female sex has a superior expectation of life to the male and, in regard to age composition, the human being not only has a long immaturity, but comes into the world very helpless, and also extremely susceptible to many illnesses. The first year of life has always been and remains the most dangerous before the 7th decade. For the age group between 5 and 10 the death rate falls below the average for all ages and does not rise above it until the age group 45–50 ; it rises rapidly after 60, until the rate for extreme old age (to which few attain) surpasses even that of infancy. A relatively large proportion of infants and very young children will therefore in itself raise the crude death rate; the same will be true of a large proportion of old persons, while a large proportion of persons between 5 and 45 will in itself lower the total crude death rate.

It is extremely unlikely that any change in mortality due to more hygienic conditions or to an advance in medical knowledge will affect persons of all ages proportionately since the incidence of most diseases is different at different ages. The ultimate effects of a reduced death rate will depend, therefore, upon the decade of life in which the change is mainly or entirely operative. A reduced infant mortality will lead to a

further reduction, after a short interval, of the crude death rate and also of the crude marriage and birth rates and, after a longer interval, to increase of these rates for the reasons already stated. A reduced mortality which mainly affects young persons just entering the healthy period will almost at once have a more than proportionately good effect on the crude death rate and will also tend to raise the crude marriage and birth rates. A reduced mortality which mainly affects the middle aged and elderly will naturally reduce the crude birth rate. The reliance which can be placed upon the crude rates as indicators of social conditions is dependent upon the size of the population and upon the amount of emigration and immigration to which it is subject. For large populations which are also little affected by migration, the crude rates, especially the death rate, are reliable indicators, though even here it is not safe to base arguments upon small variations.

[1] George. Economic Journal, Sept., 1922.
[2] See supra.
[3] An allowance was made for illegitimate births.
[4] Quételet said that, "la fécondité des mariages ne varie pas sensiblement dans un même pays et dans le cours d'un siècle."
[5] Newsholme. 1st edition, 1889.
[6] Newsholme. 2nd edition, 1923, p. 102.
[7] Italics added.
[8] McCulloch. British Empire, 1st ed. 1837.
[9] Quoted by McCulloch in note on Population in the 1863 edition of the Wealth of Nations which he edited.
[10] Finlaison. Report to Treasury on Life Annuities.
[11] McCulloch. British Empire.
[12] Mansford. Parish Registers. London Medical Repository. 1818.
[13] It is interesting to note that the estimated birth and death rates for India for 1896–1905 were 38·58 and 34·2 respectively.
[14] Edmonds. Lancet. Vol. 1.
[15] McCulloch. British Empire.
[16] See Table II.
[17] Finlaison, ibid.
[18] Lord Lonsdale said in the House of Lords in 1743 that "the excessive use of gin has hitherto been pretty much confined to London and Westminster". (Quoted by Mrs. George, Economic Journal.)
[19] The difference between the registered Christenings and Burials as shown by the Bills of Mortality for these years is 4,062; allowing for the known greater deficiency in the registration of births as compared with that of deaths, the estimate in the text seems not unreasonable.
[20] George. London Life in the XVIIIth Century. 1925.
[21] White. Observations on the Mortality at York. Trans. R. Soc., 1782.
[22] Howlett. Examination of Dr. Price's Essay. 1781.
[23] Heberden the Younger. College of Physicians. Medical Transactions, Vol. IV, 1813.

CHAPTER IV. Individualism and Laisser-Faire.

[1] Travels in France. Sept. 27th, 1788.
[2] Memoir of John Grey of Dilston. Quoted by Lord Ernle in English Farming Past and Present.
[3] Langford. A Century of Birmingham Life. 1868.

[4] Unwin. Samuel Oldknow and the Arkwrights. 1924. See note infra.
[5] Tammany has proved that a corrupt organization can be efficient along certain lines.
[6] Bell. Plague of London. 1924.

New Towns.

The conditions in the new towns resembled curiously those found in new countries at the present time. We find the same relentless pushfulness, a determination upon the part of the strong to "make good" at all costs and a lack of social ties which tended to an extreme individualism. If it be countered that many of the immigrants had only travelled a few miles and, in any case, only within the circuit of two small islands, we must remember how modern developments have revolutionized our ideas of distance. It was not merely that it took several days to journey from one part of England to another, but that life was extremely local in character. A man tramping a few miles from his home might easily have found his speech scarcely understood, might have gazed amazedly at an unfamiliar type of farming, and found the whole condition of life different owing to a different tradition of administration in parish affairs. Numerous small unfamiliarities, such as those of weights and measures, of superstition and social customs, would have cut him adrift from that body of inherited tradition and order which in a long settled community controls life from the cradle to the grave. In purely rural districts much of this localism survives even in the 20th century; for instance, inhabitants of West Sussex still consider those of East Sussex to be "foreigners". Apart from changes of district, to the country dweller the new town life must have been bewildering in the extreme and again his position was not at all unlike that of the modern Eastern European settler in the U.S.A. Ignorant, illiterate, accustomed to obey in his old home, he normally accepted the conditions which he found in home and factory as part of a natural order. If unemployment or dear food drove him to despair, his sullen resentment only found expression in ill-organized strikes or futile rioting. In periods of normal employment and food prices the immigrant agricultural labourer was probably not dissatisfied; in this again he resembled his modern prototype in the New World. Our views of life are comparative, the immigrants compare their new lot with their old one, not with some unimagined good. The erstwhile agricultural labourer coming into the town found his home in a shoddy, ill-built house without sanitary conveniences and with no water laid on. But he was not used to a well-built house, and the town accommodation, being new, was probably on the whole more comfortable and convenient than the tumble down cottage he had left. As to sanitary conveniences, he had never heard of them, and for the water, very likely his wife was thankful only to have to fetch it from a stack-pipe in the yard instead of having to pump it or to carry it a quarter or half a mile. His work in the factory or workshop was long and laborious but he had always envisaged life as consisting of long and laborious toil. It was, unlike his old work, comparatively well paid, moreover his wife and children could find paid work, too, which they had probably been unable to do in the village. The family therefore could afford better food, more meat in particular, and better clothes. The rural immigrant is not transformed at once into a good citizen, he brings with him rural ideas of hygiene which are disastrous in a town, he is readily a prey to tyranny or the tool of political corruption. It is possible to argue that a true urban democracy is impossible without a town bred population.

CHAPTER V. The Growth of Commerce.

[1] The sextant was not invented until 1761.
[2] In 1735.
[3] Cunningham. Industry and Commerce. 4th ed., 1905.
[4] In 1811 London still contained about $\frac{2}{5}$ of the urban population and the northern towns had grown rapidly in the second half of the 18th century.
[5] Kalm. Visit to England. 1748. Reprinted 1892. Also others.
[6] Grant. Highland Farm. 1924.
[7] Unwin, op. cit.
[8] See note to Chapter VI.
[9] Ashton. Iron and Steel in the Industrial Revolution. 1924.
[10] Apart from coarse cotton spinning.
[11] Ashton, op. cit.
[12] Machinery only became relatively cheap with the development of the machine tool industry in the '20's.
[13] Knowles. Industrial and Commercial Revolutions. 1st ed., 1921.
[14] Ashton, op. cit.
[15] See Table X.
[16] See p. 196.
[17] Enc. Brit. "Sugar".
[18] Pringle. Diseases of the Army. Appendix. 1752.
[19] At any rate in London and the South.

(*a*) Industrial Organization.

