

# SECTION I.

## SANITARY SCIENCE & PREVENTIVE MEDICINE.

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### ADDRESS

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PRESIDENT OF THE SECTION.

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It is desirable that in its brief periodical visits to the principal cities and towns of the country, our Institute should, if possible, leave behind it some abiding and growing influence.

When I was first asked to undertake my present duties, it was my wish to conduce to this end by advocating the establishment in each town visited by the Institute, of some local sanitary association, similar to the one with which I am connected in Manchester, that has now been at work in that city for more than thirty years. If this suggestion were adopted there would then be scattered over the country permanent, and, we may hope, active associations, each of which would carry on the objects of our Institute, and that would prevent our visits from becoming merely a "three days' wonder," and their influence from quickly dying out.

There are probably few places in England that would be so likely as Leicester to benefit from the establishment of such an institution in its midst. From the Registrar-General's last annual return it appears that the mortality in Leicester of infants under five years of age was over 500 per 1000 deaths—more than one-half of the total mortality—and during the month of July the *Sanitary Record*\* notes no fewer than 100 deaths from diarrrhœa, an eminently preventible disease.

Such a fearful mortality as this must be due to something wrong in the place itself. As Mr. Simon remarks:† "Local

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\* Aug., 1885, p. 72.

† Papers relating to the sanitary state of the people of England, 1858, p. 8.

excesses of fatality are due to local circumstances of aggravation," and "these aggravating local circumstances are such as it is fully possible to counteract."

Surely it behoves the inhabitants of this great town to take measures to remove such a reproach to their humanity as soon as possible. One of the best means for this purpose would be, I believe, the formation of an influential voluntary sanitary association.

I should have wished to dwell longer upon this subject, but I have been requested by your chairman, Dr. Alfred Carpenter, to treat more generally upon the subject of disease prevention, and must therefore leave this suggestion for your future consideration.

I am, however, unwilling to abandon the hope of leaving behind me some statement that may have a permanent influence upon the sanitary enterprise of this place, and as a merchant endeavours to sell his wares by offering samples and proofs of their value and efficiency, so I propose now to advocate sanitary measures by giving you a record of a few facts showing the success that has attended their application in the past.

The present time is particularly opportune for a review of this kind.

We are now probably approaching the end of an epoch in sanitary science, and as Dr. Whewell has shown\* no important advance of any science ever takes place with perfectly equable steps. The epochs marked by each such advance have both a "Prelude" and a "Sequel."

At the present time, thanks to the labours of such men as Simon, Pasteur, Lister, and others, we have passed through the greater portion of the first part of the period. The careful researches of these observers have revealed to us such a knowledge of the causes of many epidemics and of some endemic diseases as will enable us to cope successfully with them in the future. But now comes the "sequel" of the epoch, and in this period, whilst we may expect the above discoveries to acquire a more perfect activity and a more complete development, a great part of our work will consist in diffusing our knowledge through a wider throng of the secondary cultivators of the science, and in tracing it into its distant consequences. This, as Dr. Whewell remarks, "is a work always of time and labour, often of difficulty and conflict."

The work of diffusing amongst the community the knowledge that has been gained is especially necessary in the case of sanitary science.

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\* History of the Inductive Sciences, vol. I., p. 10.

The successful application of its principles depends to a great extent upon their willing acceptance by the people. In these times, no law, however good, can work with thorough efficiency in the face of even a small phalanx of mistaken malcontents. We have not to look far for an illustration of this fact, there are abundant indications in this locality of the "difficulty and conflict" characteristic of the period; but it is the special function of the Sanitary Institute to enter into battle with the opposing forces, and one way in which this may be done, and the one most likely to leave permanent results is to build up in the minds of the people a rampart of well-ascertained facts, that will enable them effectually to resist the battery of specious arguments that will be brought against them.

To take another analogy, and one more in harmony with our peaceful office, let us endeavour in this resting period, so to feed men's minds with facts and with the principles drawn from them, that they will be ready hereafter to put in force all the beneficent and health-giving procedures that have been provided for them by the earnest labours of so many generations of single-minded men of science.

