

[Report 1903] / Medical Officer of Health, Essex County Council.

Contributors

Essex (England). County Council.

Publication/Creation

1903

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1904.

SUMMARY OF THE REPORTS
OF THE
DISTRICT MEDICAL OFFICERS OF HEALTH
IN THE
ADMINISTRATIVE COUNTY OF ESSEX,
For the Year 1903.

PREPARED FOR THE COUNTY COUNCIL
BY
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Chelmsford :
PRINTED BY JOHN DUTTON, 8, TINDAL STREET.

PREFACE.

It is a matter for regret that the summary of the annual reports of the local Medical Officers of Health cannot be issued earlier, but this appears to be quite impossible under present conditions. Some of the reports are not received before June and until all have been received the statistics for the whole county cannot be prepared.

The present report deals much more fully than usual with these statistics, and the calculations involved in obtaining corrected death and birth rates have been most laborious, but the results have justified the labour expended. They shew that Essex is an exceedingly salubrious county, whether we base our opinions upon the death-rate from all causes, or upon that from phthisis, cancer, or zymotic diseases.

In this report also especial attention has been given to the description of the sewage works in the county. I find that deputations are constantly going outside the county to see works of certain character, when good illustrations could be seen within a few miles. It is often worse than useless going to see experimental works, it being far better to visit works at which all the sewage of a district is being treated. Where only a portion is being treated, the amount can be carefully regulated so that no excess is received at any time, whereas in actual practice the works must be capable of treating a flow up to three or more times the normal amount. It is too often forgotten, also, that the most skilfully devised works will not give satisfactory results unless properly supervised. At present there exist in the county excellent examples of all the most modern systems of sewage treatment, and I am compelled to say that none of them give as good results as a well managed sewage farm such as the one at Romford.

I have to thank the Surveyors of the various districts for the valuable information given me, and all the Medical Officers of Health for their unfailing courtesy and assistance in all matters relating to the well being of the County.

JOHN C. THRESH.

August 4th, 1904.

TABLE OF CONTENTS.

SECTION I.

	PAGE.
Population	7
Birth-rate	7
Death-rate	10
Corrected Death-rate	13
Infantile Mortality	17
Deaths from the seven principal Zymotic Diseases	19
Zymotic Death-rate	20
Corrected Birth-rate	20
District Birth-rates, Death-rates, etc.	25
Death-rate from Cancer	28
Death-rate from Tuberculosis	32

SECTION II.

Prevalence of Infectious Diseases	34
Table shewing distribution throughout the County	37
Smallpox	39
Scarlet Fever	43
Diphtheria and Membranous Croup	48
Typhoid and Allied Fevers	56
Measles and Whooping Cough	64
Diarrhœa	67
Isolation Hospitals and the extent to which they are utilized	67
Charts shewing cases of and deaths from various infectious diseases each year from 1891 to 1903	68
Meteorology and prevalence of Disease	71
Monthly rainfall in various districts	72
Table giving Meteorological Data and number of cases of each infectious disease notified in each month	73

SECTION III.

Sanitary Administration	74
Systems of Sewage Disposal	74
Factories and Workshops	121
Slaughterhouses and Bakehouses... ..	121
Table of analyses of various sewage effluents	122

	PAGE.
Cowsheds, Dairies and Milkshops ...	123
Chief improvements effected and further improvements required ...	124
Summary of work done in the County Public Health Laboratory ...	129
Summary of reports of Inspectors of Nuisances ...	130

APPENDIX.


Annual Reports, Summaries of
 PORT SANITARY AUTHORITIES, HARWICH, COLCHESTER, & MALDON—i.
 URBAN SANITARY DISTRICTS.

Barking ...	iii.	Ilford ...	xxviii.
Braintree ...	vi.	Leigh ...	xxxi.
Brentwood ...	vii.	Leyton ...	xxxiii.
Brightlingsea ...	ix.	Loughton ...	xxxv.
Buckhurst Hill... x.		Maldon ...	xxxvi.
Burnham ...	xi.	Romford ...	xxxviii.
Clacton ...	xii.	Saffron Walden ...	xxxix.
Chelmsford ...	xiv.	Shoeburyness ...	xl.
Chingford ...	xvi.	Southend ...	xli.
Colchester ...	xvii.	Waltham Holy Cross	xl.
East Ham ...	xix.	Walthamstow ...	xlvi.
Epping ...	xxii.	Wanstead ...	l.
Frinton ...	xxiii.	Witham ...	li.
Grays ...	xxiv.	Woodford ...	lii.
Halstead ...	xxvi.	Walton ...	liii.
Harwich ...	xxvii.	Wivenhoe ...	liv.

RURAL SANITARY DISTRICTS—

Belchamp ...	lvi.	Lexden & Winstree	lxix.
Billericay ...	lvii.	Maldon ...	lxxi.
Braintree ...	lix.	Ongar ...	lxxiii.
Bumpstead ...	lx.	Orsett ...	lxxv.
Chelmsford ...	lxii.	Rochford ...	lxvii.
Dunmow ...	lxiv.	Romford ...	lxxviii.
Epping ...	lxvi.	Saffron Walden ...	lxxix.
Halstead, No. 1	lxvii.	Stansted ...	lxxx.
„ No. 2	lxviii.	Tendring ...	lxxxii.

Summary of Tables I. and IV. of the Local Government Board.



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SECTION I.

POPULATION.

According to the estimates of the Medical Officers of Health, the population at the middle of the year was

In the 32 Urban Districts	...	637,989
In the 18 Rural Districts	...	243,842
<hr/>		
Total	...	881,831

On the assumption that the population is increasing at the same rate as during the last intercensal period, the number of persons living in the Administrative County in the middle of the year 1903 would be 882,519, a very close approximation to the above total. The following statistics are based upon the population estimates of the Medical Officers of Health.

TABLE I.

BIRTH-RATES PER 1,000 POPULATION.

	1903.	1902.	Mean 1890-1901.
Urban Districts... ..	30·0	28·3	30·8
Rural Districts	25·1	23·9	25·6
Administrative County ...	28·6	27·0	28·7
England and Wales	28·4	28·6	29·8

During the year 19,158 births were registered in the Urban Districts, and 6,125 in the Rural Districts. These figures give rates which are considerably higher in both cases than those recorded for 1902, which were, however, the lowest on record. They are both lower than the rates for 1901 as well as the average rates for the years 1890-1901. Consequently the tendency towards a decrease in the birth-rate, to which attention has been drawn in previous Annual Reports, may

still be traced, though its manifestation is less marked in 1903 than in 1902. The same tendency is manifested in much greater degree by the figures for the country at large. This can be seen by reference to Table I., which shows that the decline from the average for 1890-1901 is only $\cdot 1$ in the case of Essex as against $1\cdot 4$ for England and Wales. The birth-rate for the County in 1903, $28\cdot 6$, is $\cdot 2$ greater than that for England and Wales. This rate for the country at large is lower than any previously recorded; and although the decline has been less during the last four years than previously, the continuous character of the decrease is strikingly shown by the fact that of the 27 years which have elapsed since 1876 (when the birth-rate was $36\cdot 3$, the highest figure ever recorded for England and Wales) only six have not shown a birth-rate lower than that of the preceding year. This tendency to decrease, which has been attracting much attention of late years, is by no means confined to England, but is manifested in greater or less degree by most civilised nations, and especially by those of Anglo-Saxon origin.

It follows from what has been said that the relative birth-rate position of Essex has improved, since it is now slightly above that of the country at large, instead of being, as in the average of recent years, considerably below it. It will be convenient, however, to defer the further discussion of this subject until the methods have been described by which these "crude" rates may be modified, with a view to rendering them more truly comparable.

The total deaths in the County (including 207 in the County Lunatic Asylum) numbered 10,504, of which 7,343 occurred in the Urban and 3,161 in the Rural Districts. The excess of births over deaths is, therefore, 14,779. As the birth-rate is $2\frac{1}{2}$ times the death-rate the natural increase in population is very great. Figure I. represents graphically the natural increase, or excess of birth-rate over death-rate, in Essex, England and Wales, and certain other European countries. It will be seen that during the ten years 1891-1900 the death-rate

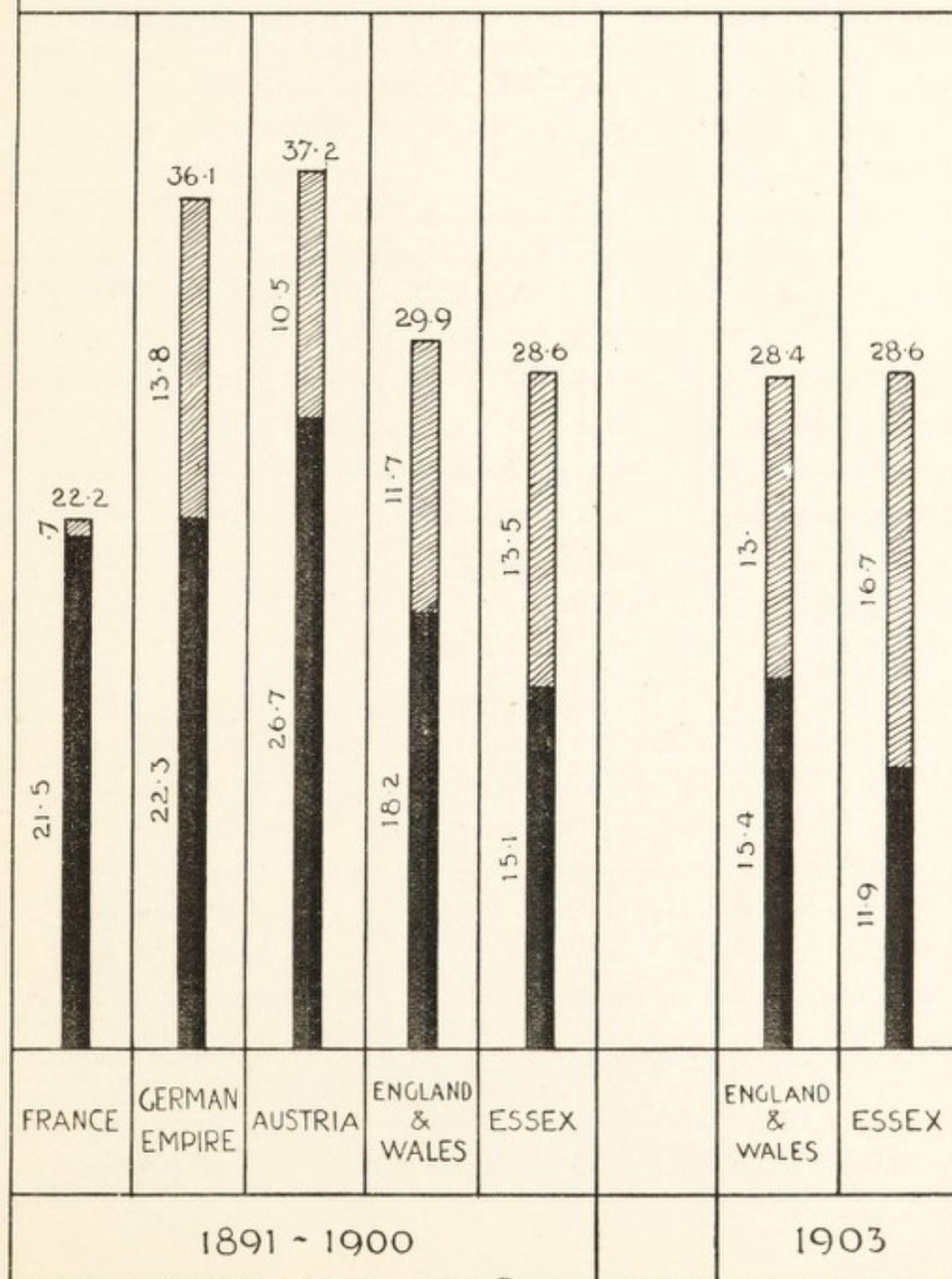
Fig. 1

Showing mean Birth-rates, Death-rates, and rates of natural increase 1891 - 1900, and for the year 1903.

Black portion = Death-rate.

Shaded portion = Rate of Natural Increase.

Black plus shaded portion Birth-rate.



of England and Wales was much lower than those of France, Germany, or Austria, but that the natural increase was greater in Germany, owing to the much higher birth-rate prevailing in that country. Although the birth-rate in Essex was lower by 1·3 per 1,000 than that of England and Wales, the natural increase was much greater (13·5 against 11·7) and only slightly inferior to that of Germany, owing to the fact that the Essex death-rate was lower than that of England and Wales by no less than 3·1 per 1,000. When we turn to the consideration of

TABLE II.

DEATH-RATES PER 1,000 POPULATION.

	1903.		1902.		Mean 1890-1901.	
	Crude.	Corrected	Crude.	Corrected	Crude.	Corrected
Urban Districts... ..	11·5	11·9	12·0	12·4	14·9	15·4
Rural Districts	13·0	11·2	14·3	12·3	15·2	13·1
Administrative County	11·9	11·6	12·6	12·3	15·0	14·7
England and Wales ...	15·4	15·4	16·3	16·3	18·2	18·2

the figures for 1903 the comparison instituted becomes even more favourable to Essex. The natural increase for the year is 16·7, and by comparison with the other columns of the diagram it can be seen what a remarkably high figure this is. It exceeds that for England and Wales by no less than 3·7, the difference being almost entirely due to the advantage held by Essex in respect of death-rates. The County death-rate for the year is, indeed, phenomenally low. Last year's rate, 12·6, was lower than any previously recorded, but during 1903 a further fall occurred, to 11·9. The death-rate for England and Wales for 1903 is also considerably lower than any previously recorded. Thus the fall in the birth-rate is just at present

being more than compensated for by the fall in the death-rate, but it is not to be expected that this compensation will be maintained in the same degree, should birth-rates continue to fall. A falling birth-rate diminishes the proportion of young children in the population, and by doing so tends to lower the death-rate, since the deaths of children under five years of age form a very large proportion, sometimes as much as 50 per cent., of the total deaths. This effect of a diminishing birth-rate is illustrated by the corrected death-rates which the Registrar-General has found it necessary to publish in his last Annual Report (for 1901). These show that had the age-constitution of the population in 1880 and previous years been the same as in 1901 the death-rates for those years would have been about 1 per 1,000 less than those actually recorded. The age-constitution of the population of England and Wales is now, accordingly, more favourable to a low death-rate than it was then, and some of the fall in the death-rate which has occurred is thus accounted for. But if the low birth-rates now prevailing continue, as they seem likely to do, the probability is that the age-constitution of the population will once more become less favourable than at present to a low death-rate, for the following reason. At present, as compared with 1881, since when the fall in the birth-rate has chiefly occurred, the proportion of children under five, who die more rapidly than the total population, has diminished, and that of young and middle-aged adults, who die less rapidly than the total population, has increased; hence the present favourable age-constitution. But unless the birth-rate increases again the proportion of persons aged 55 and upwards, who die more rapidly than the average population, should also increase as compared with 1881, and by doing so render the age-constitution less favourable than at present. As yet this increase has not taken place to any extent, but when it does, it must tend to cause an increase in our death-rates.