The idea that any considerable proportion of the population of this country ever consisted of independent craftsmen is probably fallacious. In the Middle Ages the bulk of the population were peasants in a servile condition, bound by status, not free to change their mode of life or to move from their birth place. The total town population was very small and of that population only a portion were craftsmen. Serving men, porters and petty hucksters formed a large proportion of the population, not to mention the "submerged tenth", among whom begging was the most reputable means of livelihood. Within the guilds, it is true, democracy was found, most workers normally rising to be masters; but entrance to the guilds was generally by patrimony. By the end of the Middle Ages even guild democracy was breaking down, some guilds had developed a definitely employing class within their ranks, with subordinate organizations for the journeymen who could never hope to rise. Other guilds were exclusively composed of employers who gave out work to members of subordinate crafts. From Tudor times onwards, industry, especially the woollen industry, developed outside the corporate towns. To some extent this movement may have been fostered by craftsmen who fled from the guild restrictions, but it was largely a development of the rural peasant industry by a merchant employing class. In the districts conveniently situated for export or the London market, the clothiers gave out work on a large scale to out workers. This organization, which was definitely capitalistic, was thoroughly established in the western woollen industry by the latter part of the 17th century. The workers often had a small holding, and this may have added to their economic stability, though bad harvests and bad trade often went together. On the other hand, the double occupation did not tend to efficiency in either. In Yorkshire even as late as the middle of the 18th century, the peasant sheep farmers worked up their own raw material and sold it to agents in the local markets, but this was exceptional.

It is true that a considerable amount of industry was carried on by independent craftsmen in small towns and villages and also in London

in the poorer trades. But after all, anyone who alleges that the small independent craftsman is extinct has never walked down a modern village street or down the back streets of a large town. The modern "small man" is no doubt mainly occupied with repair work, in which branch modern developments have constantly opened up new fields of small scale enterprise as others have been closed.

(*b*) Apprenticeship.

The assumption that apprenticeship was a democratic system is false. To be apprenticed to a good trade meant high premiums and introductions. The apprentice was generally of the same social status as his master, probably the son of a friend or relative. If the apprentice married the daughter of the house, romance probably played but a small part in this episode; it would often be an arranged affair, especially if the master had no son to carry on the business. There is no reason to suppose that marriages between ambitious young men and the daughters of well to do trade associates ceased with apprenticeship. The marriage of Robert Owen may be cited in support of the contrary view. On the other hand, apprenticeship to poor trades or apprenticeship for labour was often little better than a form of slavery. By it the children of the poor were bound to years of drudgery, often subjected to ill-treatment and prevented from any effort to better themselves until the age of 24. Whatever apprenticeship may have been in the Middle Ages, by the 17th and 18th centuries it had degenerated into a method of preserving close corporations at the one end of the social scale and a method of social oppression at the other. If the new organization destroyed universal apprenticeship it destroyed a system which had largely outlived its usefulness. Apprenticeship survived during the greater part of the 19th century, however, as the normal and useful way of learning certain skilled handicrafts.

(*c*) The Factory and Health.

It is doubtful if the change to factory organization was as harmful from the point of view of health as has been supposed. Indeed it may even have been beneficial. Insanitary and overcrowded though the early factories were, yet they were probably not more so than the homes of the workers. Country workers may have possessed a rough shed at the side of the house which was used as a workshop, but the town handicraftsman and his family generally lived, worked and slept in one room. This may not have been true of the highly skilled aristocracy of labour, such as the fine muslin weavers, but it was true of the low skilled worker whose labour was earliest displaced by machinery. That the work should be carried on away from the home was an obvious advantage from the point of view of health, especially as many of the processes were unhealthy in themselves. Some woollen processes caused unhealthy dust, while cotton needed moisture, and for this reason many of the cotton weavers lived in cellars.[1] The unhealthy appearance and narrow chests of the hand loom weavers was notorious. A French doctor writing about 1815 said that the posture adopted in hand loom weaving led to a flattened thorax and that the abdomen was frequently also compressed, with results highly deleterious to health. He added that woollen weaving was peculiarly unhealthy owing to the heavy looms and to the fine particles of dust and that hand loom weavers were very likely to contract tuberculosis.[2] Francis Place described the hand loom silk weavers of Bethnal Green as "a physically degraded people".[3]

[1] Knowles. Industrial and Commercial Revolutions.
[2] Dr. Jonas of Montjoye, quoted in review in London Medical Repository, 1815.
[3] George. London Life, p. 194.

The first factories were probably dirty and insanitary to a degree which to us would be appalling. In that they resembled the homes of the people, the hospitals, and the workhouses. The more enlightened employers, however, very soon began to try to enforce elementary cleanliness since it was obviously a good business proposition to do so. In Chapter XV the efforts of many Manchester manufacturers are recorded in some detail. The firm of Boulton and Watt, in the face of great difficulty, obtained decency and order in their factory. A notice in the factory stated, "it is for the health, interest and credit of the men, as well as the masters to keep this manufactory clean and decent ".[1] When we consider the kind of people from among whom the early factory workers were drawn, rough peasants with primitive notions of hygiene, or low class town labourers living under conditions which are not found to-day in the worst slum, we can be sure that the enforcement of decent conditions was no easy task. Many masters, no doubt, took the line of least resistance, others were too ignorant to provide, or to wish for, decent conditions. But the best factories were schools, though hard and unsympathetic as most schools of the period, in which the mass of the people learned elementary notions of cleanliness and decency, of punctuality, regularity, and relative sobriety. Every inquiry has revealed the condition of the home worker to be worse than that of the factory worker, but that condition is generally unknown and, even if known, regulation has always proved difficult and often abortive. The publicity of the factory made possible the arousing of the public conscience and the conditions of the factory made regulation possible. Of course the worker lost some independence when he left the home for the factory. Instead of working more or less at his own pace he was subject to " the tyranny of the bell " and to much other petty regulation and tyranny. The divorce of industry from the home also led to a certain break up of family life, though family life cannot have been worth much in one room in a crowded tenement house. But from the point of view of health the coming of the factory was, at any rate for the town worker, probably a change for the better.

CHAPTER VI. AGRICULTURE.

[1] Curtler. Enclosure. 1920, p. 110.
[2] Ibid., p. 138.
[3] Fitzherbert, who has been stated to have been the first writer on agriculture of any distinction after Walter of Henley (in the 13th century) had published his treatise in 1523, but he stood alone.
[4] Curtler. History of English Agriculture. 1909.
[5] " In England the wholesome custom is much in use, that nearly every district lays itself out for something particular in Rural Economy, to cultivate that which will thrive and develop there best, and leaves the rest to other places. . . . Thus their principal occupation in Hertford is *Agriculture. Hop-growing* and *Cherry-tree* cultivation in Kent, sheep farming in another place, cattle breeding in another, etc."
" They thus sell their own ware, and buy what they themselves have not, or they also exchange ware for ware." (Kalm, Visit to England, 1748, p. 205.)
[6] Curtler, op. cit., p. 148.
[7] Howlett. The Influence of Enclosure on Population. 1786.
[8] Ernle, op. cit.
[9] Weber. Growth of Cities. 1898.
[10] McCulloch. British Empire.
[11] Weber, op. cit.

[1] Lord. Capital and Steam Power, 1923.

ENCLOSURE.

Only an extremely detailed study of the records in numerous parishes can enable anyone to have an opinion worth expressing upon this subject, for this much at least is certain, the course of events was very different in different places. In some, strict legal justice was meted out to the commoners, no less and no more and, since many cottagers proved to have no legal claim, legal justice meant receiving nothing. In other places advantage was undoubtedly taken of the ignorance of many of the participants to cheat them of their legal dues, but there are equally undoubted cases of extreme generosity to the poorer commoners. They were sometimes excused all share of the expenses of the enclosure and even those who had no legal claim were given some compensation. Of the numerical proportion between these different types of procedure the present writer does not pretend to be able to judge; but undoubtedly the procedure tended to be more regular and more considerate of the rights of the poor towards the end of the movement than it was at the beginning. The mere fact that the public opinion of the time intervened in favour of the poor commoner points to the previous existence of considerable harshness and injustice. Even if the point of view be accepted that the smaller commoners led shiftless, poverty-stricken lives it by no means follows that they appreciated the change. The old life had been free and had had many intervals of pleasant idleness, and to persons accustomed to it, a life of regular toil under supervision, even if better paid, would have had few attractions. A period of economic re-adjustment is nearly always one of hardship for individuals and however justly and carefully enclosure had been carried out the break up of ancient traditions and immemorial ways of life would have been bound to lead to suffering. Moreover the change took place rapidly mainly owing to the unhealthy stimulus of war, and to the suffering entailed by the changed economic system was added the more terrible ones of the aftermath of war. Until recent years the after effects of the war were underestimated and evils due to it were ascribed to other causes; the present generation with its own bitter knowledge is less apt to make this mistake.