I can do little more now than indicate one step that may be taken in this direction by the Agents of our Institute—namely, to insist constantly upon the successful results obtained by sanitary measures in the past.

It is a trite saying that men often fail to realize the blessings of health until they have lost them, but the converse of this proposition is equally true of the popular appreciation of the value of preventive medicine, for in an improved condition of public health, people easily forget the evil times through which their forefathers have passed, and hence they seldom fully realize their own present happiness.

Up to a comparatively recent period it was scarcely possible to appeal to the general rates of mortality of the country for evidence of an improvement in its sanitary condition, as Mrs. Browning says:—

"The world we're come to late, is swollen hard  
With perished generations and their sins:  
The civiliser's spade grinds horribly  
On dead men's bones, and cannot turn up soil  
That's otherwise than fœtid."—*Aurora Leigh*, p. 52.

Thus the death-rate was apparently unchanged from decade to decade, and it was necessary to enter into details to show that some such improvement must have taken place to counter-vail the many other sources of mischief that had been steadily

increasing along with the increasing concentration of the population.\*

These details are by no means less significant at the present time, but within the last ten years a striking change has taken place even in the general death-rates, and whoso runs may read the vindication of sanitary science. A saving of life to the extent of about three-quarters of a million of persons in a decade may now be reckoned up from the pages of the Registrar-General's returns, and, when we examine the figures that he gives, the diminution in certain classes of disease points unmistakably to the influence of measures of preventive medicine.

The following table is taken from the last annual return, and gives a comparison between the ten years 1861-70, and the three years 1881-83, and it shows that the total saving of life from the specified diseases amounts to over 60,000 annually.

The most notable improvement in these figures is in the four diseases: scarlet fever, fevers (mainly typhoid), diarrhœa and phthisis. All these complaints, with the exception of the first, have been found to be distinctly controlled by better drainage and water supply, and it is highly probable, as has been shown by Dr. Alfred Carpenter, that scarlet fever must also be classed amongst these diseases.

DEATH-RATES IN ENGLAND (PER MILLION).

	1861-70.	1881-83.	Differences.	Total Annual Saving.
Small-pox .....	162	68	— 94	2,444
Measles.....	442	369	— 73	1,898
Scarlet Fever .....	972	513	—459	11,934
Fevers.....	885	292	—593	15,418
Diphtheria .....	187	140	— 47	1,222
Cholera .....	108	13	— 95	2,470
Diarrhœa, &c. ....	868	601	—267	6,942
Phthisis .....	2488	1846	—642	16,692
Other Tuberculous Diseases	768	713	— 55	1,170
				60,190

But the case in favour of sanitation becomes still stronger if we take account of its application in special instances.

1. In the Army and Navy.—At one time—namely before the year 1854—no class of our population was apparently so unhealthy as our soldiers and sailors, when its mortality was com-

\* See address on the present position of State Medicine in England: *British Medical Journal*, 1877, p. 214.

pared with that of the ordinary civil population of the country. This fact also was the more remarkable because these men had been selected from amongst these very people for their health and strength, and had all been submitted to a careful medical examination before they were enrolled. In certain army corps also they were drawn for the most part from a class above the lowest ranks of society. Her Majesty's Guards are nearly all of them not only men of the most stalwart proportions, but many of them are of birth and condition above that of the ordinary rank and file of the army, and yet at one time, as you may see from the following Table, these men died at three or four times the rate of the ordinary civil population, many of them succumbing to consumption and others to various forms of fever.