But, apart altogether from the question of age-constitution, it may well be questioned how long, given a continuance of the

fall in the birth-rate, equilibrium can continue to be maintained by a falling death-rate. Comparing 1891-1900 with 1871-80 in the case of England and Wales, a fall of 5·5 per 1,000 in the birth-rate has only been met by a fall of 3·2 in the death-rate, or, using the corrected death-rates, 2·3. If the birth-rates were also corrected for age-constitution the fall in them would be increased, since the population now contains a larger proportion of persons of child-bearing ages than it did in 1871-80.

Now the death-rate cannot continue to fall indefinitely, and so maintain even the very imperfect compensation illustrated in the above figures. The benefits of sanitary progress appear so far to have been reaped almost entirely by the junior members of the community. Our young people have an increased prospect of life as compared with their predecessors, but not our old men and women. Consequently all we can look for is to be enabled to secure for a larger proportion of children than at present survival to ripe years; when these have been attained the natural processes of decay will continue to assert themselves, and corresponding with the natural age of death when all preventable premature deaths have been put a stop to, a natural limit to the fall in the death-rates must be reached. It is doubtful whether a lower *average* rate than that recorded in Essex for the past year, 11·6 (corrected), can ever be looked for under any improvement of conditions which we can imagine at present. Lower records may continue to be made from time to time in years of exceptional healthiness, but the average will long continue higher than this very remarkable figure.

Looking at the figures from another point of view, there is no doubt that they demonstrate once more the very healthy character of the County. The "corrected" death-rate, the method of obtaining which is described below, must be made use of for this purpose. It shows an advantage over England and Wales of no less than 3·8 per 1,000. Last year the difference was 4·0 per 1,000, and for the twelve years 1890-1901 3·5 per 1,000.

The use of "corrected" death-rates also enables a fair comparison to be instituted for the first time between the mortalities of the Urban and Rural Districts. The uncorrected death-rates have for years past been higher in the Rural than in the Urban Districts, and in my report for 1900 the surmise was hazarded that this was probably due to the difference in age-constitution of the two populations. This has proved to be correct, as a glance at Table II. will show. All the crude death-rates are higher in the Rural Districts, but the corrected death-rates are uniformly higher in the Urban Districts.

CORRECTED DEATH-RATES.

The method of obtaining these corrected rates may now be shortly described. It is that employed by the Registrar-General for the purpose of rendering comparable the death-rates of populations differing in age and sex constitution. The number of deaths is calculated which would have occurred amongst the population in question had its members died at the rates obtaining in England and Wales during 1891-1900 for persons of the same age and sex. From this figure a death-rate is calculated which is necessarily higher than that of England and Wales if the constitution of the population in question is favourable to a higher death-rate, and lower if favourable to a lower death-rate, than that of the country at large, and in corresponding proportion. Hence this "standard death-rate," as it is called, is a measure of the relation of the age and sex constitution of the population under consideration to that of the population of England and Wales, with which it is being compared. If the standard death-rate is higher than that of England and Wales, and the constitution of the population therefore unfavourable, the crude death-rate is next diminished in the same proportion as that by which the standard death-rate obtained exceeds that of England and Wales, or *vice versa*. The rate so obtained is the "corrected death-rate." It represents what the death-rate of England and Wales would be if the inhabitants died at the rates prevailing amongst the population in question for persons of similar age

and sex. Hence all corrected death-rates are comparable with the death-rate of England and Wales, and consequently with each other. In the case of Essex the standard death-rate was found to be 18·63. This being higher than the death-rate of England and Wales during 1891-1900 (18·2) the crude death-rates for the County have to be diminished in corresponding proportion, that is to say, multiplied by the fraction $\frac{18\cdot2}{18\cdot63}$ or ·9769. This fraction is therefore termed the "factor for correction" for

TABLE III.

NUMBER OF MALES AND FEMALES AT DIFFERENT AGES
PER 1,000 POPULATION. CENSUS, 1901.

		0-5.	5-10.	10-15.	15-20.	20-25.	25-35.	35-45.	45-55.	55-65.	65-75.	75 on.
England and Wales	Males ...	57	54	51	50	45	77	59	43	28	15	6
	Females ...	57	54	51	50	51	85	63	46	32	18	8
County of Essex	Males ...	61	59	56	50	41	75	61	41	26	15	7
	Females...	61	59	55	47	43	81	63	43	29	18	9
Urban Districts	Males ...	63	60	56	49	42	78	61	38	22	11	5
	Females...	63	60	56	50	46	86	65	41	26	15	7
Rural Districts	Males ...	56	58	56	52	38	67	61	45	37	24	12
	Females..	56	57	54	39	35	68	60	48	37	26	14
Ilford	Males ...	57	53	44	38	39	88	69	38	21	11	3
	Females...	60	55	55	57	49	101	71	41	27	17	6
East Ham	Males ...	76	66	59	44	39	86	65	37	17	7	2
	Females...	73	65	56	44	41	89	64	36	20	10	4
Chelmsford Urban	Males ...	51	49	54	51	55	76	57	40	26	18	10
	Females...	54	51	48	48	48	81	63	48	37	23	12
Urban Districts other than Ilford, East Ham, & Chelmsford	Males ...	61	60	57	51	43	75	60	39	23	12	5
	Females...	61	59	56	51	47	84	63	43	27	16	7

the County. The crude death-rate, when multiplied by the factor for correction, yields the corrected death-rate. Factors for correction have been calculated in this manner for the Administrative County, the Urban Districts, the Rural Districts, and a number of the more important individual

Sanitary Districts. The labour involved in these calculations has been considerable, but fortunately the occasion for undertaking it will not recur until the publication of the results of the 1911 Census.

Table III. has been prepared to illustrate the differences of age and sex constitution, which render necessary the calculation of corrected death-rates.

In each case the numbers are per 1,000 of total population. Thus in East Ham, a working-class London suburb with a high birth-rate, there are 76 male and 73 female children per 1,000 inhabitants, in contrast with 57 and 60 in Ilford, a suburb with a moderate birth-rate, and 51 and 54 in Chelmsford, a "country" town increasing but slowly in population.

The great preponderance of persons of advanced age in the Rural Districts is especially noticeable, and explains why the crude death-rates unfairly exaggerate the mortality of these districts. It is obvious that with so many old people there must be many deaths, no matter how healthy the conditions.

Table IV. gives the standard death rate, factor for correction, crude death-rate, corrected death-rate, and comparative mortality figure for the County, the whole of the Urban and the whole of the Rural Districts, ten of the principal individual Urban and two Rural Districts, and for the remaining Urban and remaining Rural Districts respectively. By "comparative mortality figure" is meant a value assigned to the corrected death-rate of each district or combination of districts in comparison with that of the whole County, to which the value of 1,000 is assigned. Thus Ilford, having a smaller corrected death-rate than that of the County, is given a comparative mortality figure which is less than 1,000 in the same proportion, and similarly all figures less than 1,000 denote a corrected mortality below, and all figures above 1,000, above, the County average. If the mortality of England and Wales, instead of that of the County, had been adopted as the standard of comparison, even Barking would have had a comparative mortality figure of less than 1,000.

This table enables us to measure much more accurately than has hitherto been possible the relative healthiness of the different districts and classes of district forming the County. It will be noted that the arrangement is "in order of merit," the lowest corrected death-rate and comparative mortality figure heading the list.

TABLE IV.

RECORDED AND CORRECTED DEATH-RATES PER 1,000 PERSONS
LIVING IN THE ADMINISTRATIVE COUNTY AND IN
SELECTED DISTRICTS.

	Standard Death-rate.	Correction Factor.	Crude Death-rate.	Corrected Death-rate.	Comparative Mortality Figure.
Administrative County ...	18.63	.9769	11.9	11.6	1000
Ilford ...	16.87	1.0790	10.0	10.8	931
Rural Districts, excluding } Orsett and Romford }	21.42	.8497	12.9	11.0	948
Romford Urban ...	19.27	.9445	11.7	11.1	957
Rural Districts ...	21.17	.8597	13.0	11.2	966
Smaller Urban Districts ...	18.47	.9854	11.4	11.2	966
Chelmsford Urban ...	19.53	.9333	12.0	11.2	966
Leyton ...	17.69	1.0294	10.9	11.2	966
Walthamstow ...	17.20	1.0587	11.0	11.6	1000
Urban Districts ...	17.56	1.0364	11.5	11.9	1026
East Ham ...	17.06	1.0674	11.5	12.3	1060
Orsett ...	18.51	.9831	12.8	12.6	1086
Grays Thurrock ...	15.61	1.1662	10.9	12.7	1095
Southend-on-Sea ...	17.07	1.0662	11.9	12.7	1095
Romford Rural ...	18.46	.9662	13.2	13.0	1121
Colchester ...	17.16	1.0606	12.7	13.5	1164
Barking ...	17.17	1.0600	14.3	15.2	1310

The two Rural Districts, Orsett and Romford, which have received separate treatment, were selected for it owing to the fact that they are less purely agricultural than the remaining Rural Districts. As was to be expected, their mortality figures are higher than that of the remaining Rural Districts, which show the lowest figure on the list, with the one exception of Ilford. Thus what has already been said as to the real, as contrasted with the apparent, comparative healthiness of the Rural Districts receives effective confirmation from the table.

Orsett and Romford on the other hand are lower on the list than was to be expected, being both considerably below the average figure of merit for the County. This seems the more remarkable in contrast with the comparatively high position of the smaller Urban Districts, with which they would seem to have much in common. These latter might well have been expected to occupy a lower position in the list. Overcrowding prevails in many of them, a disadvantage of town life which in too many instances is not counterbalanced in the same degree as in the larger centres by the provision of good sewerage and a pure water supply.

If this position is maintained in future years we must draw the inference that overcrowding, apparently as objectionable, is not attended with the same degree of real danger to life in small towns as in large, probably owing to the fact that escape from it into the surrounding country is so much more easy. This would be in accordance with the fact, often pointed out, that the indoor portion of the life of the agricultural labourer and his family is lived under conditions of overcrowding frequently as extreme as any to be met with in cities, but that they remain an exceptionally healthy class, owing no doubt to the large portion of each day spent in pure air.

TABLE V.
DEATHS OF INFANTS PER 1,000 BIRTHS.

	1903.	1902.	Mean 1890-1901.
Urban Districts	106	114	140
Rural Districts	87	93·5	106
Administrative County ..	101	109	129
England and Wales ...	132	133	153

The number of deaths recorded of infants under one year of age was 2,559, of which 2,025 occurred in the Urban, and

534 in the Rural Districts. These figures yield rates very much below the average, the nearest approach to them since 1889 being in 1894 and 1902, in both of which years the County rate was 109, as against 101 for 1903. This exceptionally low rate, like the general death-rate, indicates that the conditions of the past year have been exceptionally healthy, and as in the case of the general death-rate, it would be rash to assume that the improvement so manifested is likely to be maintained.

As pointed out in many of the Medical Officers of Health's Reports the rainfall during the year was abnormally high, and the summer exceptionally wet and cool. This circumstance no doubt had the effect attributed to it of lessening mortality by its cleansing influence, and especially of lessening the mortality of infants from diarrhœa. The diarrhœa mortality for the year is less than half the average.

Being its most variable factor, the diarrhœa mortality largely determines the infantile death-rate in any year, and an exceptionally low diarrhœa mortality having been experienced, probably owing to the cool summer, it is only to be expected that the infantile mortality should be low also.

The recent experience of Essex points to the intimate relationship existing between the weather conditions of the summer and both the diarrhœa and infantile mortalities. Of the last eleven years (those for which the records are readily available), with one exception only, all in which the mean August temperature was below the average experienced a diarrhœa mortality below the average also, and *vice versa*. When comparison is made with the Infantile mortality, the correspondence with temperature is naturally less marked, but still sufficiently striking, occurring as it does in eight out of the eleven instances. The inverse relationship of both mortalities to rainfall is also very marked.

Until checked by the two cool summers of 1902 and 1903, the infantile and diarrhœa mortalities have lately shown a tendency to increase. That this was due in the main to the hot and dry summers met with is sufficiently demonstrated by

the facts already pointed out, and by the great and sudden fall which occurred in 1902, and has been well maintained in 1903, but it may be worth while to draw attention to the fact that if all other conditions remained identical from year to year there would still be an increase in both the mortalities under consideration owing to the increase in the proportion of the population living in the towns. See Tables V. and VII. for the greater incidence of both mortalities on the Urban than the Rural populations.

The experience of this County with regard to Infantile Mortality corresponds exactly with that of England and Wales, there being in both a slight tendency to increase throughout the past decade, followed by a sudden drop in 1902 and 1903. The 1903 rate for England and Wales is the lowest on record, with the single exception of 1881 (a wet summer) when it was 130.

TABLE VI.

DEATHS FROM THE SEVEN PRINCIPAL ZYMOTIC DISEASES.