It will be generally agreed that the conversion of the common fields and wastes into severalty was a necessity and in itself a desirable change, but many regret not only the methods by which the change was carried out, but also the final results of the movement. In other words, they regret that the final result was not relatively small peasant farms but large farms upon a capitalistic basis. Undoubtedly the enclosure movement hastened the extinction of the small farmer, the heavy legal expenses of enclosure and the cost of hedging were a heavy drain upon the small freeholder, while improving landlords who enclosed wanted to see their money back and had a natural bias in favour of the large farm. Enclosure, however, was not the only thing tending towards large farms, the new type of farming was easier for the big man to adopt, for it needed capital, knowledge and enterprise. Small freeholders who possessed the two latter qualities often sold their land and so obtained the first requisite, capital, and became large tenant farmers. The war and after war difficulties, in particular fluctuating prices, largely due to currency difficulties, and the burden of the Poor Law, were difficult for the small man to contend against. In fact economic forces were strongly arrayed against the small man and the enclosure movement, in itself due to those same forces, simply hastened his downfall rather than caused it. There is evidence, for instance, that his cattle were in many cases being starved on the commons before enclosure by the excessive number of beasts placed there by the large farmers. There was also the difficulty of winter feed which in the old days, when everybody slaughtered a large proportion of their beasts in the autumn,

had not arisen. If the small man did not adopt the new methods he could not compete with those who did, while if he attempted to adopt them he was often forced to buy winter feed from the large farmers at excessive prices. It must also be remembered that changes in the organization of industry were destroying the by-employments both of the small farmer and the cottager and a good deal of the distress was due to this cause. It is doubtful if small holdings can ever be economic without by-employments. The experience of other countries, with soils and climates a great deal better suited to small scale farming than those of this country, suggests that without by-employments a peasant proprietary can only survive with a considerable amount of State aid, including State fostered co-operation. It is hardly reasonable to blame a government of landowners in a laisser faire and individualistic age for not artificially preserving the small farmer; it is hardly to the point to say that had they done so untold suffering might have been saved and the history of the English countryside might have been happier. It is not given to many to see clearly the results of their actions to the third or fourth generation, their vision quite unclouded by their own interests, and it is doubtful if it has even been given to large groups as opposed to individuals. It was certainly not given to the 18th century squire, who might perhaps be forgiven for thinking that, in the circumstances of the time, the supreme and predominant object of all good citizens was to increase the national food supply. In any great social upheaval it is well-nigh impossible to draw up a balance sheet, the data are so overwhelming in number and so incommensurable in their nature. The enclosure movement was part of a greater whole; given the other economic changes it was bound to follow, though it is arguable that the results might have been mitigated to a greater extent than they were.

A good deal of misapprehension has been caused by the use of the terms large and small farm. The terms are of course only very roughly comparative and any numerical division line is necessarily artificial. The type of farm which tended to disappear during the enclosure movement was what would now be called a small holding, something under 50 acres. But to imagine that these were replaced by great grazing ranches or huge wheat farms is erroneous. Such farms did exist but their number is easily exaggerated, they only predominated either in typical grazing areas or in the reclaimed wastes, for instance in Norfolk and the reclaimed fens of Lincoln. Only men with large capital and intelligence could farm in these difficult districts, only they could afford to pay rents which would compensate the landlord for his heavy outlay. But these farms had not been made by displacing population, they had been made out of the wilderness. The typical farm about the year 1830 seems to have been a mixed farm of anything from 80 to 500 acres with a rough average of about 150 acres. Even at this date a considerable number of "small holdings" survived, especially in some districts.[1]

CHAPTER VII. IMPROVEMENT OF TOWNS.

[1] St. Dunstan's Wardmote. Inquest Register, 1609. (Quoted by W. G. Bell in "The Great Fire of London". 1920.)

[2] Bateman. Diseases of London. 1819.

[3] These particulars of the events in London immediately before and after the Fire are taken from Mr. W. G. Bell's invaluable work (see Note 1), to which readers are referred for further details.

[1] McCulloch. British Empire. Part III, chap. 1.

[4] Heberden (the Younger). Increase and Decrease of Diseases. 1801, p. 77.

[5] Bateman, op. cit., p. 19.

[6] Black. Observations, Medical and Political. 1781, p. 136.

[7] Hutton. A Journey to London. 1785.

[8] Chalmers. Population. 1802.

[9] The Manchester Guide. 1804.

[10] Clayton. Friendly Advice to the Poor. 1755.

[11] Henry. Manchester Literary and Philos. Society. 1786.

[12] The Manchester Guide. 1804.

[13] Liverpool. A General and Descriptive History. 1795. The writer of this book differs entirely from the usual tribe of local historians and guide book writers, from his pages dulness and sycophancy alike are absent.

[14] Liverpool. Report of the Proceedings of Court of Enquiry. 1834.

[15] Touzeau. The Rise and Progress of Liverpool. 1910.

[16] History of Liverpool. 1810.

[17] Touzeau, op. cit.

[18] Court of Enquiry (see note 14), Dr. Duncan's evidence, p. 400.

[19] History of Liverpool 1795, op. cit.

[20] Langford. A Century of Birmingham Life. 1868.

[21] New History of Bristol. 1794.

[22] Blane, quoted by Bisset Hawkins. Elements of Medical Statistics. 1829.

[23] Though it is true that the cheapest brick houses were often appallingly jerry built. See Mrs. George, London Life, p. 74. Liverpool appointed a Building Surveyor (1822) mainly owing to the scandal caused by a row of houses having been blown down in a gale. Touzeau, op. cit., p. 814. However, many of the old wooden houses had been equally insecure.

[24] Bateman. Diseases of London. 1819.

[25] Note in original text.

"This source of damp was general previously to the fire, as we are told by Evelyn, who, in continuation of the lamentation before quoted, says: 'That the building should be composed of such a congestion of misshapen and extravagant houses, that the streets should be so narrow and incommodious, in the very centre and busiest places of intercourse; that there should be so ill and uneasie a form of paving under foot, so troublesome and malicious a disposure of the spouts and gutters, are particulars worthy of reproof and reformation; because it is hereby rendered a labyrinth in its principal passages, and a *continual wet day after the storm is over.*'"

[26] Bateman, op. cit.,

[27] A Frenchwoman once said to the writer, "You English think of *nothing* but sanitation". Most English visitors to France would agree that our neighbours think too little of it, but would also agree that French towns surpass English ones in civic beauty; the two facts are, perhaps, not unconnected.

CHAPTER VIII. WATER SUPPLY AND DRAINAGE.

[1] The Puritan Corporation closed all the City conduits on Sunday and it was a punishable offence to draw water on that day. (Latimer, Annals of Bristol.)

[2] The Chelsea Water Works Company, which was one of the more efficient of the London Companies, paid no dividend for 40 years and its dividend never exceeded 4%. (T. Faulkner, An Historical and Topographical Description of Chelsea, 1829.)

[3] The Chelsea Company erected an atmospheric engine in 1743 and another in 1747. A Boulton and Watt engine was installed in 1778. (Ibid.)
[4] Feltham. Picture of London. 1802.
[5] Ibid. 1821.
[6] Garnett. Water Supply. 1922 (from which many of the above historical details are taken).
[7] Feltham and others.
[8] See Chapter XVI.
[9] Beckmann. Inventions. English Translation. 1797.
[10] Smollett. Humphrey Clinker.
[11] I.e. in 1863. See biography of Bramah by Samuel Smiles, also article in D.N.B.
[12] Report of Meeting of City and Liberty of Westminster Sanitary Association, 1847.
[13] New History of Bristol. 1794.
[14] Feltham, op. cit.
[15] The Westbourne river.
[16] Quoted by Farr.

CHAPTER IX. The 18th Century Doctor and the British Pioneers of Public Health.