## MORTALITY PER 1,000 OF STRENGTH.

	1830-37.	1837-47.	1863-72.	1874.
Household Cavalry.....	14.5	11.1	9.17	8.79
Cavalry of Line.....	15.3	13.5		
Foot Guards .....	21.6	20.4		
Mediterranean Stations....	21	16.4	11.2	7.27
Canada, &c.....	23	17	9.49	6.0
Jamaica, &c.....	91	59	17.05	16.9
Madras, India .....	52	—	24.22	14.22
Bengal, „ .....	44			
Ceylon.....	49			

Rates of Mortality at the same ages prevailing in healthy country populations .....	7.7
In England and Wales .....	9.2
In Manchester .....	12.4

The report of the Commissioners shows clearly that the chief causes of this fearful mortality were to be found in the unwholesome barracks in which these men had to live: "The dormitories or barrack rooms are very confined, the minimum cubic space allowed to each soldier by regulation being only 450 feet, and in a majority of cases even this minimum is not attained; in a number of barracks there is a deficiency of one-third, and in some instances of more than half of the space allotted by regulation." (P. 17.) "The result is that the soldier sleeps in a foetid and unwholesome atmosphere."

One witness (Sergeant Brown) on being asked as to the state of the air of these rooms replied: "A very thick and nasty state, especially if I came in out of the air. If I went in out of my own room sometimes, I could not bear it till I had ordered

the windows to be opened to make a draught." The conclusion of the commissioners, drawn from all the facts brought before them, was that "the ravages committed in the ranks of the army by pulmonary disease are to be traced, in a great degree, to the vitiated atmosphere generated by overcrowding and deficient ventilation, and the absence of proper sewerage in barracks." (P. 16.)

Shortly after this report was issued measures were taken to remove these defects, and the result is plainly seen in the improvement that has since taken place in the health of the army (see Table)—an improvement so great that, in the Abyssinian campaign, Lord Napier of Magdala was able to conduct it to its close without the loss of a single man from disease; and in the last annual report of the Army Medical Department for 1883, we find that the deaths of soldiers in the United Kingdom were only 6·28 per 1,000, and throughout the world only 9·57 per 1,000.

The improvement in the sanitary condition of the navy is little, if at all, less manifest. We are told by Dr. Guy ("Public Health," p. 162) that "in the year 1779, 70,000 men were voted for the service of the navy; of these 28,592 were sent sick to hospital, and 1658 died. In 1813, out of just twice the number (140,000) 13,071 were sent to hospital, and 977 died. In 1779, therefore, the sick were more than 2 in every 5, and the deaths 1 in every 42; while in 1813, the sick were about 2 in 21, and the deaths 1 in 143, the sickness reduced to a fourth, the deaths to little more than a third! These figures speak for themselves; they are very eloquent."

"Is it possible," he says, "to imagine a more conclusive demonstration than these facts afford of the reality and importance of the science and art of hygiene?"

If it be true, as it undoubtedly is, that by improvements in diet, water supply, and ventilation, in clothing and cleanliness, aided by superior medical treatment, and especially by vaccination, and by an improved discipline, tempered by mental culture and amusement; if it be true that these improvements and reforms have saved life, and prevented sickness to such an extent that the effective force of our navy has been more than doubled, that one ship, for every purpose of navigation and warfare, is at least equal to two of the same size and force, that a vessel can now keep the sea twice or thrice the time that was possible less than a century ago; if it be true that, at the old rate of mortality, all Europe could not have furnished the seamen necessary for our defence and safety during the great revolutionary war; then is it a mere waste of words to argue that health, which is the strength of all who work, is the great

source of power to nations in their peaceful labours as in their warlike struggles?"

I may bring this eloquent account up to date by saying, that in the last report of the health of the navy (for 1883) the death-rate was only 5·88 per 1000 in all, and only 4·05 from disease alone, the lowest record since the commencement of these reports, 28 years ago.

2. Prisons. Let us next inquire as to the past and present of the prisons of the country, and as to the past let Lord Macaulay speak. "In the times of the Stuarts," he says, "the prisons were hells on earth, seminaries of every crime, and of every disease. At the assizes the lean and yellow culprits brought with them from their cells to the dock an atmosphere of stench and pestilence which sometimes avenged them signally on bench, bar, and jury. But on all this misery society looked with profound indifference."