	Urban Districts.	Rural Districts.	Total.
Small-pox	8	4	12
Measles	182	20	202
Scarlet Fever	44	11	55
Whooping Cough ...	213	53	266
Diphtheria & Diph. Croup	113	35	148
Typhoid & Allied Fevers	78	24	102
Epidemic Diarrhœa ...	256	35	291
Totals	894	182	1076

The number of deaths from the principal zymotic disease is practically the same as last year, and far below the average, especially in the case of Scarlet Fever, Typhoid Fever, and Epidemic Diarrhœa.

TABLE VII.

DEATH-RATES PER 1,000 POPULATION FROM EACH OF THE
SEVEN PRINCIPAL ZYMOTIC DISEASES, 1903.

	Smallpox.	Measles.	Scarlet Fever.	Whooping Cough.	Diphtheria.	Fevers.	Diarrhoea.	Totals
Urban Districts ...	·013	·285	·068	·334	·177	·122	·401	1·40
Rural Districts ...	·016	·082	·045	·217	·144	·098	·144	·75
Administrative County	·014	·229	·062	·302	·168	·116	·330	1·22
England and Wales ...	·02	·27	·12	·27	·18	·10	·50	1·46
Administrative County, Mean for 13 years, 1890-1902.	·020	·102	·372	·282	·284	·335	·661	2·06

The above table shows an exceedingly low zymotic death-rate—the lowest on record—for the County and for both Urban and Rural Districts. The rates for all three were very low last year, but this year has witnessed a further decrease. This is due entirely to the passing of the Small-pox epidemic, but for which the 1903 rates would have been higher than those for 1902. For this the considerable increase of mortality from Measles in the Urban Districts last year is largely accountable. None of the other diseases give rates greatly in excess of those of 1902, and, as well as Small-pox, Diphtheria and Fevers show a considerable decline. With the exception of Small-pox all the infectious diseases caused a relatively smaller number of deaths in the Rural Districts than in the towns.

In Tables X. and XI. are recorded the birth-rates, infantile mortality, and death-rates from all causes, from the zymotic diseases, and from Phthisis, in each of the sanitary districts in the County.

Birth-rates. These are, like death-rates, greatly affected by the age and sex distribution of the populations concerned.

The larger the proportion of women of child-bearing ages (say 15—45) in any community the greater the birth-rate, other things being equal; and, therefore, a population containing a small proportion of such women being to that extent handicapped as to its birth-rate, requires to have its crude recorded rate increased in proportion, in order to secure comparability, and *vice versa*. Table VIII. embodies the application of this method to certain selected birth-rates. The proportion of females at these ages per 1,000 of the total census population being ascertained, the crude birth-rate figure is increased where

TABLE VIII.

	Total Population 1901 Census.	Females aged 15-45, 1901 Census.	Females aged 15-45 per 1,000 population.	Crude Birth-rate, 1908.	Birth-rate corrected for age and sex only.
England and Wales' ...	32,527,843	8,120,847	250	28·4	28·4
County of Essex ...	816,640	190,431	233	28·6	30·7
Essex Urban Districts ...	575,864	141,600	246	30·0	30·5
„ Rural Districts ...	240,776	48,831	203	25·1	30·9
Ilford ...	41,234	11,472	278	30·7	27·6
East Ham ...	96,018	22,831	233	34·4	35·1
Chelmsford Urban ...	12,580	3,018	240	25·2	26·2
Urban Districts other than Ilford, East Ham, Chelmsford, and Waltham-tow. }	95,131	22,474	236	33·3	35·1

this proportion is less than in the case of the population of England and Wales, which is taken as the standard, and diminished where greater, in a degree proportional to the difference from the standard. Thus it is assumed that if the proportion of these women in the Rural District population were 250 instead of 203 per 1,000, the birth-rate would be increased in equal degree, from 25·1 to 30·9.

But the birth-rate is affected, not only by the age and

sex constitution, but also by the condition as to marriage, of the populations concerned. The proportion of married women aged 15—45 may differ greatly from the proportion of all women at these ages, and it is by the former that the birth-rate is chiefly influenced. For this reason Table IX. has been prepared in addition to Table VIII. The method of correction in it is the same as in the other, with the exception that the corrections depend, not upon the proportion of females, but of married females, per 1,000 population. Additional columns are inserted in order to furnish birth-rates per 1,000 married women of 15-45, since this is the usual method of statement. The females at these ages in 1903 are estimated on the assumption that they have increased in the same proportion as the total population, and from the figures so obtained, and the number of births, the rates in column 3 are obtained, which are better, perhaps, spoken of as fecundity rates than as birth-rates.

It will be seen that the "corrected birth-rates" in column 7 bear the same proportion to each other as do the "fecundity rates" in column 3. Hence the comparison between the different populations may be made equally well by either set of figures. The "corrected birth-rate" figures are, however, to be preferred as conveying the same meaning clothed in a more familiar garb, since a conception of the average normal birth-rate is wide-spread, which cannot be said of the fecundity rate.

In the preparation of Table IX. one slight source of error was unavoidable in the absence of statistics as to the number of illegitimate births. These, as well as the legitimate births, are credited to the married women, and in comparing districts, especially with high illegitimate birth-rates, this fact would cause a slight error in favour of the district which had the smaller proportion of married women. In other words, the birth-rate per married woman is overstated to a certain extent, and the greater the number of illegitimate births in proportion to married women (of 15-45) the greater the over-statement. In

Essex, however, the illegitimate birth-rate is lower than that of any other county in the kingdom, being 2·9 per cent. of total births in the years 1891-1900, and 2·6 in 1901. This is in itself cause for congratulation, and reduces to a minimum the disturbing effect of the error in question. Had the necessary returns been available it would have been possible to calculate corrected legitimate birth-rates in accordance with the relative proportions of married, and illegitimate birth-rates in accordance with those of unmarried women, so obtaining rates in all cases absolutely comparable.

TABLE IX.

	Married females aged 1. 15-45 at Census, 1901.	Estimated number of married females 2. aged 15-45 in 1903.	Birth-rate per 1,000 married females aged 3. 15-45 (Fecundity Rate)	Married females aged 15-45 per cent. of all 4. females of same age.	Married females aged 15-45 per 1,000 of total 5. population.	6. Crude Birth-rate.	Birth-rate fully cor- rected (in accordance with proportion of 7. married females aged 15-45 per 1,000 of total population).
England & Wales	3,803,942	3,903,402	243	47	117	28·4	28·4
Essex County ...	98,140	105,974	239	52	120	28·6	27·9
Urban Districts	73,694	81,553	235	52	128	30·0	27·4
Rural Districts ...	24,446	24,824	247	50	102	25·1	28·8
East Ham ...	14,166	16,258	234	62	148	34·4	27·2
Walthamstow ...	13,260	14,815	239	59	139	33·3	28·3

The reason for retaining Table VIII. as well as the more fully corrected Table IX. is that both methods of correction are believed to have their uses, and much can be learned as to the populations in question by comparing the results of the two methods. If one population has a higher birth-rate than another merely because a larger proportion of its women are married, it is from one point of view entitled to be credited with the higher figure so resulting in a comparison of birth-rates. The two corrections, for age and sex constitution and for condition as to marriage, are not wholly analogous. A

population unfavourably constituted in the former respect is unavoidably handicapped in regard to birth-rate, but if the marriage condition is the cause of unfavourable constitution, the low birth-rate may be said to that extent to be the result of human volition. If the ladies of Kensington do not choose to marry so young as the ladies of Whitechapel, it is only fair, from our present point of view, that the Kensington corrected birth-rate should suffer. In the tables East Ham is a case in point. In Table VIII. its corrected birth-rate is 36.1, but in Table IX. only 27.2, that of England and Wales being 28.4 in each case. The reason is that in 1901 in East Ham 52 per cent. of women aged 15-45 were married, and only 47 per cent. in England and Wales.

The discrepancy between the results of the two methods of correction tends to disappear where the populations compared are of similar social status. Thus comparing the rural with the urban districts of England and Wales the percentage of the married is 47 in each case, and in Essex 50 in the rural and 52 in the urban districts. But where there is marked difference in social status the greater average age at marriage of women in the higher social ranks, and the greater proportion of (single) domestic servants in well-to-do communities, tend to reduce the more fully corrected rates of Table IX., but of course do not affect those of Table VIII.

We are now in a position to resume the consideration of the birth-rates of the County, and its Urban and Rural Districts. It will be seen that all are increased by the correction for age and sex only in Table VIII., that the Rural rate is increased in much greater degree and becomes higher than the Urban, and that all of these corrected rates exceed that of England and Wales. These results are due to the facts that the proportion of women aged 15-45 is much greater in the Urban than in the Rural Districts, but is slightly less even in the Urban than in England and Wales.

When, however, the correction for condition as to marriage is introduced, in Table IX., all three rates are reduced below

BIRTH-RATES AND DEATH-RATES.

TABLE X.

	URBAN DISTRICTS.	Birth-rate.	Infantile Mortality	Death-rates from			Medical Officers of Health.
				All causes. (nett)	Seven principal Zymotic Diseases	Phthisis.	
1	Barking	34.2	113.2	14.3	3.24	0.92	C. F. Fenton, L.R.C.P., M.R.C.S.
2	Brantree	22.1	76.3	12.8	0.4*	1.1*	Percy R. Stevens, L.R.C.P., M.R.C.S.
3	Brentwood	18.7	84.9	9.5	0.7	1.06	S. Frazer, L.R.C.P., L.R.C.S.
4	Brightlingsea	24.1	107.1	13.4	0.65	0.65	E. P. Dickinson, M.B., C.M.
5	Buckhurst Hill	22.6	88.5	8.8	1.8	—	W. H. Gimblett, M.D.
6	Burnham	27.8	78.6	11.6	0.94	0.94	C. F. Downman, M.R.C.S., L.R.C.P.
7	Chelmsford	25.2	97.9	12.0	1.5	0.8	H. W. Newton, M.R.C.S., D.P.H.
8	Chingford	23.0	87.0	9.2	—	0.8	Geo. F. Fulcher, M.B., C.L.M.
9	Clacton	21.2	98.8	13.5†	0.9*	1.6*	J. W. Cook, M.D.
10	Colchester	26.0	125.4	12.7	0.9	0.9	Wm G. Savage, M.D., D.P.H.
11	East Ham	34.4	113.0	11.5	1.6	0.9	A. W. Beaumont, M.D.
12	Epping	19.1	133.3	8.9	0.8	0.8	Trevor Fowler, L.R.C.P. & S.I., D.P.H.
13	Frinton	22.5	167	3.2	0.8	—	H. W. Godfrey, M.D., M.R.C.S.
14	Grays	34.2	95.2	10.9	1.4	1.2	J. A. Ward, M.R.C.S., L.R.C.P., L.S.A.
15	Halstead	23.8	144.8	18.7	1.3*	1.5*	C. Gordon Roberts, M.A., M.B., B.C.
16	Harwich	30.4	85.7	9.5	0.2*	0.8*	H. Gurney, M.R.C.S., L.R.C.P.
17	Ilford	30.7	92.6	10.0	1.3	0.7	C. F. Stovin, M.A., D.P.H.
18	Leigh-on-Sea	27.3	63.1	9.8	0.5	1.2	W. D. Watson, M.R.C.S., L.R.C.P.
19	Leyton	32.1	98.4	10.9	1.6	1.0	A. F. Peskett, M.R.C.S.
20	Loughton	25.6	85.9	8.4	1.0	0.4	A. Butler Harris, M.A., M.B., B.Ch. Oxon.
21	Maldon	28.0	76.4	13.2	0.34	0.34	H. Reynolds Brown, M.D.
22	Romford	29.4	99.1	11.7	0.2	1.1*	A. Wright, M.D.
23	Safron Walden	18.4	74.1	12.3	—	0.34	W. Arnistead, M.B.
24	Shoeburyness	40.5	92.5	10.3	0.94	0.23	E. W. Walter, M.B.
25	Southend-on-Sea	25.1	118.7	11.9	1.04	0.88	J. T. C. Nash, M.D., D.P.H.
26	Waltham Holy Cross	27.8	97.3	11.0	1.05	0.45	J. J. Damer-Priest, M.R.C.S., D.P.H.
27	Walthamstow	33.26	113.4	11.08	1.81	0.92	J. J. Clarke, L.R.C.P.I.
28	Walton-on-the-Naze	26.2	55.6	12.1	0.5*	1.5*	J. W. Cook, M.D.
29	Wanstead	18.9	89.8	11.9	1.5*	1.2*	F. Argles, M.R.C.P.Ed., M.R.C.S.
30	Witham	20.9	54.8	11.15	0.3	0.6	K. C. Gimson, M.B.
31	Wivenhoe	18.4	43.5	10.0	0.4	0.8	G. Pender-Smith, L.S.A.
32	Woodford	27.0	108.0	10.9	1.1	0.76	W. G. Groves, M.R.C.S.

*Deaths registered in the district, uncorrected.

†Corrected for deaths of visitors.

BIRTH-RATES AND DEATH-RATES.
TABLE XI.

	RURAL DISTRICTS.	Birth-rate.	Infantile Mortality	Death-rates from			Medical Officers of Health.
				All causes.	Seven principal Zymotic Diseases.	Phthisis.	
1	Belchamp	19.6	115.8	14.4	0.21	0.41	J. Sinclair Holden, M.D.
2	Billericay	25.5	62.0	13.0	0.39	0.39	Fred Carter, M.D.
3	Braintree	20.05	82.6	12.8	0.44	1.27	L. P. Black, M.A., M.B., B.C., D.P.H.
4	Bumpstead	27.1	44.8	13.3	1.42	0.40	Wm. Armistead, M.B., F.C.S.
5	Chelmsford	24.3	93.0	13.2	0.71	1.00	John C. Thresh, M.D., D.Sc., D.P.H.
6	Dunmow	23.6	76.3	15.0	0.45	0.97	Edmund E. Goodbody, M.D.
7	Epping	24.2	100.3	11.0	0.94	0.39	Trevor Fowler, L.R.C.P. & S.I., D.P.H.
8	Halstead No. 1.	22.36	107.6	12.5	0.66	—	J. Henry Ashworth, M.D.
9	Halstead No. 2.	25.1	35.0	11.2	—	1.05	J. B. Bromley, M.R.C.S.
10	Lexden and Winstree	23.7	86.8	12.3	0.6*	1.1*	J. W. Cook, M.D.
11	Maldon	24.5	69.6	12.4	0.55	0.75	John C. Thresh, M.D., D.Sc., D.P.H.
12	Ongar	24.4	122.4	13.4	1.09	0.99	J. C. Quennell, M.R.C.S.
13	Orsett	33.3	122.7	12.8	1.33	0.66	Rea Corbett, M.R.C.S.
14	Rochford	26.8	77.3	12.2	0.9*	2.0*	F. Dorrell Grayson, M.R.C.S.
15	Romford	31.1	109.1	13.2	1.65	1.15	Alfred Wright, M.D.
16	Saffron Walden	22.0	70.0	15.1	0.19	0.58	Wm. Armistead, M.B., F.C.S.
17	Stansted	24.4	77.4	13.07	0.29	0.73	R. A. Dunn, M.D., D.Hy., D.P.H.
18	Tendring	24.9	61.2	11.4	0.7*	0.6*	J. W. Cook, M.D.