[1] Singer, C. and D. Paper at Congrès Inter. des Sc. Méd. 1913.
[2] Glaister. Dr. William Smellie. 1894. The fraud was exposed by Manningham.
[3] Garrison. History of Medicine. 1921.
[4] It is the opinion of a modern medical writer that the life of Louis XIV, who was a gross eater, was prolonged by the drastic bleeding and purging to which he was subjected by his medical advisers. (Doctor Deguéret, Æsculape, Sept., 1924.)
[5] Garrison, op. cit.
[6] D.N.B. and Works.
[7] Creighton incorrectly ascribes this discovery to John Hunter twenty years later.
[8] D.N.B. and Works.
[9] See Chapter XV.
[10] D.N.B. and Works. His collected works were edited by his son.
[11] The Life of Robert Owen by Himself.
[12] Blane. Remarks on Comparative Health of Population. 1822.
[13] See Table.
[14] D.N.B. and Works.
[15] W. Currie. Memoirs of Dr. Currie. 1831. Also D.N.B. Works and other sources.
[16] Blane said that "the surgeon is more regarded by us than by other nations". He was speaking particularly of the Navy.

CHAPTER X. The Hospital and Dispensary Movement.

[1] The following, communicated to me by my colleague, Mr. S. A. Peyton of the University of Reading, illustrate both the care of the parish for the sick and the advance in medical knowledge :—

Extracts from the Parochial Records of Shinfield (Berks) Overseers' Accounts.

1772. "Pd Mary Lane for Nursing and Lodging the Small Pox and Great Pox and Itch £5 18*s.* 6*d.*

1775. "Beer for children with Small Pox.
1802. "James Pither for Inoculating Cripts children 7s."
Vestry Book.

"At a Vestry held . . . in the Church on Tuesday the 2nd (Dec. 1806) . . . for the purpose of taking into consideration the inoculating the poor of the said parish—Resolved—that Mr. Golding, Surgeon, of Reading be consulted by the Churchwardens and Overseers on the subject of inoculating the poor families and that if he is of opinion that inoculation with the cow pox is sufficient preventive against the small pox that he inoculates them forthwith—should he not be of that opinion—then that he inoculates them with small pox."

[2] Account of the Establishment of the County Hospital at Winchester. 1736.
[3] Ferriar. Preface to Medical Histories and Reflections, 2nd ed. 1810.
[4] Willan. Diseases of London. 1801.
[5] See page 198.
[6] Feltham, op. cit. 1802.
[7] Lettsom. Memoirs. 1774.

List of Hospitals and Dispensaries Founded Between 1700 and 1818

General Hospitals

London.	
Westminster	1720
Guy's	1724
St. George's	1733
London	1740
Middlesex	1745
Provinces.	
Cambridge	1719
Bristol	1735
Hants	1736
York County	1740
Exeter	1741
Northampton	1743
Salop	1745
Liverpool	1745
Worcester	1746
Newcastle-upon-Tyne	1751
Manchester	1752
Chester	1755
Gloucestershire	1755
Birmingham	1766
Salisbury	1766
Staffs	1766
Leeds	1767
Lincoln	1769
Oxford County	1770
Norfolk and Norwich	1771
Leicester	1771
Hereford	1776
Lancaster	1781
Hull	1782
Nottingham	1782
Stroud	1790
Durham	1792
Kent	1793
Sunderland	1794
Sheffield	1797
Truro	1799
Bedford	1803
Denbigh	1807
Taunton	1809
Derbyshire Royal Infirmary	1810
Pontefract	1812
Bridgwater (Somerset)	1813
Berwick-on-Trent	1814
Bolton	1814
Peterborough	1814
Alnwick Infirmary	1815
Stoke-on-Trent	1815

London. Special Hospitals.

London Lock Hospital	1746
London Lock Hospital Rescue Home	1787
Cancer Charity of Middlesex Hospital	1792
London Fever Hospital	1802
Royal London Opthalmic Hospital (Moorfields Eye Hospital)	1804
Royal Chest Hospital	1814
Royal Ear Hospital	1816
Royal Waterloo Hospital for Women and Children	1816
Royal Westminster Opthalmic Hospital	1816

Provincial. Special Hospitals.

Bath Royal Mineral	1737
Manchester Hospital for Women and Children	1790
Margate Sea Bathing	1791
Exeter West England Eye Infirmary	1808
Bristol Eye	1810
Bath Eye	1811
Manchester Eye	1815

London Dispensaries.

Infant Poor, Red Lion Sq.	1769
Royal General (Aldersgate)	1770
Westminster General	1774
London	1777
Surrey	1777
Metropolitan	1779
Finsbury	1780
Eastern	1782
Carey Street	1783
Miller (Greenwich)	1783
St. Marylebone General	1785
National Truss Society	1786
New Finsbury. Smithfield	1786
City Bevis Marks	1789
City	1789
Western	1789
Universal. Ratcliffe Highway	1792
Bloomsbury	1801
Rupture Society	1804
City of London Truss Society	1807
St. Pancras	1810
Middlesex	
Ossulston, Bloomsbury	
Royal Universal. Holborn	
James' Soho	

Provincial Dispensaries

Bristol	1775
Liverpool	1777
Newcastle-upon-Tyne.	1777
Carlisle	1782
*Royal Kent	1783
Whitby	1786
*Wakefield	1787
York	1788
Horncastle	1789
*Doncaster	1792
*Stockport	1792
Birmingham General	1793
Plymouth	1798
North Shields	1802
Reading	1802
Wiveliscombe (Somerset)	1804
*Rotherham	1806
*Falmouth	1807
*Halifax	1807
Brighton	1809
*Darlington	1809
*Penzance	1809
*Warrington	1810
Bristol Eye	1812
Clifton	1812
*Newark (Notts)	1813
Hull	1814
*Swansea	1814
Morpeth	1816
*Chelmsford and Essex	1818
*Windsor	1818

* Now a general hospital.

This list is probably very incomplete, especially in regard to dispensaries. (Burdett's Hospitals' Digest; George, London Life, p. 337.)

CHAPTER XI. General Hygiene and Midwifery.

[1] Willughby, Percivall. Observations in Midwifery. Exact date unknown but belongs to middle of 17th century. A reprint was edited by Henry Blenkinsop and published in 1863.

[2] Though apprenticeship was customary in the City of London in the 17th century. "The young midwives at London bee trained seven years first under the old midwives before they bee allowed to practice for themselves." Ibid.

[3] Glaister, op. cit.

[4] The forceps had been a trade secret for many years in a Huguenot family of surgeons named Chamberlen. The knowledge of it became public property between 1720 and 1730.

[5] Glaister, op. cit.

[6] White, Charles. Treatise on the Management of Lying-In Women, 1777.

[7] Mémoire historique et instructif sur l'Hospice de la Maternité. 1808. The italics in the quotation are added.

[8] See page 132. The Maternité in 1808 had only recently been re-founded after its suppression during the Revolution.

[9] See Annual Report of the Chief Medical Officer of the Ministry of Health. 1922.

[10] Davis, Bunnell. Mortality among Children. 1817.

[11] See pp. 30, 210.

[12] Lettsom. Medical Memoirs. 1774.

Provincial Lying-in Charities.

Chester	1798	Oxford	1807
Exeter	1801	York	1788
Hull	1802	Liverpool	1796
		Newcastle-upon-Tyne	1760

CHAPTER XII. Rickets and Scurvy.

[1] H, J. *M.D.* Scelera Aquarum. 1701.

[2] Bateman. Diseases of London. 1819.

[3] Black. Observations, medical, etc. 1781.

[4] Place said, "I remember the time when an immense number of children were bandy legged or bowed in the front . . . observing children of the poorest people . . . I find deformities very rare where they were very common. (Evidence to Select Comm. on Education, 1835 (3) VII, p. 840.

[5] For instance a 17th century accoucheur remarks of one difficult case, "this woman, in her infancy, was afflicted with rickets, which made her go waddling and cringing in her back." The same writer gives a graphic description of acute rickets in a well to do patient. He states that in 1669 he was engaged by a "worthy good loving Gentleman for his wife. She had been afflicted in her infancy with the rickets. Shee had very great swel'd ankle bones, she went waddling and her left leg was shorter than the other, and the middle of her back was much inverted, from the hips to the shoulders. She was of a very low and of a little small stature." It is not surprising to learn that the efforts to relieve this patient were unavailing. (Willughby). Op cit.