Dr. Guy, in his admirable little work on "Public Health," gives many interesting details respecting the "jail distemper," the Black Assizes at Oxford in 1577, and at Launceston in 1742, when so many persons died, including the Lord Chief Barons, sheriffs, and others, that Macaulay's account is fully justified.

He also describes the state of the prisons, and the fearful condition of their inmates drawn from Howard's statements. It must suffice to say that, "from a public inquiry, it appears that from August 1776 to March 1778, out of 632 prisoners 176 had died," much more than 1 in 4.

Contrast with this state of things the condition of prisoners at the present time. Our prisons are now models of hygienic management, and in the last report of the Medical Inspector it is stated that "the conditions under which the prisoners are placed are such as to maintain their health, and in most cases to improve it."

As Mr. Escott points out\*—"The prisoner's health is carefully tended. He is continually weighed, if he falls away in flesh, or suffers from bodily ailment, he is prescribed for or admitted into hospital. His moral welfare is equally regarded."

The Secretary of State for the Home Department writes in November, 1883 :—"The progressive decrease in the death-rate of the prisons, which has now reached 7·8 per 1,000 of the prison population, is a striking proof of the successful care that has been bestowed on the health of the prisoners." "Considering that the class of persons who are placed under the care of the medical officers are generally those whom vice and crime have rendered

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\* England, its people, polity, and pursuits, p. 251.

unhealthy subjects, this death-rate (even taking into account the number of diseased prisoners released on the score of ill-health), must be regarded as singularly low."

It will be noted that it differs very little from the rate already given of the general civil population of the country between the ages of 21 and 50, and it may be remarked that of the 17,000 prisoners 3,500 are under 21, and 1,700 are over 50.

It may possibly be objected that it is scarcely fair thus to compare the England of the time of Howard the Philanthropist with that of to-day.

The neglect of the prisoners in those times was of a piece with the general neglect of sanitary matters, and was the cause of the fearful mortality. Its diminution then might be supposed to have had little to do with sanitary science properly so called; that the common sense of mankind had amended the evil before the birth of this branch of knowledge, which has only arisen in the course of the present century and most of it within the limits of the reign of our present gracious sovereign. This was not the case, however, for the improvement of prisons took its rise after the passing by the House of Commons in 1774, of an Act for Preventing the Jail Distemper.

"This Sanitary Act," says Dr. Guy, "had many of the properties of sound legislation. It is concise and clear, prescribes what is to be done, insures the requisite publicity, constitutes a body of inspectors (the Justices of the Peace in Quarter Sessions assembled), and provides a summary punishment for the infringement of its own provisions."

3. *Small-pox and Vaccination.*—There is yet another instance of the beneficial operation of a sanitary measure, as to which it is also necessary, happily for us, to travel back into the past, at least as far as the beginning of the present century, before we can fully realise the good that has been derived from it.

I speak now of vaccination, and I am the more impelled to go into some detail upon the subject because I am informed that in this town there are still to be found many persons who doubt the value of the protection it affords, and who stoutly oppose the existing laws on the subject.

It is difficult now-a-days to realize the terrible nature of small-pox. To the civilized and protected classes of society it has almost ceased to be a fatal disease. In the Table which I have given you, it will be seen that only sixty-eight persons per million died of it, and even in the great epidemic of 1871 and 1872, less than 1 in 1,000 many of them unvaccinated persons. But in the times before vaccination, as Mr. Simon tells us, "it often ravaged more fiercely than the most ruthless of human wars." "In every country, probably, its first