*Deaths registered in the district, uncorrected.

the Table VIII. figures, and the County and Urban rates fall below that of England and Wales, the explanation being supplied by column 4, which shows that the proportion of women at these ages married is considerably larger in Essex than in England and Wales. By either method, then, the Rural exceeds both the Urban and the England and Wales rates, a fact which admirably illustrates the utility of such corrected birth-rates, the crude Rural rate being so low as 25·1. With this result we may compare the reversal of death-rate position shown in Table II., where a difference of 1·5 in the crude rates in favour of the Urban Districts becomes converted into a difference of ·7 in favour of the Rural.

Turning to the birth-rates of individual districts, the most remarkable, that of East Ham, has been already referred to. The presence of a large proportion of married women results in a very high birth-rate so far as the population as a whole is concerned, but the result per individual married woman is a little below the average.

The results for Walthamstow are strikingly similar, though somewhat less pronounced. Here again the crude birth-rate and that in Table VIII. are high, but owing to the large proportion of women married the fully corrected rate in Table IX. is below the average for the country. It is probable that if the same tests were applied to similar populations yielding high birth-rates it would generally be found that the latter were due more to the large proportion of women married than to the fertility of the individual wives in such working-class populations.

In the case of Ilford and Chelmsford, the other two districts included in Table VIII., it is unfortunately impossible to obtain from the Census Report the necessary statistics as to married condition.

Amongst the Rural Districts the only two crude birth-rates over 30 are furnished by Orsett and Romford (see p. 25).

Infantile Mortality.—As previously remarked, this has been exceptionally low, and no individual district even has furnished a really high rate. The highest rate occurred at

Halstead, which last year came second on the list. It is worth noting that East Ham, Walthamstow and Barking all have a rate of 113. The two former are the towns whose almost equal birth-rates have just been shown to depend on closely similar conditions, and Barking may be added to the group as having the same birth rate (about 34) probably dependent on the same conditions.

In the rural districts Orsett, as last year, heads the list. Romford, the other rural district coupled with it on p. 16 as being of similar and less purely rural type, also has, as usual, a rate well above the average for the rural districts. The high birth-rates and death-rates of both districts are susceptible of a similar explanation.

Death-rates from all causes.—Halstead Urban, as last year, furnishes the highest death-rate, and next to it come Dunmow, Belchamp and Barking, but the Halstead rate is the only one in the county above that of England and Wales. There are as usual several very low rates recorded in the smaller districts. These are not of much moment, as great variations are frequent in such districts. The case of Ilford, however, is on a different footing. With a crude death-rate of 10, it heads the list of corrected death-rates in Table IV., and last year its death-rate was even lower, 9.3, or, corrected, 10.

Death-rates from the seven principal zymotic diseases.—Only one excessive rate is recorded, that for Barking, 3.2. No other district furnishes a rate higher than 1.8. The rates for the districts around Barking, broadly speaking, rank next to the Barking rate itself.

CANCER.

Last year the continuous and universal increase in the recorded Cancer death-rate was commented upon, and the geographical distribution of the disease in the County was studied. This year my attention has been more particularly directed to the investigation of the relative frequency of the disease, real as well as apparent, in Essex as compared with

the country at large, and in our urban and rural communities respectively. Table XII. shows that the recorded (crude or uncorrected) death-rate in Essex is, and has been of recent years, considerably below that of England and Wales. This has been the case ever since the period 1871-80, when the rates were approximately equal. The urban rate is still further below, but the rural rate is above, that of England and Wales. The difference between the urban and the rural rates is surprisingly great, the latter in 1902 being more than twice the former, and almost twice in 1903. This excess is chiefly, but not entirely, due to the difference in age-constitution of the

TABLE XII.

Death-rate per 1,000 Population.

	1903.		1902.		1901.		1900.	
	Crude.	Corrected.	Crude.	Corrected.	Crude.	Corrected.	Crude.	Corrected.
Urban Districts ...	·575	·666	·518	·600	·594	·688	·555	·643
Rural Districts ...	1·009	·778	1·104	·851	·935	·721	·923	·711
Administrative County	·695	·697	·684	·671	·693	·698	·663	·663
England and Wales ...	...	...	...	...	·843	·843	·828	·828

respective populations. Reference to Table III. will show how much larger is the proportion of persons of mature and advanced years in the rural population, and, the incidence of Cancer being almost exclusively upon such persons, it is only to be expected that the older population should have the higher death-rate. This is the rule throughout the country, and the Registrar General tells us that the death-rates as recorded exaggerate the true prevalence in the rural counties generally, and understate it in the urban, for the same reason as in Essex.

In view of the enormous difference between the recorded urban and rural rates it is most desirable to correct them in such a way that a fair comparison may be instituted. This

correction has usually been carried out by ascertaining the death-rates which would have resulted for the population of England and Wales if its members had died at the rates prevailing for the corresponding ages in the communities to be compared. Death-rates thus obtained are of course comparable since the population yielding them is the same in every case. In the present instance, however, this method is not available, as the ages of the Cancer deaths are not known and consequently we cannot ascertain the death-rates prevailing at the different ages. Under these circumstances the method described on p. 13 has been used. Standard death-rates for urban and rural districts respectively have been calculated on the assumption that their inhabitants of different ages (and sexes) died at the rates prevailing for those ages in England and Wales during the years 1896-1900. By this means we obtain a measure of the degree to which the two populations are inherently susceptible to Cancer. The urban is a young population, and being therefore relatively insusceptible to Cancer, its standard death-rate is only $\cdot 6909$ as compared with $\cdot 8002$ for England and Wales; while the rural, being an old, and therefore relatively susceptible population, has a standard rate of $1\cdot 0380$. The resulting correction factors are $1\cdot 1582$ for the urban and $\cdot 7708$ for the rural districts. When the crude rates have been corrected by means of these factors the great excess in the rural over the urban rates becomes comparatively small in 1903, $\cdot 778$ as against $\cdot 666$.

The difference, however, if greatly reduced, remains considerable, and would probably be somewhat greater than it is if all the rural cases dying in hospitals in urban districts were apportioned to the rural districts to which they belong. It is of much interest, especially in contrast with the facts relating to infectious diseases, which are naturally much more prevalent in the towns, where the opportunities for infection are so much greater (see Table XVII). The figures in Table XII. are utterly insufficient to form the foundation of any conclusions, but the accumulation of such data, as of all other facts relating

to the possible causation of the disease, is a matter of much importance. The desirability of inquiry into all such facts was mentioned in last year's Report, but few of the local reports refer to the matter, that for Southend being an exception.

The effect of correction upon the rate for the whole County is very slight indeed, the reduction in the rural almost neutralising the effect of the increase in the urban rates. It will be noticed that the crude rate for 1902 is slightly reduced, and that for 1903 slightly increased. The explanation lies in the fact that the County rate has been calculated from the corrected urban and rural deaths, and not by means of a County correction factor. The result is that in 1902, when there were more rural deaths proportionately than in 1903, the reducing effect of the rural correction preponderated, while in 1903 the reverse occurred, but in both years the correction is very slight indeed, and for all practical purposes unnecessary. The County death-rate then, whether crude or corrected, is considerably below that of England and Wales, and that although the physical conditions which have been supposed to lead to a high Cancer mortality are markedly present in Essex (a retentive clay soil, in many parts marshy and liable to flooding). The corrected death-rate position of the County for the decade 1881-90 (the figures for 1891-1900 are not yet published) was thirty-first in the list of counties, there being thirty counties with a higher Cancer death-rate and thirteen only with a lower. This fact shows that for a considerable number of years past the corrected as well as the crude rate has been below the average, in spite of the presence of many of the conditions which have been regarded as conducive to a high Cancer mortality. The fact appears to be that a high or a low mortality may occur under the most diverse physical conditions, a fact which is clearly brought out by the comparison of the various areas within the County yielding high and low death-rates respectively.

Table XII., which goes back to 1900, the first year in which Cancer deaths were separately stated in the tables appended to the annual reports, shows no great increase in the death-rate

during this period. The rate for the County, including West Ham, during the years 1896-1900, is stated by the Registrar General as '69. Omitting West Ham it would be a little higher, so that there is even some slight evidence of improvement since that period.

Deaths from this disease are rarely mentioned in the annual reports, in fact only two reports contain any special reference thereto in the text.

DUNMOW. Twenty-eight deaths occurred. The advisability of disinfection is urged, in case the disease should ultimately be proved to be infectious.

SOUTHEND. The death-rate was '72 as against '95 last year. The majority of the deaths . . . occur among persons who have comparatively recently come to reside in the district. Inquiries are made regarding cancer deaths as to various conditions, such as previous cases in the same house or family; geological nature of soil of district; surrounding influences such as trees, water, nature of food, etc., with a view to the accumulation of a stock of facts which cannot fail to be of use in the future.

TUBERCULAR DISEASES.

TABLE XIII.

Death-rate per 1,000 Population.

	1903.		1902.		1901.	
	Phthisis.	Other Tubercular Diseases.	Phthisis.	Other Tubercular Diseases.	Phthisis.	Other Tubercular Diseases.
Urban Districts ...	'879	'397	'705	'338	'897	'526
Rural Districts ...	'886	'303	'768	'465	'868	'372
Administrative County	'881	'371	'723	'374	'888	'481
England and Wales ...	...	...	..	...	1'264	'543

The above are crude or uncorrected rates, but the margin of advantage possessed by Essex over the average for the country as a whole is so great that the corrected rates, if calculated, would certainly also be greatly below the average.

The position of the rural districts, however, if correction were applied, would be considerably less favourable than it is in comparison with that of the urban districts, since the population of the latter being younger, is naturally the more liable to tubercular disease. As in the case of cancer, this favourable position of the County is maintained in spite of physical conditions (difficulty of drainage and retentive nature of soil) which might well have been supposed likely to conduce to a high tubercular mortality.

Comparing the various districts, the highest phthisis death-rate is furnished by Rochford (2·01), which, curiously enough, records no deaths at all from other tubercular diseases. The next highest phthisis rates (omitting districts whose population is so small that little significance attaches to the rate recorded) are those of Clacton (1·57), Halstead Urban (1·48), Braintree Rural (1·31), and Wanstead (1·25). The lowest rates yielded by districts of any considerable population are those of Billericay (·33) and Epping Rural (·39).

The highest death-rate from other tubercular diseases, except amongst the smallest districts, is that of Clacton (·92), while those of Ongar (·7) and Harwich (·68) are also high.

It is not possible by the comparison of districts returning high and low tubercular death-rates respectively for 1903 to discover any relationship of mortality to nature of soil or physical configuration. It may, however, be fairly argued, from comparison with the rate for England and Wales (see Tables X., XI., and XIII.), that the great majority of districts in the County are unfavourable to the development and progress of consumption, and are therefore well fitted for the treatment of the disease. This being so, it is certainly desirable that Essex should take part in the movement which is in progress elsewhere for the establishment on selected sites of one or more public sanatoria. This has been suggested to several District Councils and to the Sanitary Committee of the County Council, but no inclination to take the matter up has been shown. A County Sanatorium would undoubtedly be of great advantage.

SECTION II.

PREVALENCE OF INFECTIOUS DISEASES.

Under the Infectious Diseases Notification Act (1899), the following diseases must be notified in all districts, viz. : Cholera, Plague, Small-pox, Diphtheria and Membranous Croup, Scarlet Fever, Erysipelas, Puerperal Fever, and Typhoid, Typhus, Relapsing and Continued Fevers. In addition to the above, Chicken-pox in many districts, and Measles and Whooping-cough in a few, were added to the list of compulsorily notifiable diseases, but for our present purposes attention can only be paid to those diseases generally notifiable.

TABLE XIV.

TOTAL NUMBER OF CASES OF INFECTIOUS DISEASES
NOTIFIED 1892-1903.

Year.	Small-pox	Scarlet Fever.	Diphtheria and Membranous Croup.	Fevers—Typhoid and Continued.	Puerperal Fever.	Erysipelas.	Totals.	Rate per 1,000 population.
1903	96	2,528	1,659	589	42	750	5,664	6·4
1902	1334	3,251	2,017	987	44	857	8,477	9·9
1901	227	2,961	2,628	790	40	716	7,362	9·1
1900	18	2,702	2,395	840	54	718	6,718	8·3
1899	3	2,769	1,712	874	52	803	6,213	7·9
1898	5	2,371	1,418	854	30	664	5,342	7·2
1897	0	2,956	1,256	773	48	710	5,743	8·2
1896	19	2,931	1,437	888	43	733	6,051	9·0
1895	63	2,482	1,738	712	26	661	5,682	8·9
1894	420	2,511	1,619	648	37	785	6,020	9·5
1893	235	3,952	2,009	776	61	1,100	8,133	13·3
1892	33	3,013	1,613	490	24	797	5,970	10·0
Average for the 12 years	204	2,869	1,792	768	42	774	6,448	9·0

Table XIV. records the notifications made during 1903, and contrasts them with those of former years, there being no cases of Cholera, Plague, Typhus, or Relapsing Fever to record. There is as usual a discrepancy between the figures given in the Monthly Returns and those of the Annual Reports. The latter are embodied in the table in the appendix, and the total, 5,664, is seen to be, with the one exception of 1898, the smallest recorded since 1892, while the rate per 1,000 of population, 6.4, is considerably below any previously recorded. This low rate contrasts with those of 1901 and 1902, which were somewhat above the average of recent years, the excess being largely due to the Small-pox epidemic.