[6] See Report on the Present State of Knowledge of Accessory Food Factors (1924). Medical Research Council. This report contains a certain amount of historical material.

[7] Quoted by Bateman.

[8] Quoted by Lind on Scurvy in Appendix.

[9] Op. cit.

[10] Cabanes, Docteur. Les Vieilles Pierres de L'Hôpital Saint-Louis. Æsculape. March, 1923.

[11] Smollett. Travels through France and Italy, Letter XI, Montpelier, 1763.

[12] Pringle. Notes on Capt. Cook's Second Voyage.

[13] Tucker. Four Tracts. 1774. Quoted by Mrs. George, Econ. Journal.

[14] See Report, op. cit.

[15] Homer. The Old Englishman's Letters for the Poor of England. 1758. Quoted by Mrs. George, Econ. Journal.

[16] Blane. Observations on . . . different Diseases. Medical and Chirurgical Society's Transactions. 1813.

[17] Howard. Lazarettos. 1791.

[18] Report, op. cit.
[19] Purchas. Pilgrimes.
[20] The medal was presented by proxy as Cook had already embarked upon his last voyage.
[21] Mahan. The Influence of Sea Power upon the French Revolution and Empire. Vol. I, 1892, p. 71.

CHAPTER XIII. Antiseptics, Segregation, Leprosy and Plague.

[1] Simpson. A Treatise on Plague. 1905.
[2] Muratori. Quoted by Patrick Russell, see infra.
[3] The word antiseptic seems to have been first used in England by a John Pringle, who was writing about the same time as his great namesake. But the great Pringle also wrote on antiseptics, he used the term in the broad sense of anything which delayed putrification and, since he held disease and putrification to be closely allied phenomena, he held that antiseptics were great weapons against disease.
[4] See Frazer. The Golden Bough.
[5] By Fracastor.
[6] See Singer, C. and D. op. cit.
[7] A fomite is a carrier of infection. In modern times the term is applied to infected clothing, etc. In the 18th century it sometimes had this meaning but it was also applied to the hypothetical particles.
[8] Another school of thought believes that syphilis was introduced into Europe from America.
[9] Castellani and Chalmers. Manual of Tropical Medicine. 1919.
[10] Ibid.
[11] London was not reported free of Plague until 1670. The last reported case in the Bills of Mortality was in 1679. (Bell.) There is the possibility, however, that these later cases were not true plague.
[12] Simpson, op. cit.
[13] Bell. Plague of London, op. cit.
[14] For instance Farr and others.
[15] The exact date seems doubtful, 1478 and 1484 are mentioned by different authorities.
[16] Beckmann. History of Inventions transl. by Johnstone. 1797.
[17] Percival, Edward. Practical Observations, etc. 1819.
[18] Black. Observations, medical, etc., op. cit.
[19] Postlethwayt. Dictionary of Commerce. 4th ed. 1774. Article "Turkey".
[20] Howard. Lazarettos.
[21] Russell, Alexander. The Natural History of Aleppo. 1756.
[22] Russell, Patrick. A Treatise of the Plague. 1791.
[23] Black, op. cit.
[24] This is believed by some authorities to be an under-estimate.
[25] Latimer. Annals of Bristol.
[26] Graunt. Bills of Mortality. 1662.
[27] Burnet says of the plague, "It broke the trade of the Nation and swept away about an hundred thousand souls." (History of my Own Times.) It is not clear if the above estimated mortality refers to London or to the whole country; probably the latter.
[28] The incidence of the plague was probably higher in the Middle Ages when there was much movement of population owing to pilgrimages, fairs and journeys to and from manors, and when also there was an absence of any effective quarantine regulations. If the Black Death was pneumonic plague, a highly infectious form of the disease, the contemporary estimates that one-third or one-half of the population died are by no means incredible in the light of modern knowledge.

CHAPTER XIV. Smallpox in the 18th Century.

[1] Report of Commission on Vaccination. 1896. Table 34, p. 642.
[2] Birch, Bills of Mortality. 1759.
[3] Dr. Robert Watt, "An Enquiry into relative mortality in Glasgow, 1813." Watt was a pessimist, he held that though the deaths under two years had been diminished by the reduction of mortality from smallpox this had been counter-balanced by an increase of deaths between 2 and 10, mainly owing to an increase in the amount of and virulence of measles. Watt, like so many early quasi-statistical writers, based his assumptions on the proportionate number of deaths under 10 to the total mortality, forgetting to allow for the decreased mortality. There is no reason to endorse the opinion of Dr. Woolcombe (quoted by Watt) who prophesied that vaccination would not lessen the death rate among children. "Since disease is one of the appointed checks to excessive population and the plan of Providence in the creation of human life requires the termination of the existence of one-third of its creatures before they have attained the age of two years."
[4] Daniel Bernoulli, the mathematician, writing in 1760 estimated that smallpox carried off the $\frac{1}{13}$th to $\frac{1}{14}$th part of each generation.
[5] To Inhabitants of Liverpool upon a General Inoculation. 1781.
[6] Haygarth. An Inquiry how to Prevent Smallpox. Tract. 1785.
[7] Blane. Statements of facts of Vaccination. Med. and Chir. Trans. 1819.
[8] Schultz. Inoculation report presented to Royal Commission of Health. Sweden. 1758.
[9] Plan for General Inoculation Dispensary. 1775.
[10] Gray, B. Kirkman. History of English Philanthropy. 1905.
[11] See his letter to Howard quoted on page 199.
[12] Proceedings of Small-pox Society of Chester. 1785.
[13] Schultz, op. cit.
[14] Garrison, op. cit.
[15] London Medical Repository. Vol. XVIII, 1822, p. 208.
[16] Henry. Manchester Literary and Philos. Society. 1786.
[17] Howlett. Examination of Dr. Price's Essay. 1781. Note on p. 83.
[18] See Commission on Vaccination, op. cit.
[19] Lettsom. Letter upon General Inoculation. 1778.
[20] Milne. Annuities. 1815. Appendix I.
[21] Jenner began to collect his observations in 1778. He performed his first vaccination in 1796 and published his discovery in 1798.
[22] But see p. 190.

CHAPTER XV. The Anti-Typhus Campaign and the Fever-Hospital Movement.

[1] It is true that Fracastor in the 15th century distinguished between typhus and typhoid, but this knowledge was lost. (C. and D. Singer, op. cit.) John Huxham of Devon (1692–1768) was one of the first modern writers to make the distinction.
[2] Castellani and Chalmers, op. cit.

[3] Howard. State of Prisons, 2nd ed. 1780.
[4] Pringle. Diseases of Army.
[5] See Webb. English Prisons under Local Government. 1922.
[6] It was a terrible scourge in Napoleon's armies. In this connection it has been described as "une ombre sur l'éclat des victoires." Æsculape, Sept. 1925.
[7] See p. 147.
[8] Howard. State of Prisons. 2nd. ed., p. 84.
[9] Young. Travels in France. Jan. 18th, 1790.
[10] Place. Principles of Population. 1822, p. 253.
[11] Milne. Annuities. Appendix 1, p. 755.
[12] Darwin, Emma. A Century of Family Letters. The letter in question was written by Emma Allen (born about 1780) to Elizabeth Wedgwood.
[13] Howard. Prisons. 3rd edition, 1784.
[14] If we omit the forgotten work of Fracastor.
[15] Bateman. Contagious Fever. 1818.
[16] Bernard. Society for Bettering the Condition of the Poor. Vol. III, p. 273.
[17] At this date the word "police" retained the wider connotation which still survives on the Continent.
[18] Bernard. Society for Bettering the Condition of the Poor. Vol. I, p. 115.
[19] Strangers' Friend Society.
[20] Ferriar. Medical Histories and Reflections. 2nd ed., 1810–13.
[21] Currie, W. Memoirs of Dr. Currie. Letter 23 ; also p. 340.
[22] Currie, James. Medical Reports. 1798.
[23] History of Liverpool. 1810.
[24] Liverpool Enquiry, op. cit., p. 470.
[25] Currie did not hesitate to use this argument ; he estimated in 1797 that typhus cost the Liverpool ratepayers £2,400 per annum.
[26] Society for Bettering the Condition of the Poor. Vol. IV, p. 121.
[27] History of London House of Recovery. 1817.
[27] Bateman. Diseases of London. 1819.
[29] Percival, Edward. Practical Observations, 1819.
[30] McCulloch's British Empire. Vital Statistics.