invasion has been of this kind, and its recurrences, when far apart, have been of equal malignity. Thus it was that in 1518, following European adventure to the western world, it concurred with fire and sword, and famine and blood-hounds, to complete the depopulation of St. Domingo; thus, that soon afterwards, in Mexico, it even surpassed the cruelties of conquest, suddenly smiting down three and a half millions of population, and leaving none to bury them; thus, that in Brazil, in the year 1563, it extirpated whole races of men; thus, that about the same period, in the single province of Quito (according to De la Condamine), it destroyed upwards of 100,000 Indians; and thus, too it has been in later days that Siberia and Kamschatka have been ravaged; thus, that again and again, till very recent times, the same dreadful pestilence has depopulated Greenland and Iceland. Before the terror of its presence, communities literally dissolved themselves, and the well-known description of the plague at Athens does not convey more dreadful images of human suffering than may be gathered from the writings of those travellers who, even to the latest times, have witnessed the power of natural small-pox against remote, unprotected populations. While such was the small-pox in the less travelled parts of the world, it seems certain that in civilized Europe, with its constant intercourse of towns and countries, the disease was at least as deadly. Its strength, indeed, was differently distributed, not—as in Greenland—twice or thrice in a century, but incessantly, that fatal sickle was in motion, and the harvest counted from day to day. Instead of coming after long absence on masses of population entirely unprotected against the infection, it recurred in each place so frequently that, for the most part, at any given moment, a more or less considerable majority of the inhabitants would have faced the danger before. They would have obtained against its attacks that protective exemption which was generally the good fortune of survivors. But it is a moderate computation, that for every five persons thus, at the price of much past suffering, almost secured against the disease, one at least must have died. The annual ravages of small-pox in Europe alone have been estimated at half a million of lives. M. De la Condamine reckoned that in France a tenth of the deaths were by small-pox; Rosen's estimate of Sweden was to the same effect. For our English experience there exist only imperfect records, but it seems that within the London bills of mortality, small-pox, when not at its worst, averaged a fourteenth of the annual total of deaths; a fourteenth, too, at times when that total, as compared with the population, represented perhaps double our present death-rate."

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"Yet the ravages of small-pox are not half enumerated in the list of the myriads whom it killed." From the earliest to the latest medical records of the disease, there is constant mention of the tax which it levied upon the survivors. "Among those who outlive it" (says De la Condamine) "many either totally or partly lose their sight or hearing; many are left consumptive, weakly, sick, or maimed; many are disfigured for life by horrid scars, and become shocking objects to those who approach them." "It is scarcely needful to say of the disease I have described that it was amongst all civilised nations a constant source of terror," and "perhaps at no previous moment of English history had the horror of small-pox been greater or more fully justified than at the beginning of the last century." Let the same writer (Mr. Simon) tell us of the change produced by the practice of vaccination: "The results are truly conclusive."

Compare for instance, in the case of Sweden, the twenty-eight years before vaccination with forty years soon afterwards;—during the earlier period there used to die of small-pox, out of each million of the Swedish population, 2,050 victims annually; during the latter period, out of each million of population, the small-pox deaths have annually averaged 158."

"Or, compare two periods in Westphalia: during the years 1776-80, the small-pox death-rate was 2,643: during the thirty-five years 1816-50, it was only 114. Or taking together the three lines which belong to Bohemia, Moravia, and Austrian Silesia, you find that where formerly (1777-1806) there died 4,000, there now die 200."

"Or, taking two metropolitan cities, you find that in Copenhagen, for the half century 1751-1800, the small-pox death-rate was 3,128, but for the next half century only 286; and still better in Berlin, where, for twenty-four years preceding the general use of vaccination, the small-pox death-rate had been 3,422, for forty years subsequently it has been only 176."

"In other words, the fatality of small-pox in Copenhagen is but an eleventh of what it was; in Sweden little over a thirteenth; in Berlin and in large parts of Austria, but a twentieth; in Westphalia but a twenty-fifth. In the last named instance, there now die of small-pox but four persons, where formerly there died a hundred."

But we have not yet reached the full extent of the benefit to be derived from vaccination.

After a multitude of operations had been practised it became evident that complete immunity to subsequent attacks of small-pox had not been conferred; either from an insufficient original inoculation with the lymph, or else from a gradual fading away

of its influence, some of the vaccinated persons were found to take the disease, though usually in a modified form.