Notwithstanding the great diminution in cases of notifiable disease from 8,477 in 1902 to 5,664, the Zymotic Death-rate is approximately the same for the two years (see Table VII). This is due to the fact that the deaths from Measles, Whooping-cough and Diarrhœa, diseases which, although they are not (generally) notifiable, are included in Table VII., and contribute to the Zymotic Death-rate, have increased considerably. It follows that fewer deaths have resulted from the diseases at present under consideration, which appear in both tables, and the diminution in deaths having more than kept pace with that in notifications, the mild type of these diseases noted in last year's report as prevalent in 1902 has been more than maintained. To quote exact figures, the 8,477 cases notified in 1902 caused 603 deaths, and the 5,664 in 1903 only 303 deaths, or 1 in 14 and 1 in 19 cases respectively. If in order to make the two years more fairly comparable by eliminating the influence of the Small-pox epidemic of 1902, we omit in both the cases of and deaths due to that disease, the fatality in 1902 becomes one death in 16 cases, and in 1903 one in 20. Thus not only is the proportionate number of cases of notifiable infectious disease in 1903 exceptionally small, but the type prevalent has been exceptionally mild. These facts help to explain the wonderfully low general death-rate recorded for the year.

Of the 5,664 cases, 4,476 occurred in the urban, and 1,118 in the rural districts. Out of every 1,000 persons in the former districts, seven have suffered from one of the notifiable infectious diseases during the year, whilst in the latter districts not quite five (4·9) persons have been attacked. Both these rates are the lowest so far recorded, and contrast with averages for the preceding 12 years of 10·7 and 7·9 respectively.

Table XIV. shows further that there has been no excessive prevalence of any one of the diseases included in it, the number of cases in proportion to population being in every instance considerably below the average.

DISTRIBUTION THROUGHOUT THE COUNTY OF COMPULSORILY
NOTIFIABLE INFECTIOUS DISEASES GENERALLY.

TABLE XV.

Urban Districts.	No. of Cases Notified.	No. per 1,000 In- habitants.	Diseases most prevalent.
Barking	341	13·6	Diphtheria
Braintree	2	·4	Scarlet Fever
Brentwood	16	2·8	Erysipelas
Brightlingsea	11	2·4	Enteric Fever
Buckhurst Hill	11	2·2	Scarlet Fever
Burnham	21	6·8	Diphtheria
Clacton	61	8·0	"
Chelmsford	75	5·8	Scarlet Fever
Chingford	10	2	Diphtheria
Colchester	242	6·2	Scarlet Fever
East Ham	1069	9·68	"
Epping	9	2·30	"
Frinton	1	1·25	Enteric Fever
Grays	68	4·6	Scarlet Fever and Enteric Fever
Halstead	120	19·67	Diphtheria and Scarlet Fever
Harwich	26	2·5	Enteric Fever
Ilford	364	6·7	Scarlet Fever
Leigh-on-Sea	16	3·9	Enteric Fever
Leyton	734	7·2	Scarlet Fever
Loughton	33	6·6	"
Maldon	18	3·21	"
Romford	78	5·4	Scarlet Fever and Diphtheria
Saffron Walden	17	2·90	Scarlet Fever
Shoeburyness	20	4·68	Enteric Fever
Southend-on-Sea	237	6·4	Enteric Fever, Diphtheria and Scarlet Fever
Waltham Holy Cross	28	4·2	Scarlet Fever]
Walthamstow	657	6·18	"
Wanstead	48	5·4	Diphtheria and Scarlet Fever
Walton-on-the-Naze	5	2·4	Diphtheria
Witham	4	1·1	Enteric Fever
Wivenhoe	38	15·2	Diphtheria and Scarlet Fever
Woodford	92	6·4	Scarlet Fever and Diphtheria

TABLE XV.—*continued.*

Rural Districts.			No. of Cases Notified.	No. per 1,000 In- habitants.	Diseases most prevalent.
Belchamp	...	...	6	1.24	Erysipelas
Billericay	...	...	44	2.9	Scarlet Fever and Diphtheria
Braintree	..	...	41	2.26	Scarlet Fever
Bumpstead	...	...	3	1.21	Diphtheria only
Chelmsford	...	...	102	4.26	Diphtheria and Scarlet Fever
Dunmow	...	...	19	1.22	Erysipelas
Epping	...	...	38	3.0	Scarlet Fever
Halstead, No. 1	...	...	39	8.55	"
Halstead, No. 2	...	...	20	3.51	Diphtheria and Typhoid Fever
Lexden and Winstree	...	...	52	2.7	Scarlet Fever
Maldon	...	..	60	4.10	"
Ongar	...	...	38	3.8	Scarlet Fever and Erysipelas
Orsett	...	...	136	6.46	Scarlet Fever, Diphtheria and Typhoid Fever
Rochford	...	...	115	7.4	Enteric Fever
Romford	...	...	320	16.0	Diphtheria
Saffron Walden	..	..	42	4.0	Scarlet Fever
Stansted	...	...	37	5.37	Scarlet Fever and Diphtheria
Tendring	...	...	76	3.6	Scarlet Fever

Table XV. gives the number of cases notified in each district, together with the diseases which have been most prevalent in each during the year.

In proportion to population, most cases have occurred in Halstead Urban District, with Romford Rural and Barking (in which being much larger districts, the figures are less liable to accidental variation), second and third on the list respectively. In all three cases Diphtheria was the disease most prevalent. No district remained entirely free from notifiable diseases, but, as in several recent years, their incidence upon Braintree Urban District was exceptionally light.

SMALL-POX.

TABLE XVI.

Urban Districts.		No. of Cases.	No. of Deaths.	Rural Districts.		No. of Cases.	No. of Deaths.
Barking	...	27	2	Belchamp	...	0	0
Braintree	...	0	0	Billericay	...	0	0
Brentwood	...	0	0	Braintree	...	2	0
Brightlingsea	...	0	0	Bumpstead	...	0	0
Buckhurst Hill	...	0	0	Chelmsford	...	1	0
Burnham	...	0	0	Dunmow	...	0	0
Clacton	...	0	0	Epping	...	0	0
Chelmsford	...	1	0	Halstead 1	...	0	0
Chingford	...	0	0	Halstead 2	...	0	0
Colchester	...	24	5	Lexden & Winstree	...	3	0
East Ham	...	5	0	Maldon	...	2	0
Epping	...	0	0	Ongar	...	0	0
Frinton	...	0	0	Orsett	...	0	0
Grays	...	1	0	Rochford	...	0	0
Halstead	...	0	0	Romford	...	2	0*
Harwich	...	0	0	Saffron Walden	...	0	0
Ilford	...	9	1	Stanstead	...	0	0
Leigh-on-Sea	...	0	0	Tendring	...	0	0
Leyton	...	3	0				
Loughton	...	0	0				
Maldon	...	0	0				
Romford	...	5	0				
Saffron Walden	...	0	0				
Shoeburyness	...	0	0				
Southend-on-Sea	...	5	0				
Waltham Holy Cross	...	3	0				
Walthamstow	...	2	0				
Walton-on-the-Naze	...	0	0				
Wanstead	...	0	0				
Witham	...	0	0				
Wivenhoe	...	0	0				
Woodford	...	1	0				
		86	8			10	0

*4 deaths occurred in the West Ham Hospital but did not belong to this district; they are therefore excluded.

The year 1903 contrasts forcibly with its predecessor as regards Small-pox, the cases having fallen from 1,334 to 96, and the deaths from 181 to 8. The epidemic of 1901-02 terminated in the summer of the latter year, and since then, though there have from time to time been localised sporadic outbreaks of the disease in various parts of the County, there has been no general prevalence.

The chief outbreaks in 1903 were those at Barking and Colchester, where 27 and 24 cases occurred respectively. In each instance the disease was imported by a member of the

"tramp" class, and the same circumstance is noted in the case of the Romford Urban outbreak, where five cases occurred. Thus out of the 96 cases 54, more than half, were definitely traced to tramps (two of the Colchester cases had a different origin from the others), and for many of the other cases in which the source of infection was not ascertained, tramps may have been responsible. This is in accordance with the general experience throughout the country of recent years, much attention having been directed of late to the danger resulting to the community from the facility with which, owing to their peculiar habits and mode of life, Small-pox is disseminated by members of the tramp fraternity. It is not only that tramps frequently *introduce* the disease—in the majority of the cases where the mode of importation was ascertained, it was by persons other than tramps—but that, frequenting casual wards and common lodginghouses as they do, they are brought into intimate contact with large numbers of other people; and further that, as they often neglect to obtain medical advice, the cases occurring amongst them frequently escape notification until much mischief has been done. The desirability of compulsory vaccination and revaccination for persons of this class, as advocated by Dr. Savage in his report, and by many other Medical Officers of Health, appears in view of the above considerations to be unquestionable.

The protective influence of vaccination is well exemplified by the small outbreak at Southend, the history of which is detailed at considerable length by Dr. Nash. It must be borne in mind that one beneficial result of the recent widespread epidemic is that the population as a whole is now much better vaccinated than it was three years ago, but for which circumstance it is very possible that some of the numerous sporadic outbreaks recorded would have spread much more widely than they did. Even as things were, more cases were notified in 1903 than in any year from 1895 to 1900 inclusive, but as Small-pox was throughout the year more or less prevalent in

various parts of England, especially in the northern and mid-land counties, this is not to be wondered at.

It will be noticed that in the Orsett district, which suffered so severely in 1902, not a single case was notified during 1903. This is, of course, entirely consistent with the explanatory hypothesis of infection from the large number of cases assembled in neighbouring hospitals advanced in last year's report. In 1903 there was no such assemblage of cases as in the previous year, and the district then so severely affected does not report a single case.

BARKING. The disease was introduced in March by a tramp, from a common lodginghouse at Romford. From that time till its cessation in June, 27 cases occurred, many of which were traceable to contact with the man in question. Fines for non-notification of the disease were in two cases inflicted upon relatives.

COLCHESTER. Two simultaneous but independent importations of the disease occurred in May. In one case a visitor from London developed the disease and infected one other person in the same house, and in the other a boy, practically a tramp, though in temporary employment, who came to Colchester while incubating the disease, and for three days distributed free samples of household polish while in an actively infectious condition, caused 21 secondary cases. As he was staying in a public house, the Sanitary Committee paid the full price of the 20 beds for two weeks to the owner, thereby preventing fresh lodgers from being taken in, and inducing those who were there to stay for the two weeks. All the other usual preventive measures were taken, including the keeping of contacts from their work in special cases, and a certain amount of house to house visitation for the purpose of inducing vaccination.

Dr. Savage draws attention to two matters in connection with the outbreak: (1) the desirability of further legislation with regard to tramps, at least some powers of compulsory vaccination and revaccination; and (2) the treatment and

control as common lodginghouses of public houses which in fact are such in every respect.

GRAYS. The single case notified occurred in a common lodginghouse.

ILFORD. Nine cases were notified, but in only one could the source of infection be traced.

Dr. Stovin recommends :—

1. Transference of control of vaccination to the Sanitary Authority.
2. Compulsory re-vaccination.
3. Compulsory vaccination of "contacts."
4. The retention of the "conscience clause."

ROMFORD URBAN. "Five cases occurred in the town, all of them arising from infection brought by a tramp to one of the lodginghouses."

SOUTHEND. A small outbreak, consisting of five cases confined to one family, occurred, of which Dr. Nash gives a detailed account, examining especially the evidence afforded as to the protective influence of vaccination. The family consisted of father, mother, and five children. Belonging to the sect of the Peculiar People, they were opposed to vaccination, and the four younger children were unvaccinated; the other three members of the household had been vaccinated in infancy. It seemed probable that the disease was brought from Rochford, whence members of the sect are in the habit of coming to Southend on Sundays, and where a case had occurred amongst them. An unvaccinated boy of ten was first attacked and secondarily infected his father and mother and two younger children. The severity of attack was in all cases proportionate to the amount of protection by vaccination, and the eldest boy, vaccinated $11\frac{1}{2}$ years previously, escaped with a headache and slight sore throat.

WALTHAM HOLY CROSS. The disease was introduced three separate times, but never spread beyond the first case.

BRAINTREE (R). Two cases occurred during the year, making five separate outbreaks between April 1902 and June

1903. In no instance did a further case occur after notification. The sanction of the Local Government Board has been obtained for the purchase of a site for isolation accommodation, and meanwhile the cases are treated in the Lexden and Winstree District Hospital.

LEXDEN AND WINSTREE. Two small outbreaks occurred, the first in March amongst the men working on the Light Railway. The infection was proved to have been brought by a travelling navvy. The two cases which occurred were isolated in the tent hospital, and both recovered. The second outbreak was limited to a single case, a woman who evidently was infected while visiting in a neighbouring town where the disease was prevalent.

MALDON (R). One man working on the above-mentioned Light Railway in the Lexden District became infected, and he infected his father. The usual methods for prevention of spread were adopted, and no further cases occurred.

ROCHFORD. The disease was twice introduced, once by a bargeman from Woolwich, and again from London, but on each occasion was limited to the man introducing it, the usual preventive measures being adopted.

SCARLET FEVER.

This disease has been much less prevalent in proportion to population in 1903 than in any previous year of which complete records are available. There has, however, been a considerable increase in the fatality. From 1895 the deaths per 100 cases gradually fell from 3·7 to ·96 in 1900; now this rate is increasing again, being 1·4 for 1901, 1·5 for 1902, and 2·2 for 1903. Notwithstanding this considerable increase in severity of type, most of the local reports which refer to the matter speak of the type as "mild" or "very mild," and in Leyton and Barking alone is the type said to have increased in severity. No doubt the explanation is that the type prevalent at present is contrasted, not with that of two or three, but of twenty or thirty years ago, when it was much more severe.

The highest fatality recorded is in the Tendring District, where four deaths occurred out of the forty cases notified. Frinton (as last year) and Bumpstead were entirely free from the disease.