CHAPTER XVI. Malaria. General Summary.

[1] See Table.
[2] Cf. figures of infant mortality at Lying-In Hospital, p. 145.
[3] It is possible that part of the apparent decrease was due to better diagnosis. In both periods any wasting disease would be apt to be called consumption, but the misnomers were probably greater in number in the earlier period.
[4] Castellani and Chalmers, op. cit.
[5] Short. Bills of Mortality. 1750, pp. 208, 68, 19, 69.
[6] Bateman. Diseases of London.
[7] Sydenham. Translation. 1848, Vol. I, p. 41 ; Vol. II, p. 9.
[8] James. The Disappearance of Malaria from England. League of Nations. 1925.
[9] Watson. Medical Topography of Stourport. London Medical Repository. 1814.
[10] By Pelletier and Caventon.
[11] A review article in the Edinburgh Medical and Surgical Journal. 1810, p. 338.

[12] Howard. Public Health in Baltimore. 1924.
[13] Lind. Diseases in Hot Climates. 6th ed. 1808. Appendix.
[14] Blane. Remarks on Comparative Health of the Population. Appendix.
[15] Bateman, see p. 82.
[16] Black. Observation, Medical, etc. 1781, p. 171.
[17] Farr. McCulloch's British Empire. Vital Statistics.
[18] See Farr. Vital Statistics. 1885, p. 131.
[19] Newsholme, op. cit., 1st ed.

CHAPTER XVII. The Period 1815–48.

[1] The scope of this study was originally limited to the period 1700–1815, but it seems desirable to say a little, in a broad way, in order to link it with the well-known era of Public Health Reform which began in 1848. The writer, however, does not pretend to have made any detailed study of the period 1815–48, and the ideas put forward are quite tentative. They are for the most part based upon the conclusions of Farr, the leading authority upon vital statistics for this period.
[2] McCulloch. British Empire.
[3] McCulloch. Note on Population in Wealth of Nations, 1863 ed., p. 461.
[4] Newsholme, op. cit., 2nd ed.
[5] These are calculated from the registered deaths and are, therefore, too low. The earlier figure should probably be 20 and the later about 21·5. The average for the period 1838–61 was 22·2 (see op. cit., note 3) but this was after the advent of cholera.
[5] Weber. Growth of Cities, op. cit.
[7] Farr. McCulloch's British Empire.
[8] Castellani and Chalmers, op. cit.
[9] Macnamara. History of Asiatic Cholera. 1876.
[10] Ibid.
[11] See p. 108.
[12] Shaw. Municipal Government in Continental Europe. 1895.
[13] Evidence before Select Committee on Education. Reports and Committees. 1835 (3) VII, p. 838.
[14] See Webb. Local Government.

Note on Population of Ireland.

The population of Ireland had grown during the period 1700 to 1841 no less vigorously than that of Great Britain. The earliest estimate of the population of Ireland is that of Sir William Petty in 1672, which estimate was 1,100,000. It is usually considered tolerably reliable. In 1731 an enquiry was instituted by the House of Lords, and resulted in the estimate of 2,010,221, but this is usually considered an under-statement, a private enquirer having made an estimate of 2,309,106 in 1726. Any estimates of population in Ireland were extremely doubtful, as there were, in effect, no registers of births and deaths, the only registers that were kept being those of baptisms and burials solemnized in the Church of England which were, of course, absolutely valueless, from the point of view of estimating the population of Ireland. Such estimates as were made were based upon estimates of the number of houses, from which the number of inhabitants was deduced by taking the proportion of 6 persons to a house. During the course of the 18th century several estimates of this kind were based upon the hearth tax. In 1754 this estimate was 2·4 million, in 1777 it was 2·7 million, in 1791 4·2 million. Much reliance cannot be placed upon estimates based upon taxation returns, especially in a disaffected country like Ireland. In 1805 Newenham in his "Enquiry into the Population of Ireland" made an estimate of 5·4 million. In 1813 an incomplete

census was taken from which an estimate of slightly under 6 million was made. A nominally complete census was taken in 1821 with a result of 6·8 million, but this census is usually considered to have been a failure and the result consequently unreliable. In 1831 the census gave a result of 7·8 million, but this census was vitiated by the system of paying the enumerators according to the numbers returned and is therefore usually believed to be an over-statement. The census of 1841 was carried out by the constabulary and is believed to be reliable, it gave a population of just over 8 million. Before the next census the Potato Famine had intervened and in 1851 the population was only 6½ million. The natural increase in Ireland was greater than the growth of population for there was a large emigration before 1848 both to England and Scotland and elsewhere. Besides the permanent emigrants there was a constant stream of migrant labourers whose earnings, doubtless, often made it just possible for their family to eke out a living at home.

The growth of population in England was mainly urban but in Ireland it was predominantly rural. In 1821 the estimated town population of Ireland was only 648,421, out of an estimated total of 6·8 million. Up to the middle of the 18th century Ireland was almost entirely a pastoral country. During the 17th century it had suffered severely from civil war and dissension which had checked the growth of population, but during the 18th century there was not only comparative tranquillity but also a considerable transfer from pasture to tillage. The Corn Bounty Acts, 1783–4 (passed under Grattan's Parliament) gave an enormous impetus to this movement. Free Trade in Corn with Great Britain was established in 1806, a further stimulus was given by this and by the high price of corn during the French wars.

The custom of *gavelkind*, or equal inheritance among children, prevailed in Ireland; this led to division and sub-division of farms which the landlords failed to check. Indeed they are said to have favoured it as it gave them additional political power and further possibilities of rack renting. It is interesting to note that customs of equal inheritance in France led to a stationary population and in Ireland to a rapidly increasing one. This difference was no doubt largely due to a difference in land tenure, but the racial factor probably counted for something. The sub-division of land in Ireland was enormously encouraged by the increasing use of the potato, which by the beginning of the 19th century had become the staple food of the people. The potato is a very suitable crop for *petite culture* and subsistence can be obtained from a smaller area than by any other crop grown in Northern Europe. Arthur Young estimated that an acre of potatoes would feed double the number of individuals that could be fed by an acre of wheat. The dangers of crop failure were however very great. Writers on the subject had been pointing out for years before 1848 that the potato was unsatisfactory as a staple article of diet. Firstly it was the cheapest food available and it would be difficult for the people to turn to substitutes in the event of a shortage, secondly it did not keep from year to year nor was it easily transportable, therefore a crop failure would be particularly disastrous. They also pointed out that the potato crop if it failed, did so more completely than a corn crop. This was before the potato disease had introduced a new and terrible menace.

The growth of population in Ireland was ascribed by McCulloch (Farr ?) to the change from pasture to arable and secondly to the cultivation of the potato and the sub-division of the soil. But there were other factors. The Irish are a fertile race with the habit of early marriage, and the Irish women are successful not only in bearing children but in rearing them. The main cause for this is undoubtedly that Ireland is and has always been predominantly rural, and the rate of infant mortality is much more

unfavourably affected by town life than the general rate of mortality. Irish towns at present show a higher infant mortality than English ones, and probably did so in the early 19th century, but poverty and a low sanitary standard do not necessarily lead to a high infant mortality in rural districts though they do in urban ones.[1] Fresh air and sunshine go a long way to counteract other bad conditions in infants and young children. Ireland enjoys a mild climate and, whatever may be said of a diet of milk and potatoes for adults, it is a very good one for young children. Many Irish villages also were sufficiently isolated to escape epidemic scourges.