Since it was in adults, or in persons who had not been vaccinated for a number of years, that this liability to contract small-pox was mostly perceived, it was most probable that the latter explanation was the most usual one, and accordingly the practice of re-vaccinating adults was introduced. In most of the European armies all the recruits were obliged to undergo this operation, with the result that in all of them the mortality from small-pox was still further reduced.

In Germany, after the Franco-German War, when the small-pox epidemic of 1870-71 prevailed, the idea began to be entertained that still better results would have been obtained if the army had not been exposed to the increased intensity of the poison due to a surrounding population only imperfectly protected against its attack.

In this country therefore a still more stringent Vaccination Act was passed in the year 1874, making not only infantile vaccination but re-vaccination compulsory.

According to this law, "every pupil at public or private school must be vaccinated in the twelfth year of life, unless he has had ordinary small-pox within the last five years, according to medical witness, or has been successfully re-vaccinated."

The result of this enforced re-vaccination has been almost to stamp out small-pox altogether. The records of the small-pox mortality in London, Paris and Berlin respectively show that the remarkable and persistent decline of the disease since 1874, can only be due to the new vaccination law—for all other conditions in these towns remain since that date pretty nearly the same as they were before. The mortality from this cause in the general population is now reduced to 2 or 3 per 100,000 persons, and in the German Army not a single death from small-pox has taken place since the year 1874.

In the Austrian and French armies during the same period there is still a large death-rate from this cause.

The following comparison between these armies is given in the report of the German Vaccination Commission,\* published at the commencement of the present year.

At the beginning of the year 1870, the armies of Prussia and Germany, as well as the united populations of these countries, had to go through an epidemic of small-pox. Accurate numerical data are lacking with regard to the French army, but it is certain that its losses also were very considerable. During

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\* The Report of the German Vaccination Commission is printed with the diagrams in the *British Medical Journal*, August 29th, 1885, p. 408.

the year of the war, the Prussian army had by far the fewest losses, although in France the soldiers came frequently into contact with the infected population.

The war in itself, with its hardships and deprivations, could not have increased the mortality from small-pox, for the Austrian army, in the same epidemic, suffered far greater losses from it.

The only difference with regard to the ratio of small-pox in the three armies is, that the French and Austrian army was incompletely re-vaccinated, and also inadequately vaccinated, and therefore found to be more visited by small-pox, while the Prussian army had the advantage of having re-vaccination carefully carried out, and enjoyed the protection which a neighbourhood almost free from small-pox procured for it. The prejudicial influence of a neighbourhood tainted with small-pox, and the relative protection of a neighbourhood free from it, is, however, evident from the Table of the cases in the Prussian army, given in the report referred to.

It must also be noted that re-vaccination had been already practised several times (every tenth year) in the army. Notwithstanding this, cases of small-pox were more numerous in the years 1867 to 1869, and therefore before the time of the inoculation law, than after the year 1874. For this fact there is no other explanation than that, in the same way as small-pox in the army considerably increased in consequence of the close contact with the sick in France, so, formerly, it must have been more frequent in the army, as the civil population had also more sickness from small-pox than at present. It is noteworthy that since the year 1874 no deaths from small-pox have occurred in the Prussian Army, while both the other armies still show by comparison quite a considerable mortality from this disease. No other reason can be given for such an exceedingly striking difference between the prevalence of small-pox in the three armies than the working of a strictly-carried out inoculation and re-vaccination.

I commend these facts to the attention of the anti-vaccinators of Leicester and other places, only expressing my fear that those who fail to be convinced by them are inaccessible to any argument whatever.