Considerable difference of opinion is manifested as to the utility of isolation in this disease. My own position in the matter is sufficiently indicated by the extracts from my report for Chelmsford (R). Several of the Medical Officers of Health note the absence of "return" cases in their experience. The chief causes of spread of the disease referred to are delayed or mistaken diagnosis, and the frequency of mild and unrecognised cases.

BRIGHTLINGSEA. Dr. Dickin says :—"The very infectious nature of Scarlet Fever, which makes it so desirable at first sight to isolate in a hospital, is the very cause of the failure of such isolation. The trouble is not so much while the patient is in hospital, but when he comes out it is very difficult to insure his freedom from infection, the result often being that he goes out only to become a fresh focus of infection."

CLACTON. In contrast with the above, Dr. Cook says :—"There never has been a recurrent case from the hospital."

COLCHESTER. Dr. Savage notes that no return cases have occurred. Further, "The disease is no doubt largely spread by mild unrecognised cases. One such was traced to be the cause of a small outbreak of six cases at Old Heath, while in investigating supposed cases of Measles, three unrecognised cases of Scarlet Fever were in this way found."

ILFORD. Dr. Stovin comments on the difficulty of disinfecting houses thoroughly. The method in use is Mackenzie's formalin spray. In six instances during the year (out of 115 cases isolated), a second case arose in a house from which the first had been removed to hospital, more than a fortnight after the removal, and therefore not infected directly by the first case. "Perhaps this is not to be wondered at when one finds a patient suffering from Scarlet Fever wandering all over the

house before removal. In these circumstances it is practically impossible to disinfect the whole house."

Under the new Education Act, it has been possible more fully than before to enlist the aid of the teachers in the detection of infectious disease, and two cases of Scarlet Fever were discovered by their aid.

SOUTHEND. In one case infection appeared to have been brought from London by one of a number of slum children sent down in batches for a fortnight's holiday. In another case the disease followed on the receipt of a letter by post from an infected house in the north of England. Only one possible "return case" occurred during the year.

WALTHAMSTOW. Here also Dr. Clarke comments on the difficulty of thorough disinfection, owing to concealment of facts by the patients' relatives. "It is very difficult to make persons realize that in this matter candour and truthfulness are desirable, and the measures taken are for the public good." A circular letter has been sent to all the local medical practitioners informing them that no certificate of private disinfection will in future be accepted by the Council as satisfying the provisions of the Infectious Diseases Prevention Act. With the co-operation of the profession, the desired alteration has been effected.

CHELMSFORD (R). Discussing the necessity for Isolation Hospital accommodation, Dr. Thresh says:—"These hospitals are primarily for the reception of patients who cannot be properly isolated at home. For this purpose only a moderate number of beds is necessary." After alluding to the investigations carried out by Dr. Millard, of Leicester, he says: "If they (his conclusions) are correct, is it not a great waste of public money to attempt to isolate all the cases which occur?" Cases mentioned as requiring isolation are those occurring in overcrowded houses, in places where young people are employed, servants in families, and in houses where milk is sold, etc.

DUNMOW. Six cases were notified—an unusually low number. In none could the source of infection be traced. The Medical Officer of Health attributes this circumstance in great measure to the late date at which notifications are frequently

SCARLET FEVER.

TABLE XVII.

Urban Districts.	No. of cases.	No. of deaths.	Rural Districts.	No. of cases.	No. of deaths.
Barking ...	70	1			
Braintree ...	2	0	Belchamp ...	1	0
Brentwood ...	5	0	Billericay ...	16	0
Brightlingsea ...	3	1	Braintree ...	24	0
Buckhurst Hill ...	6	0	Bumpstead ...	0	0
Burnham ...	1	0	Chelmsford ...	40	2
Clacton ...	19	0	Dunmow ...	6	1
Chelmsford ...	44	0	Epping ...	18	1
Chingford ...	1	0	Halstead, No. 1 ...	28	0
Colchester ...	100	1	Halstead, No. 2 ...	1	0
East Ham ...	659	13	Lexden and Winstree ...	19	0
Epping ...	6	0	Maldon ...	30	0
Frinton ...	0	0	Ongar ...	15	0
Grays ...	28	0	Orsett ...	57	1
Halstead ...	53	0	Rochford ...	28	0
Harwich ...	3	0	Romford ...	42	2
Ilford ...	181	2	Saffron Walden ...	30	0
Leigh-on-Sea ...	1	0	Stanstead ...	18	0
Leyton ...	397	13	Tendring ...	40	4
Loughton ...	24	0			
Maldon ...	8	0			
Romford ...	23	0			
Saffron Walden ...	16	0			
Shoeburyness ...	5	0			
Southend-on-Sea ...	73	3			
Waltham Holy Cross ...	9	0			
Walthamstow ...	292	6			
Walton-on-the-Naze ...	1	0			
Wanstead ...	19	2			
Witham ...	1	0			
Wivenhoe ...	17	0			
Woodford ...	47	2			
Totals...	2115	44	Totals...	413	11

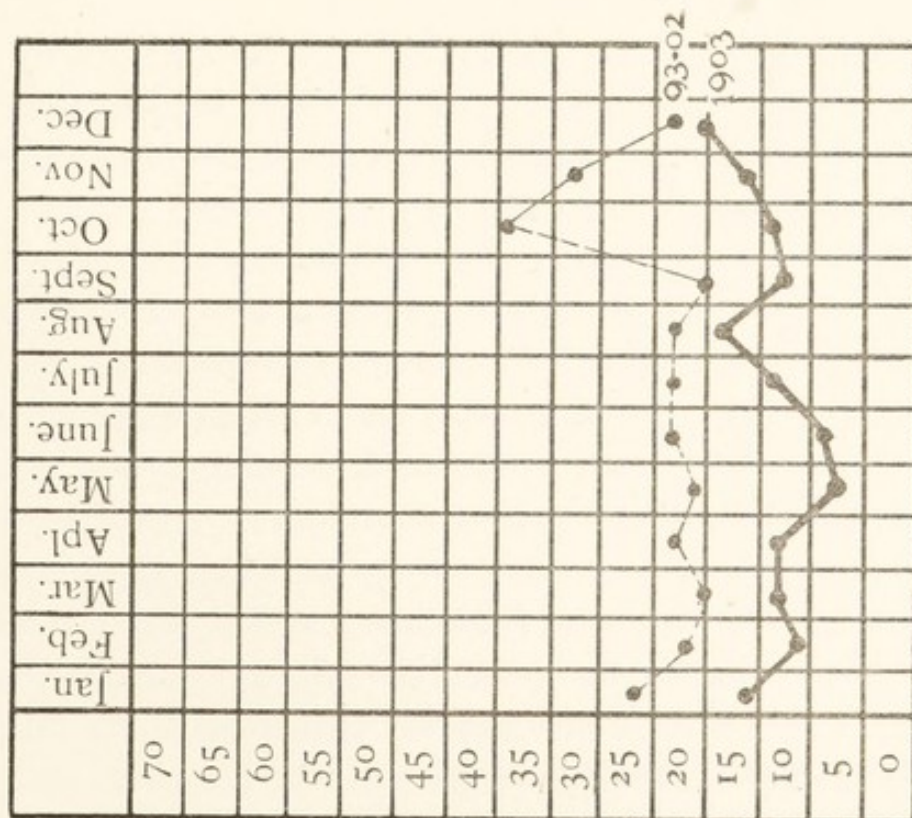
received, the medical attendants when called in after the rash has faded, generally leaving over the notification until peeling of the skin is noticed—a practice which he deprecates.

EPPING (R). The Medical Officer of Health comments on the decreased virulence of the disease, only one death having

SCARLET FEVER.

RURAL DISTRICTS.

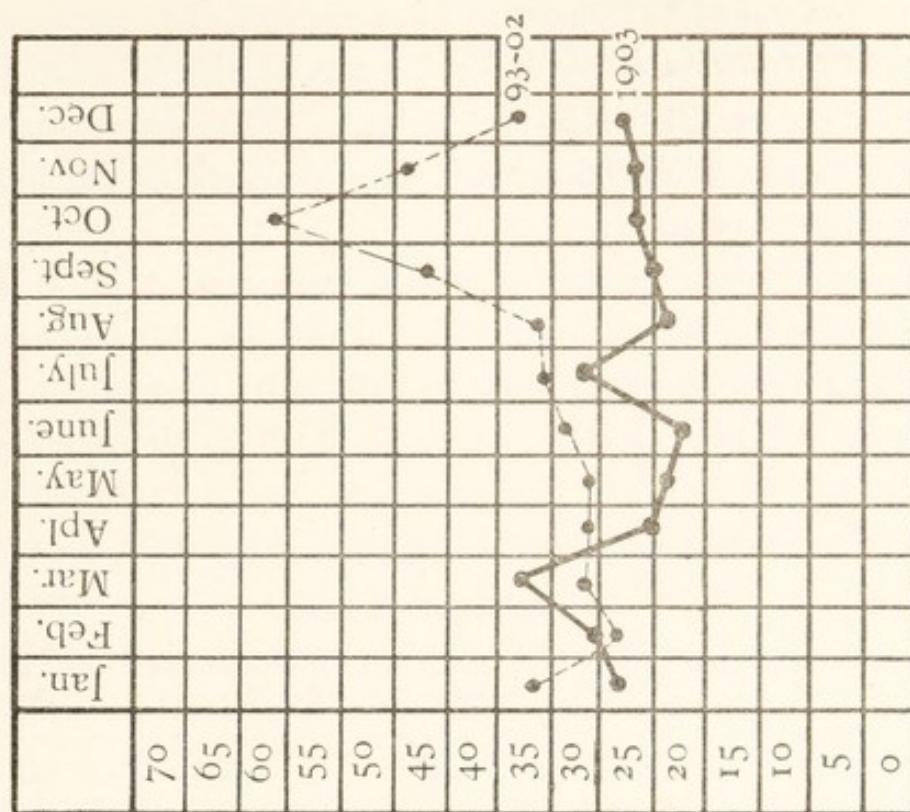
CASES PER 100,000 POPULATION.



SCARLET FEVER.

URBAN DISTRICTS.

CASES PER 100,000 POPULATION.



occurred out of 171 cases notified during the last four years, and that from nephritis following a mild attack.

MALDON (R). Hospital isolation of notified cases is found only to have a limited value, owing to spread of the disease by unnotified cases.

TENDRING. A severe school outbreak, necessitating the closure of the school, occurred in Tendring. It evidently arose from cases of so-called German Measles, through an error of diagnosis. Four deaths occurred out of the 40 cases.

DIPHTHERIA AND MEMBRANOUS CROUP.

TABLE XVIII.

Case-rate and Death-rate per 1,000 Population, and Deaths per 100 Notifications, or Fatality.

	1903.			1902.			Twelve years, 1890-1901.		
	Case-rate.	Death-rate.	Fatality.	Case-rate.	Death-rate.	Fatality.	Case-rate.	Death-rate.	Fatality.
Urban Districts ...	1·89	·18	9·4	2·48	·28	11·5	2·88	·48	16·7
Rural Districts ...	1·87	·14	7·7	2·0	·15	7·8	1·89	·33	17·5
Administrative County ...	1·88	·17	8·9	2·35	·24	10·6	2·47	·42	17·0
England and Wales ...	—	·18	—	—	·23	—	—	·26	—

The diminution in the prevalence of Diphtheria and Membranous Croup noted in last year's report was manifested to a still greater extent in 1903, and, as the proportion of cases which proved fatal also diminished, the fall in the death-rate is even greater, it having been considerably less than half the average for recent years. Braintree (U.), Buckhurst Hill, Frinton, Shoeburyness and Belchamp entirely escaped infection.

The continued diminution in fatality is especially satisfactory, as in the absence of proof of corresponding diminution in severity of type of the disease, it may be taken as pointing to improvement in the therapeutic measures adopted, especially

the increased and earlier use of Antitoxin. Many of the Medical Officers of Health refer to this subject, and while one or two mention diminution in severity of the disease as compared with that prevalent some decades ago, all are agreed in attributing the change in a great measure to the use of Antitoxin. In Barking, where the fatality was 9·6, very little above the average, attention is drawn to the increased severity of the cases, which has been more than neutralised by the earlier use of Antitoxin.

The great importance of employing this remedy at the earliest possible moment is alluded to in several of the reports. In cases where it is injected within 24 hours of the onset of illness, the death-rate is always, as in Barking and Colchester, practically nil. This fact has been pointed out so often that it might seem superfluous to repeat the statement, but it is to be feared that in many instances the matter does not receive that practical attention which its importance demands. The order of procedure should be, in all cases, clinically diphtheria, first, inject Antitoxin, secondly, confirm diagnosis by the aid of bacteriology, and not, as is too often the case, *vice versa*.

While all are agreed as to its curative value, the opinions expressed as to the efficacy of Antitoxin as a means of securing the healthy against attack after exposure to infection differ considerably. In some districts, as Halstead (U.), Wivenhoe and Chelmsford (R.), it is used for this purpose, but in others not, owing partly to prejudice on the part of parents.

As in the case of Scarlet Fever, a number of the reports (Colchester, Southend, Halstead U., Chelmsford R., etc.) call attention to the frequency with which the disease is spread by means of cases which present either exceedingly mild symptoms, attributed in many cases to slight "colds," etc., or no symptoms at all. The latter cases are brought to light only by bacteriological examination of the throats of apparently healthy "contacts." The frequency of such cases constitutes the greatest obstacle to the extermination of zymotic disease by means of isolation.

DIPHTHERIA AND CROUP.