The 18th century public health campaign in Great Britain was not without its repercussion in Ireland. The three great scourges of Ireland in the beginning of the 19th century were malaria, typhus and tuberculosis. The second was worst in the towns though it seems also to have been endemic in many villages. There was no Poor Law in Ireland until 1839, and it was doubtless because of this that a certain amount of help for the sick poor was given from public funds. By an Act of 1765 the establishment of infirmaries was made possible by a certain amount of assistance from taxation, supplemented by private charity. Under this Act infirmaries were established in every county except Waterford. In 1802 a parliamentary grant was made to the Dublin fever hospital. In that year it was estimated that in Dublin out of a population of 240,000 upwards of 60,000 persons received treatment in the fever hospital of the city. In 1817 another terrible visitation of typhus led to the formation of a General Board of Health. The board estimated that out of a population of 8 millions over one and a half million had suffered from fever and that there had been 65,000 deaths. In 1818 an Act was passed giving additional facilities for the establishment of fever hospitals, and help from the public funds was authorized to the extent of not more than double the private subscriptions. Government loans were also authorized for the creation of buildings and under this Act fever hospitals were erected in various parts of Ireland. In 1805 an Act was passed allowing contributions out of the public funds to dispensaries equal to the amount of private subscriptions. Under this statute over 400 dispensaries were established, relieving half a million patients annually. Some persons even held the view that the sick poor were better cared for in Ireland than in England, as in England the institutions for the relief of sickness only existed in large towns while in Ireland they were spread over the whole face of the country, and guarded by statute. (McCulloch. British Empire, and Note on Population, Wealth of Nations, ed. 1863.)

CHAPTER XVIII. CONCLUSION.

[1] Bateman. Diseases of London. 1819.
[2] Widening and paving streets, etc.
[3] Bissett Hawkins. Medical Statistics. 1829.
[4] "Our medical police are behind those of every other European country." (Roberton, 1827.) Percival says much the same.
[5] Lowe thought that the increase of population in Great Britain was due to "the preservation of the lives of children by vaccination; to the better lodging, the greater cleanliness and sobriety of our lower classes." He adds that, "Similar causes prevail, though in a less degree, on the Continent: in France the increase of population, formerly so slow as hardly to yield an addition of 30 per cent. in a century, may now be

[1] Newsholme, op. cit.

computed at somewhat more than twice that proportion." He thought that the increase in Germany was about the same as that of France, but that that of Russia and the South of Europe was much less. (Lowe, Present State of England. Appendix, p. 69.)

[6] With sturdy insularity he even goes so far as to ascribe the small improvement in Vienna to " overweening paternity " and to " the excessive spirit of regulation, the dread of novelty, the restrictions imposed upon the medical profession ".

[7] Lowe, op. cit.

[8] Howlett. Examination of Dr. Price's Essay.

[9] Blane. Diseases of London. 1813. Reprinted in Dissertations, 1822.

[10] Roberton. Mortality of Children. 1827.

[11] Carlisle. Disorders of Old Age, 2nd ed., 1818, p. 92.

[12] See George, London Life, op. cit.

[13] See Bell, Plague of London, op. cit.

STATISTICAL TABLES

" La civilisation, en rendant plus douce l'existence de l'homme, est parvenue aussi à la rendre plus longue, le développement des lumières a contribué à faire assainir les demeures particulières et l'enceinte des villes, à faire disparâitre peu à peu les terrains marécageux et les causes si fréquentes d'épidémies qui désolaient nos aïeux. Les lumières, en multipliant entre les peuples les relations commerciales, ont aussi rendu moins fréquentes et moins redoutables les famines, dont les chances ont diminué d'une autre part en améliorant la culture des terres et en variant les moyens de subsistance ; les connaissances médicales et d'hygiène publique ont également trouvé des moyens précieux pour combattre la mortalité, tandis que le développment de l'industrie et les garanties que recevait la société par les institutions plus libérales contribuaient à répandre l'aisance et les moyens les plus actifs de conservation " (Quételet).

Quételet was well aware of the prejudicial effects of large towns and manufactures upon public health and was inclined to think that the decrease in mortality had been overestimated, especially in regard to England.

TABLE I

DEATH RATES AT VARIOUS PLACES AT DIFFERENT PERIODS. PER 1,000.

Place.	(*circa*) 1750	1780	1800	1815	1825
England and Wales .	35	28	25	20*	21·5*
France . . .	—	34	—	—	25
Sweden . . .	—	28·5	27	—	20
Holland . . .	43	—	—	—	20
London . . .	52	50	—	29	28
Manchester . .	40	35·5	—	—	—
Liverpool . .	—	—	—	33	25
Birmingham . .	—	—	—	33	23
Portsmouth . .	—	—	35·5	26	—
Paris . . .	40	—	—	—	31
Amsterdam . .	—	37	—	—	41
Vienna . . .	50	50	—	—	45
Berlin . . .	35·5	33	37	—	29
Rome . . .	—	43	—	—	40

* These figures are slightly higher than those given in Bisset Hawkins and others (see note, chap. xvii (5), p. 263).

Nothing can be argued from small differences in the above figures, partly owing to the looseness of the original compilations and partly for the reasons discussed on page 246.

The figures are mostly from Bisset Hawkins, though a few are from other sources. They are not strictly comparable as some are for an average of years and some for a particular year and not necessarily the exact year in the table. The original figures are in many cases only rough estimates, so that the possibility of a slightly increased inaccuracy seemed legitimate in order to gain the clarity of tabular form.

The following mortality rates are given by Bisset Hawkins for about 1825.

	Per 1,000.
Kingdom of Prussia	29
Pays de Vaud	20
Venetian Provinces	35·5
Geneva	23
Lyons, Strassburg, Barcelona	31
Nice	32
Naples (city)	35·5
Leghorn	28·5

TABLE II

Deaths. Per Cent of Living

Between ages of	6 *Towns of England.** 1813–30.	*Glasgow.* 1821–35.	*London.** 1813–30.	*Sweden.* 1755–75.	*England** *& Wales.* 1813–30.	*Carlisle.* 1779–87.
0–5	8·63	8·10	8·27	9·01	4·98	8·23
5–10	1·03	1·24	1·08	1·42	·70	1·02
10–20	·73	·76	·60	·71	·63	·59
20–30	1·39	1·17	1·07	·92	1·02	·75
30–40	1·56	1·57	1·52	1·22	1·17	1·06
40–50	1·96	2·31	2·29	1·74	1·49	1·43
All Ages	2·95	2·83	2·84	2·89	2·12	2·50

* Corrected for deficiencies in registers.

McCulloch,
British Empire.

TABLE III

CARLISLE TABLE

Which shows the Number of Deaths by each Disease that took place in each of the under-mentioned Intervals of Age at Carlisle, during eight years, commencing with 1779, ending 1787, and excepting the year 1780.