4. Consumption.—I have already called your attention to the remarkable reduction in the number of deaths from consumption. Hitherto this disease has not usually been classed amongst those that can be prevented by sanitary measures; it has been supposed to be mainly a matter of nutrition and of circumstances beyond the control of local authorities; but Dr. Buchanan has demonstrated the enormous ameliorating influence of drainage upon this disease. It appeared to me that it might be desirable

to ascertain what was the limit of its preventibility. I had noticed that the disease was comparatively infrequent in the place in which I myself live, and it occurred to me that I might ascertain how many cases originated in the different parts of the locality. A great portion of it is composed of deep porous soil, but it is surrounded by boulder-clay, the result of glacial drift, and a great part of Bowdon, and parts of Dunham and Altrincham, are built upon a thick bed of sand, in many places over 100 feet in thickness. The climate is thus rendered temperate and the air and soil dry. After the wettest weather the paths speedily become dry, and the basement story of a house is often as dry as its attic. It has the further advantage that it is virgin soil. The sand is as pure and free from organic matter as in the days when it was deposited by ice floes, or was silted up by the estuary of the Mersey. No house is ever built upon freshly made ground, or on pits that have been filled up with refuse. The locality is also well sewered and has a plentiful supply of good water. Moreover, the inhabitants are for the most part well-to-do people. Out of 2,559 of population at the last census, only about 500 are poor, and live on the low-lying clay lands that surround the sandy downs upon which Bowdon is built. The remainder dwell in well-built, salubrious houses, they are well fed and comfortable in their circumstances.

It will thus be seen that such a community are in a position peculiarly well fitted to preserve them from attacks of tubercular disease. I was, however, hardly prepared for the result of my inquiries.

I obtained from the superintendent registrar of deaths an extract from the death register of all the deaths from diseases of the lungs occurring in Bowdon in the ten years 1875-84.

Of these 22 were from phthisis, but 11 of them took place in the low-lying clay lands before mentioned, and 9 of the remainder were found to have contracted the disease before coming to Bowdon. This leaves two to be accounted for, and one of these was a gentleman connected with the city mission in Manchester, who was therefore constantly obliged to attend crowded evening meetings in different parts of the town. The other was a merchant's clerk, who went to town at 8 every morning, and did not return until 7 p.m. None of the female population, who are more constantly in the place, contracted the disease there.

Such a record as this is a strong testimony to the truth of the observations made by Drs. Bowditch and Buchanan, as to the influence of a well drained porous soil upon the disease, and it holds out to us the hope that when further attention is paid to this point, a large part of the terrible mortality that still

takes place from this disease may be prevented, and that consumption may cease to be as it has been called 'the scourge of the English people.'

I have now passed in review the success that has attended sanitary effort in diminishing the general mortality of the country, especially that from such diseases as scarlet and other fevers, from small-pox, and from consumption. I have also shown its influence in the special cases of the mortality in the army and navy, and in our prisons.

We are still far from having reached the full extent of the benefits that may be derived from it, but we may hope by its means to bring somewhat nearer the time promised by Isaiah to those who obey God's laws, when "There shall be no more thence an infant of days, nor an old man that hath not filled his days, for the child shall die an hundred years old."—*Isaiah*, c. lxx., v. 20.

*On "Infantile Diarrhœa," by Dr. W. E. BUCK.*

THIS question of Infantile Diarrhœa appeals to us especially in Leicester, as this town has been for a long series of years notorious for the excessive mortality from this cause. In dealing with this subject, I propose firstly to point out the peculiarities of the death-rate from this source, as shown by the quarterly reports of the Registrar-General; secondly, to take the positive facts; thirdly, to deal with the negative facts; fourthly, to bring before you a theory that I have long held, together with such corroborative evidence as I have obtained; and lastly, to add a few words on the pathology of what I venture to call specific diarrhœa.

The first point to be noticed in the quarterly report is that the deaths from diarrhœa are taken and multiplied by four, so as to make an annual rate per 1,000 for the third or summer quarter; this is usually known as the diarrhœa rate. According to these tables during ten years, 1874-83, Leicester is at the head of the list with 7.1, being followed by Preston 6.4, and Hull 5.0; while at the end are Bristol 1.7, Huddersfield 1.6, and Halifax 0.9. These are all commercial and manufacturing towns, and yet they constantly occupy the same relative positions in the diarrhœal rate.