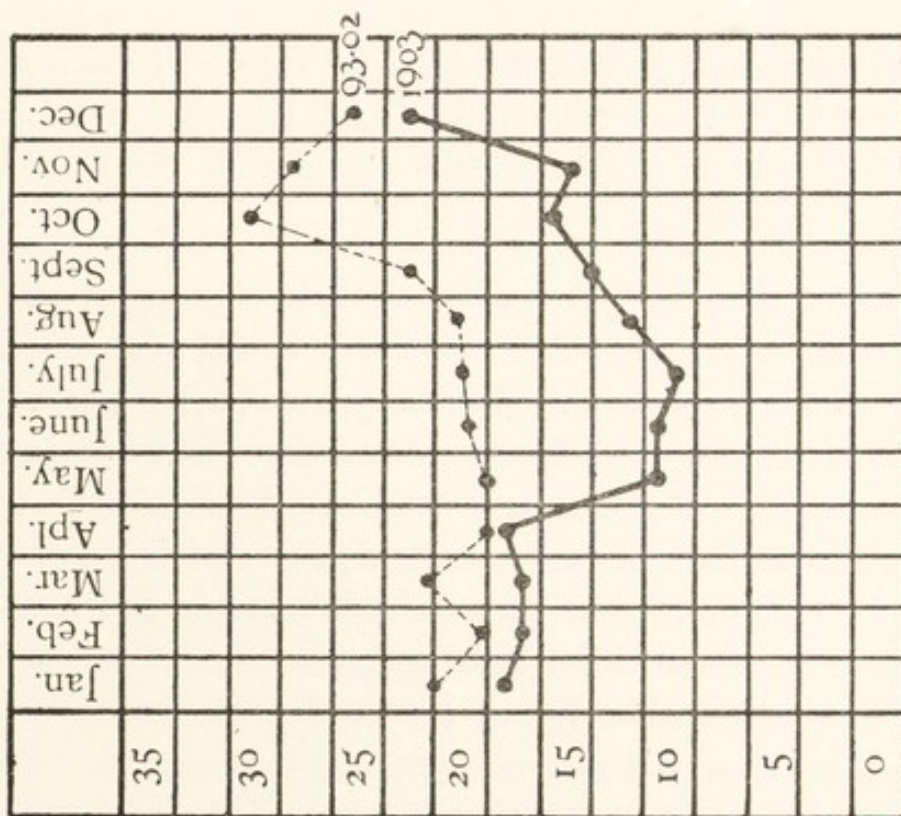
TABLE XIX.

Urban Districts.		No. of Cases.	No. of Deaths.	Rural Districts.		No. of Cases.	No. of Deaths.
Barking	...	197	19	Belchamp	...	0	0
Braintree	...	0	0	Billericay	...	15	1
Brentwood	...	2	0	Braintree	...	3	0
Brightlingsea	...	3	0	Bumpstead	...	3	1
Buckhurst Hill	...	0	0	Chelmsford	...	43	3
Burnham	...	11	1	Dunmow	...	4	0
Clacton	...	35	3	Epping	...	8	0
Chelmsford	...	20	1	Halstead, No. 1	...	6	1
Chingford	...	6	0	Halstead, No. 2	...	8	0
Colchester	...	55	5	Lexden and Winstree	...	9	0
East Ham	...	211	14	Maldon	...	13	2
Epping	...	3	0	Ongar	...	5	1
Frinton	...	0	0	Orsett	...	34	8
Grays	...	11	1	Rochford	...	16	3
Halstead	...	54	4	Romford	...	252	8
Harwich	...	1	0	Saffron Walden	...	1	1
Ilford	...	95	14	Stanstead	...	12	1
Leigh-on-Sea	...	0	0	Tendring	...	23	5
Leyton	...	186	27				
Loughton	...	5	0				
Maldon	...	2	0				
Romford	...	20	1				
Saffron Walden	...	1	0				
Shoeburyness	...	0	0				
Southend-on-Sea	...	62	4				
Waltham Holy Cross	...	6	0				
Walthamstow	...	152	17				
Walton-on-the-Naze	...	2	1				
Wanstead	...	19	0				
Witham	...	1	0				
Wivenhoe	...	13	0				
Woodford	...	31	1				
Totals	...	1,204	113	Totals	..	455	35

Table XIX. shows that in 1903 Diphtheria was most prevalent in Romford (R.), Halstead (U.) and Barking, and caused the heaviest mortalities in the same districts, the order, however, being reversed, viz. :—Barking, Halstead and Romford. In the latter district the great epidemic prevalence (case-rate = 12·6) was accompanied by the exceptionally low fatality of only 3 per cent. The highest fatality rates recorded are those of Orsett (24), Tendring (22), Ongar (20), Rochford (19), Ilford (14·6), and Leyton (14·5).

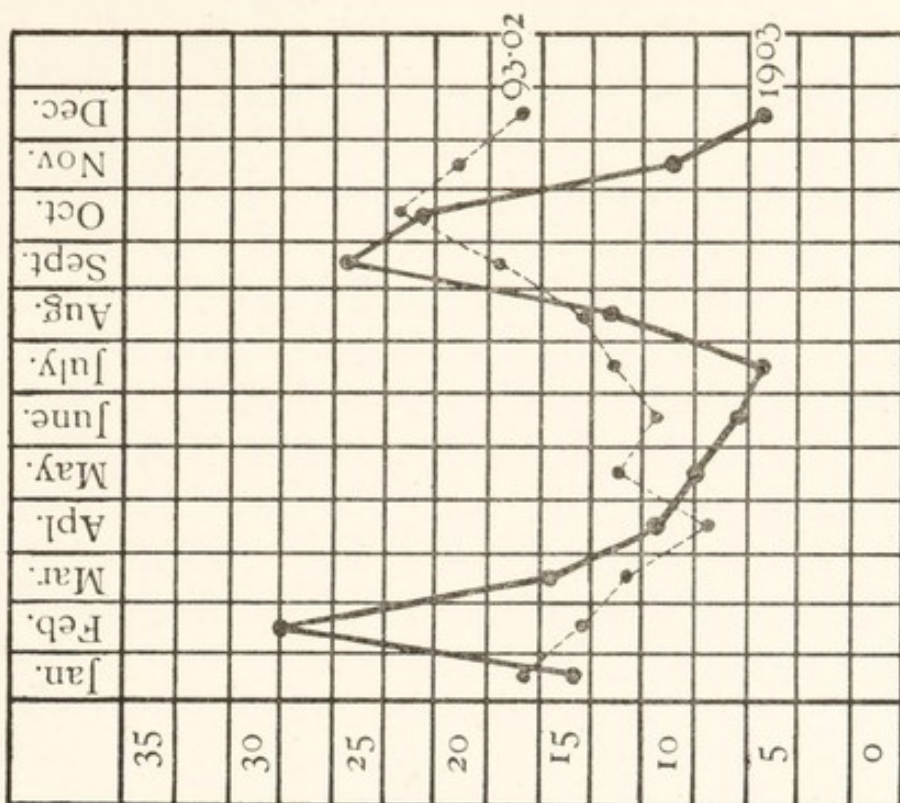
DIPHTHERIA AND CROUP.

URBAN DISTRICTS.
CASES PER 100,000 POPULATION.



DIPHTHERIA AND CROUP.

RURAL DISTRICTS.
CASES PER 100,000 POPULATION.



BARKING. The disease has been continuously prevalent throughout the year. The majority (59.5 per cent.) of the cases occurred in children attending the various elementary schools, and 56 per cent. of these attended one school (North Street), where on investigation certain drainage defects were met with. After these had been remedied, however, and the school had been closed for the summer holidays, cases continued to occur as before. Another (Castle) school gave a higher number of cases than North Street in proportion to the number of scholars on the Register. This was due to a sharp epidemic which was promptly checked by isolation of cases and contacts. The same precautions have been taken (unsuccessfully) at North Street school. They include inspection of the class in which a case has appeared by the Medical Officer of Health, exclusion or bacteriological examination (which has always proved negative) of any suspicious children, ventilation, disinfection of slates, etc., disinfection of the buildings during the holidays, exclusion from school of home contacts with infected cases, and hospital isolation until throat and nose discharges are non-infective. Antitoxin has been used in all cases, no death occurring where it was injected within 24 hours of onset. It is not used as a prophylactic. The type of case has been for the most part severe, the membrane spreading with extreme rapidity.

BRENTWOOD. "The value of bacteriology as an aid to diagnosis was rendered manifest in a doubtful case which occurred in this district. Swabbing was taken from the throat and sent to Dr. Thresh for examination, and the bacteriological diagnosis was Diphtheria. Although the medical man in attendance did not consider the patient a desirable inmate of a school, yet it was a nice point as to whether at the time he saw the child he was suffering from the disease, for he says, it is well known that the germs of the disease last a long time in the throat after a patient's recovery. However, a few days afterwards another undoubted case occurred in the school

removing all scepticism as to the value of bacteriological examinations."

COLCHESTER. Particulars are given of the deaths which occurred, with special reference to treatment. No deaths took place in cases where Antitoxin was given early in the course of the disease, and in only one fatal case could the patient be said to have been treated with Antitoxin at all. A table is given showing the fall in fatality which has accompanied the introduction of Antitoxin as a remedy in Colchester. The fatality, which ranged from 20-30 or more per cent. in 1896-1900 when Antitoxin was not used, has now fallen to 9 per cent. Twenty per cent. of the other children in the houses in which Diphtheria developed were found to harbour bacilli.

EAST HAM. There have been fewer deaths than in any year since 1892. Antitoxin is supplied free. For the six years 1898 to 1903, during which it has been in use, the case mortality has been 9.5, and for six years before that 21.34.

HALSTEAD (U.). A considerable outbreak occurred during the Autumn amongst the children attending two of the schools, the third school practically escaping. It differed from the extensive epidemic of ten years earlier in being spread by the schools and almost confined to school-children, in being independent of insanitation, and in the case-mortality (7 per cent. as against 40 per cent. in the earlier outbreak). The disease was introduced by a family brought to the town for change of air, one of whom had just been discharged from a hospital elsewhere as convalescent from Scarlet Fever. Another child in the family developed Scarlet Fever within a week, and on isolation in the Halstead hospital infected other children in the Scarlet Fever ward with Diphtheria. Bacteriological examination then proved that both this and the convalescent child had been doubly infected with Scarlet Fever and Diphtheria. Prophylactic doses of Antitoxin prevented further spread of Diphtheria in the hospital, but spread into the town took place, the earlier cases occurring near the houses of recently discharged patients. In spite of disinfection of the schools and

other measures, the disease continued throughout the rest of the year, being maintained by mild unnotified cases, as proved both by the fact that several intervals between notifications exceeded the incubation period, and that in a number of cases children were discovered suffering from the after effects of Diphtheria, which had been thought to be an ordinary cold.

SOUTHEND. Dr. Nash describes a number of cases in which the disease was being spread in the schools by unrecognised cases, and in which this was put a stop to by exclusion of such cases, the suspicion as to their nature grounded on clinical evidence being confirmed by bacteriological examination. He adopts the prevalent view as to compulsory education being probably the chief factor in the spread of the disease at the present time, and adheres to Dr. Newsholme's (and Dr. Longstaff's) view of an inverse relation of Diphtheria prevalence to rainfall.

"During 1903 Antitoxin has unquestionably been used both earlier and more freely by the medical practitioners in the Borough than in any previous year. In consequence I have the satisfaction of recording the wonderful reduction in the case mortality during 1903, to 7.02—only half of the comparatively satisfactory figure recorded for 1902."

WALTHAMSTOW. The marked decline in the sickness and death-rate from these diseases (sickness-rate 1.4 in 1902 and 1903 as against 3.25 for 1890-1901, and corresponding reduction in the death-rate to .16 in 1903) "since the Sanatorium was opened has been maintained during the year." The time is not far off when all patients suffering from such a dangerous infectious disease will be treated in hospital.

WIVENHOE. The cases were of a mild form, and in all Antitoxin was used with good result. In some cases it was used also as a preventative. "This, I believe, had the effect of curtailing the epidemic."

WOODFORD. "This disease is now undoubtedly of a much milder type than it used to be." The fatality in the years 1890-97 was 12.3, whereas in 1898-1903 it has only been 5.8.

This fatality would seem to point to a type of disease much less severe in Woodford than in the county generally, where the rates for the last three years have been 1901, 11·3, 1902, 10·5, and 1903, 8·9. In Woodford, the improved treatment, and especially that by Antitoxin, has much to do probably with this lowered death-rate.

A conviction was obtained against a medical man for leaving a fatal case of "Membranous Croup" unnotified for four days.

CHELMSFORD (R). The prolonged prevalence at Writtle is at last diminishing. Fourteen cases were notified during the year, in contrast with 65, 87 and 60, in 1900, 1901 and 1902 respectively. The effect has been to diminish considerably the number of cases of infectious disease in the district. The type of disease has been mild, only three deaths resulting from 43 cases notified in the whole district. Antitoxin is generally used as a curative and occasionally as a prophylactic agent, but the prejudice of parents interferes with the latter use. Bacteriological examination has revealed the existence of a certain number of otherwise unrecognisable cases.

LEXDEN AND WINSTREE. The Medical Officer of Health expresses his regret that the Council have ceased to supply Antitoxin, as he had found great advantage arise from the practice. Fortunately, the disease is less prevalent now than it was a decade ago.

MALDON (R). Here also the disease is described as less prevalent than it was. Thirteen cases occurred during the year, whereas some years ago 70 to 100 were not unusual. The decrease is attributed in part to better diagnosis, excluding spurious cases which formerly would have been notified.

ORSETT. Thirty-four cases were notified and eight deaths occurred.

ROCHFORD. Three deaths occurred out of 16 cases. Antitoxin was not used in the fatal cases.

ROMFORD (R). An extensive prevalence is recorded. 251 cases were notified, 203 in and near Rainham, but only

eight deaths occurred; 117 cases were removed to the isolation hospital. The epidemic in Rainham is ascribed to the insanitary condition of the village, arising mainly from want of proper sewerage.

STANSTED. "The disease appeared to be in connection with the Church Schools, and when these were closed the epidemic rapidly abated. From enquiries which I made it would appear that sore throat had been a common ailment amongst the school children for two or three months. Probably some of the cases were diphtheritic, but being mild in character escaped observation."

TENDRING. Antitoxin was supplied by the Medical Officer of Health in each of the 23 cases, and was used speedily and freely; notwithstanding this five cases proved fatal.

TYPHOID AND CONTINUED FEVERS.

TABLE XX.

Case-rate and Death-rate per 1,000 Population, and Deaths per 100 Notifications, or Fatality.