Between ages of / and	0 5	5 10	10 15	15 20	20 30	30 40	40 50	50 60	60 70	70 80	80 90	90 up	Total
Febrile Diseases													
Inflammatory Fevers.	3	—	—	—	1	—	—	1	—	—	—	—	5
Nervous Fevers	2	3	1	4	3	9	15	13	7	2	—	—	59
Putrid Fevers	5	4	1	2	8	5	8	4	5	1	—	—	43
Jail Fevers	4	2	1	2	—	2	3	—	—	—	—	—	14
Mortification	—	—	—	—	—	—	—	1	—	1	1	—	3
Sore Throat	3	—	—	—	—	—	—	—	—	—	—	—	3
Stone and Gravel	—	—	—	—	1	—	1	—	6	1	—	—	9
Pleurisy	3	2	1	1	—	1	2	2	5	2	—	—	19
Rheumatism	—	—	—	—	—	—	—	1	3	2	—	—	6
Gout	—	—	—	—	—	—	1	2	—	1	—	—	4
Small Pox	225	8	2	—	3	—	—	—	—	—	—	—	238
Measles	28	2	1	—	—	—	—	—	—	—	—	—	31
Scarlet Fever	31	4	2	1	1	—	—	—	—	—	—	—	39
Thrush	63	2	—	—	—	—	—	—	—	—	—	—	65
Consumption	34	15	10	15	45	34	31	15	15	—	—	—	214
Infantile Remittents.	19	8	—	—	—	—	—	—	—	—	—	—	27
Menorrhagia cochialis	—	—	—	—	—	—	3	—	—	—	—	—	3
Teething	3	—	—	—	—	—	—	—	—	—	—	—	3
Five other diseases	—	—	—	1	1	—	1	1	1	—	—	—	5
Nervous Diseases.													
Apoplexy	—	—	—	1	—	2	5	9	11	4	—	—	32
Palsy	—	—	—	—	—	—	1	5	4	3	1	—	14
Fainting	—	1	—	—	—	1	2	1	—	1	—	—	6
Indigestion	—	—	—	—	—	1	6	5	8	1	—	—	21
Convulsions	10	—	—	—	—	—	—	—	—	—	—	—	10
Epilepsy	—	—	—	1	1	1	—	1	—	—	—	—	4
Asthma	1	—	—	—	—	—	2	9	11	4	—	—	27
Chincough	18	1	—	—	—	—	—	—	—	—	—	—	19
Diarrhœa	7	1	1	1	—	1	2	2	1	2	—	—	18
Four other diseases	—	—	—	1	1	2	—	—	—	1	—	—	5
Diseases of Habit													
Weakness of Infancy.	204	—	—	—	—	—	—	—	—	—	—	—	204
Decay of Age	—	—	—	—	—	—	—	—	26	90	84	26	226
Dropsy	1	1	2	3	3	5	5	7	12	7	2	1	49
Dropsy of Brain	2	2	1	—	—	—	—	—	—	—	—	—	5
Scrophula	—	2	—	—	—	—	—	1	—	—	—	—	3
Venereal	—	—	—	—	1	—	1	—	—	—	—	—	2
Jaundice	3	—	—	—	1	—	5	2	—	2	—	—	13
Local Diseases.													
Cancer	—	—	—	—	—	—	—	1	2	2	—	—	5
Difficult Delivery	—	—	—	—	4	4	1	—	—	—	—	—	9
Seven other diseases	1	—	—	1	—	1	2	1	3	—	—	—	9
Unknown	32	11	5	—	2	8	9	9	31	7	1	—	115
Accidents	7	5	2	4	3	4	2	1	1	—	—	—	29
Total	709	74	30	38	79	81	108	94	152	134	89	27	1615

TABLE IV

RATE OF MORTALITY FROM DIFFERENT DISEASES AS SHOWN BY CARLISLE TABLE

Per 100,000 Living (under 20 per 100,000 omitted)

Nervous Fever	90	Apoplexy	49
Putrid Fever	66	Palsy	21
Jail Fever	21	Asthma	41
Pleurisy	29	Chincough [1]	29
Small Pox	364	Diarrhœa	28
Measles	47	Weakness of Infancy	312
Scarlet Fever	60	Decay of Age	346
Thrush	99	Dropsy	75
Consumption	327	Jaundice	20
Infantile Remittent Fever	41		

TABLE V

IN LONDON

Number of annual deaths per 100,000 living

	1780.	11 *years ending* 1810.	*Decrease by*
Apoplexy	55	49	1/9
Asthma	85	89	*inc.* 1/21
Childbed and Miscarriage	47	32	1/3
Consumption	1120	716	1/3
Dropsy	225	131	2/5
Fevers	621	264	3/5
Measles	48	94	doubled
Small Pox	502	204	3/5

Milne. Life Annuities, vol. ii, chap. xi, xii.

TABLE VI

DEATHS FROM SMALL POX

Sweden

1779	15,000
1784	12,000
1800	12,800
1801	6,000
1822	11
1823	37

Bisset Hawkins.

London

In 6 years ending with	*No. of deaths.*	*Annual average.*
1797	10,973	1,829
1803	9,999	1,667
1809	7,094	1,182
1813	6,466	1,078

Milne, op. cit.

[1] Whooping cough.

TABLE VII

BRITISH NAVY. SICKNESS, MORTALITY, AND DESERTIONS PER 1,000 SEAMEN

Year.	Sent Sick to Hospital.	Deaths.	Desertions.
1779	408	26	14
1782	316	22	10
1794	250	12	7
1804	120	16	2
1813	93	7	·1

Quoted in McCulloch, British Empire, p. 566.

TABLE VIII

MORTALITY IN PRISONS

France	1 in 23	Villermé.
France, galley slaves	1 in 49	Villermé.
Netherlands	1 in 27	Quételet.
King's Bench and Fleet	1 in 50–55	Cooper.
French prisoners of war	1 in 55	

Bisset Hawkins.

TABLE IX

MATERNAL MORTALITY: DEATHS PER 1,000 DELIVERIES

	Place.	Year.	M.	Year.	M.	Year.	M.
(1)	British Lying-in	1749–58	23·8	1779–88	16·6	1799–07	4·6
(2)	Hôtel Dieu	—	—	1780	66·6	1822	33·3
(3)	Paris Maternité	—	—	—	—	1808	43·5
(2)	Berlin Lying-in	—	—	1796–06	31·2	1807–17	22·2
(2)	Stockholm Lying-in	—	—	—	—	1822	33·3
(2)	Dublin Maternity	—	—	—	—	1757–25	11
(2)	Edinburgh Maternity	—	—	—	—	1817	10
	England	1760	(4) 16·6	1781	(5) 15	—	—
(6)	Westminster Dispensary	—	—	1781	3·7	—	—
(2)	Lewes 15 yrs. private practice	—	—	—	—	1828	·8
(2)	Prussia	—	—	—	—	1817	8·8

(7) Cf. England and Wales, 1921, 3·71 per 1,000 births

(1) Report.
(2) Bisset Hawkins.
(3) Mémoire—sur l'Hospice de la Maternité.
(4) Estimate quoted by Short. Bills of Mortality.
(5) Estimate quoted by Black.
(6) Report, Westminster Dispensary. Bland.
(7) Annual Report, Ministry of Health, 1923.

TABLE X

The Growth of Towns

·000 omitted.	‡ 1377	Cir. 1700	C. '20	C. '50	Cir. 1770	Cir. 1780	Cir. 1790	‖ C 1801	C 1811	C 1821	C 1831
London .	35	Es 674	—	Es 676	—	—	—	900	1050	1225	1474
Manchester*	—	—	Es 8	Es 19	* En 27	—	* En 59	81	98	134	183
Liverpool .	—	Es 5	Es 12	Es 20/5	En 34	—	En 56	78	94	119	165
Birmingham	—	—	—	—	44	En 54	—	74	86	107	142
Bristol and Suburbs	9	—	—	Es 43	—	—	—	64	76	87	103
Leeds . .	—	—	—	—	—	—	—	53	62	84	123
Plymouth .	7	—	—	—	—	—	—	43	56	61	75
Portsmouth.	—	—	—	—	—	—	—	32	40	45	50
Norwich .	6	En 29	—	En 36	—	—	En 40	37	37	50	61
Newcastle-on-Tyne	4	—	—	—	—	—	—	28	37	47	50

These towns were the ten largest in England and Wales in 1821.
* Including Salford.
‡ Poll Tax returns, quoted by Lowe.
Es Estimate, based on registers. Very unreliable in case of Liverpool, owing to large numbers of Roman Catholics.
En Enumeration.
C Census.
‖ Census, in some cases corrected.

Milne stated in 1815 that there were 40 towns in England with more than 10,000 inhabitants, containing a total population of 2,140,000. Excluding London, the average population was 28,500.

TABLE XI

Population of France

	Mill.	
1700	19·7	
1784	24·8	
1801	27·3	First reliable census.
1811	29·0	
1821	30·5	
1831	32·6	

There was a great difference of opinion as to the population of France, as of all countries, in the absence of statistics, in the 18th century.

"On peut cependant admettre que le total en était passé de 19 millions vers 1700 à 24½ millions vers 1790." This increase, in spite of wars and civil disorders is ascribed to "Un adoucissement général dans les mœurs, dans les rapports de maître à serviteur, une hygiène mieux comprise, les efforts quotidiens des sciences médicales". (Histoire de la Population Française. Lucien Schöne, 1893, p. 216.)

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