	1903.			1902.			Twelve years, 1890—1901.		
	Case-rate.	Death-rate.	Fatality.	Case-rate.	Death-rate.	Fatality.	Case-rate	Death-rate.	Fatality.
Urban Districts ...	70	12	17.5	134	18	13.2	129	18	13.9
Rural Districts ...	59	10	16.8	9	13	12.4	79	13	16.5
Administrative County ...	67	12	17.3	123	17	13.0	111	17	15.3
England and Wales ...	—	10	—	—	13	—	—	18	—

The above table shows that both the prevalence of and mortality from Typhoid Fever have been much less than usual. They have both been less in fact than in any year since 1892. The cases met with, however, would appear to have been of a rather severe type, and the fatality, or case-mortality, is somewhat above the average, and much higher than last year, when

it was less than the average, but far more cases were met with, the result being that the death-rates were higher than in 1903.

The cases and deaths in the Thames Valley are as under:—

TABLE XXI.

	Cases.	Deaths.	Case-rate.	Death-rate.	Fatality.
East Ham ...	66	15	·60	·14	23
Barking ...	16	4	·64	·16	25
Romford (Rural) ...	12	2	·60	·10	17
Orsett (Rural) ...	28	5	1·33	·24	18
Grays ...	18	3	1·22	·20	17
Rochford (Rural) ...	62	8	4·01	·52	13
Leigh ...	13	2	3·20	·49	15
Southend ...	69	11	1·9	·30	16
Shoeburyness ...	11	1	2·6	·23	9
<hr/>					
Total ...	295	51	1·17	·20	17

In the whole of the remainder of the County the numbers of cases and of deaths happen to be almost exactly the same as in the Thames Valley—294 cases and 51 deaths, but the case and death rates are very different:—

	Case-rate.	Death-rate.
Thames Valley ...	1·17	·20
Other parts of County	·47	·08

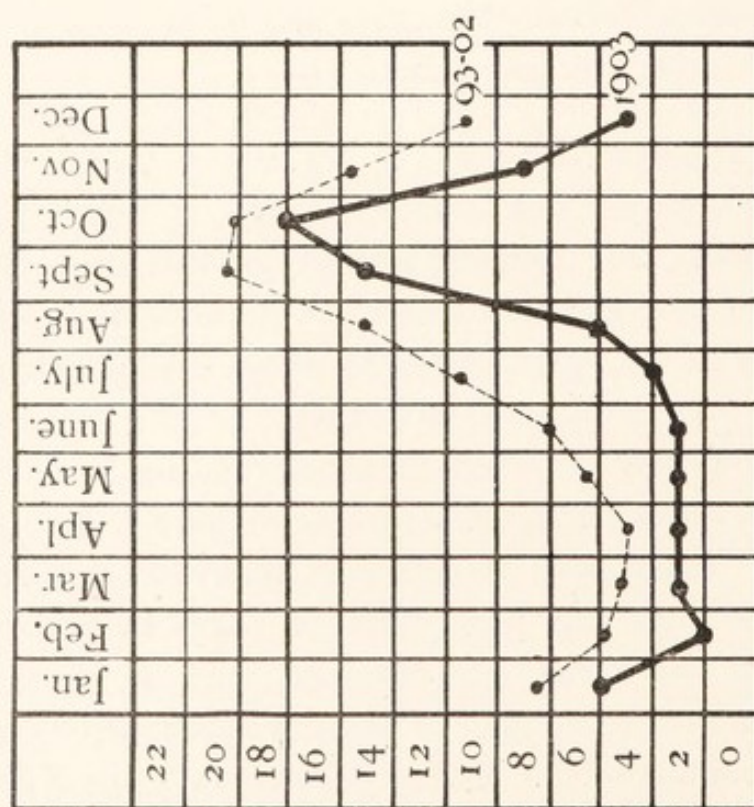
As usual, the greatest excess, in this area of excessive prevalence, is in the districts at the mouth of the river.

Many of the reports refer to cases arising from the consumption of contaminated shell-fish. Of the 589 cases about 110 are definitely referred to as originating in this way. A number of other reports allude, less definitely, to “some” or “several” cases as so caused, and many do not refer to the matter, so that the proportion of cases in which evidence of shellfish origin was to be obtained must be very large. In addition, a further number of cases is mentioned as secondarily arising from shell-fish. Of the districts in Table XXI. the four last, which return the highest rates, all record a considerable

TYPHOID AND ALLIED FEVERS.

URBAN DISTRICTS

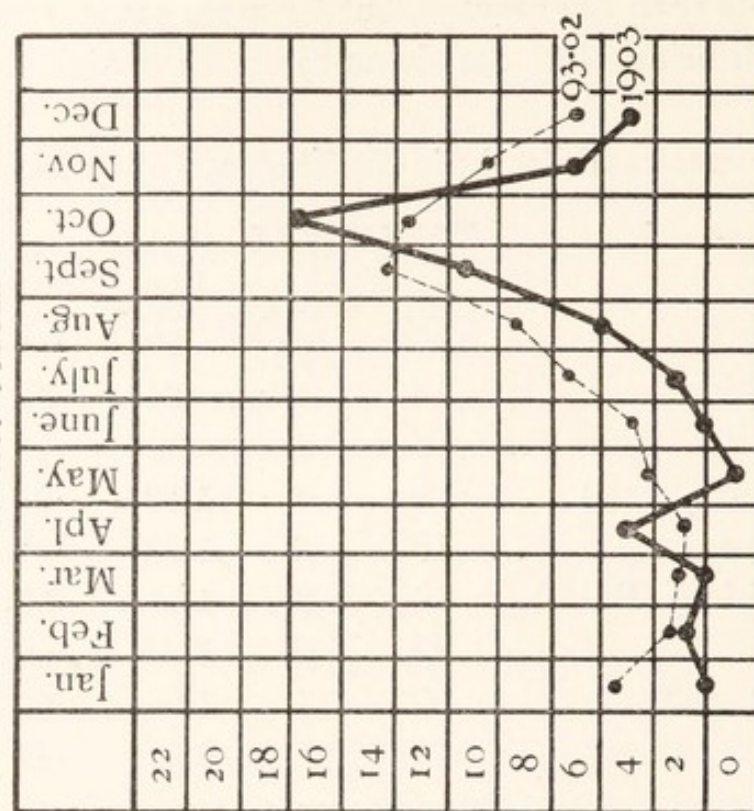
CASES PER 100,000 POPULATION.



TYPHOID AND ALLIED FEVERS.

RURAL DISTRICTS

CASES PER 100,000 POPULATION.



number of shell-fish cases, and in Southend and Shoeburyness the proportion is most remarkable. It is more than probable that this fact partly explains the continuous excess of the disease in these districts.

TYPHOID, CONTINUED, AND PUERPERAL FEVERS.

TABLE XXII.

Urban District.	Typhoid & continued Fevers.		Puerperal Fever.		Rural Districts.	Typhoid & continued Fevers.		Puerperal Fever.	
	No. of Cases.	No. of Deaths.	No. of Cases.	No. of Deaths.		No. of Cases.	No. of Deaths.	No. of Cases.	No. of Deaths.
Barking ...	16	4	3	1	Belchamp ...	0	0	0	0
Braintree ...	0	0	0	0	Billericay ...	3	3	2	1
Brentwood ...	2	0	0	0	Braintree ...	0	0	0	0
Brightlingsea ...	4	0	0	0	Bumpstead ...	0	0	0	0
Buckhurst Hill ...	1	0	0	0	Chelmsford ...	3	1	1	0
Burnham ...	1	0	1	1	Dunmow ...	0	0	0	0
Clacton ...	5	0	1	1	Epping ...	3	1	0	0
Chelmsford ...	4	1	1	0	Halstead, 1 ...	0	0	0	0
Chingford ...	0	0	0	0	Halstead, 2 ...	5	0	0	0
Colchester ...	17	2	0	0	Lexden and Winstree ...	8	0	0	0
East Ham ...	66	15	12	8	Maldon ...	10	3	0	0
Epping ...	0	0	0	1	Ongar ...	4	1	0	0
Frinton ...	1	1	0	0	Orsett ...	28	5	1	0
Grays ...	18	3	0	0	Rochford ...	62	8	1	1
Halstead ...	0	1	1	0	Romford ...	12	2	0	0
Harwich ...	21	2	0	0	Saffron Walden ...	0	0	0	0
Ilford ...	28	2	2	1	Stanstead ...	1	0	0	0
Leigh-on-Sea ...	13	2	0	0	Tendring ...	4	0	0	0
Leyton ...	56	10	4	3					
Loughton ...	1	0	0	0					
Maldon ...	3	1	1	0					
Romford ...	6	1	2	1					
Saffron Walden ...	0	0	0	0					
Shoeburyness ...	11	1	2	1					
Southend-on-Sea ...	69	11	0	1					
Waltham Holy Cross ...	2	0	1	0					
Walthamstow ...	88	19	6	0					
Walton-on-the-Naze ...	0	0	0	0					
Wanstead ...	4	1	0	0					
Witham ...	2	0	0	0					
Wivenhoe ...	3	0	0	0					
Woodford ...	4	1	0	0					
Totals ...	445	78	37	19	Totals ...	143	24	5	2

BARKING. The cases (16) were very few, but the fatality (25 per cent.) was the highest recorded. "Several of the cases were probably traceable to eating infected shell-fish."

BURNHAM-ON-CROUCH. Dr. Downman relates the measures taken during the last six years to exclude from the sewers the excreta of the eight cases which have occurred during that period, and concludes that no case "has in any way menaced the drainage of the town, so that I can with certainty say that all oysters in the Burnham river are and have been for the last six years absolutely free from Typhoid bacillus."

CLACTON. Five cases occurred, of which three were probably due to oysters, and a fourth to the use of infected army blankets from South Africa.

COLCHESTER. Out of seventeen cases four were traced to cockles, none to oysters.

EAST HAM. The disease has been of a severe type (case mortality 22·7 per cent.) but the cases have been fewer than in recent years. Origin from presumably contaminated water is described in the case of three young men who, after drinking of a watercourse in a hop field, were all attacked within a few days of each other, though living in different parts of East Ham.

GRAYS. Out of the 18 cases seven were traceable to a former case in the same house. "This proves the importance of removing all persons living in small houses who are affected with the disease to hospital."

HARWICH. Twenty-one cases occurred here, the great majority in one street, and seven in the first house involved, where an undetected case had occurred. This house was converted into a temporary hospital, and the accommodation at the isolation hospital reserved for cases from other houses. Several of the patients admitted having eaten shell-fish picked upon the mud of the foreshore. Samples of such shell-fish proved on examination to be polluted with sewage micro-organisms, and warning notices against their consumption were circulated.

ILFORD. "There was a marked absence during the year of any case giving a history pointing to infection from eating shell-fish."

LEIGH. Thirteen cases occurred, with three deaths, as against 43 cases and four deaths in 1902. A history of possible infection through shell-fish was obtained in three cases. The cockling industry in Leigh and the measures taken to prevent contamination of the cockles are described. "No case of enteric fever occurring in Leigh or elsewhere has been traced to any Leigh cockles other than those which have been laid in the creek, which is obviously liable to gross contamination." A committee of the Council had recommended that this practice should be discontinued, and that the cockles should be laid on flats instead, but the present powers are found to be "inadequate not only to protect the public from the danger of contamination of shell-fish from sewage, but also to protect the shell-fish industry from damage by sewage contamination." Several of the Leigh cocklers have decided to obtain steamers in order to thoroughly cook, and so disinfect their cockles.

LOUGHTON. "There has only been one case of Typhoid Fever during the year, and it is satisfactory to note that this was occasioned by the eating of oysters out of the district."

SHOEBURYNESS. "In nearly all the (11) cases of Enteric Fever there was evidence of shell-fish having been consumed."

SOUTHEND. A large section of the report is devoted to this disease, especially in relation to shell-fish. The incidence is not much more than half of last year's, but is still greatly in excess of the County rate (Southend 1·85 and Essex ·67 cases per 1,000 population). The respective death-rates are ·30 for Southend and ·12 for Essex. Dr. Nash calculates that the death-rate is 80 times, and the incidence rate 150 times, as great amongst the shell-fish eaters as amongst non-eaters of shell-fish in Southend. He also notes a disproportionate incidence upon the occupants of new houses and upon adolescent and young adult males, which he explains by the greater shell-fish proclivities of the latter section of the population, and by the fact that the new houses (whose drainage is presumably in good order) are occupied largely by new comers to the town, who are less aware than the other inhabitants of the danger of

shell-fish of unknown origin. Inquiries have been made in all cases of notifiable disease of the habits of the patient as to shell-fish consumption, with the result that of the 69 Typhoid cases 57 had recently eaten shell-fish, and of the 187 cases of other disease only three had done so.

Another table gives the probable source of infection in the 65 genuine cases, as follows :—Shell-fish, 56 ; watercress 6 ; bad drainage 3.

Dr. Nash recommends that the sale of shell-fish derived from sources liable to contamination should be prohibited, and believes that if this were done the excessive incidence which Southend shares with other coast-towns of Essex would cease, and that a notable reduction in Typhoid Fever generally, and a moderate reduction in Diarrhœa, would ensue. The section concludes with a resumé and criticism of the fourth report of the Sewage Commission, which deals especially with the subject of shell-fish contamination.

WALTHAM HOLY CROSS. One of the two cases which occurred had eaten cockles, said to have been gathered at Southend, three weeks before the onset of the disease.

WALTHAMSTOW. A sudden increase in the number of cases occurred in September, followed by a sudden fall in November. The water supply during the months July-October was very unfavourably reported upon by the Council's analyst, and it is suggested that the excess of Typhoid (and of Diarrhœa) during the latter half of this period was partly due to excess of organic matter in the water consumed. "That a large number of Typhoids nursed at home are a source of danger to any district is well known, and 21 persons contracted the disease for want of removal of primary cases. This shows the need existing for proper provision for such cases at the Sanatorium."

Six cases (out of the total of 88) were supposed to be primarily and seven secondarily) due to the consumption of oysters.

WITHAM. One of the two cases which occurred was due to eating whelks.

CHELMSFORD (R). Of three cases notified, one was apparently due to the consumption of polluted whelks eleven days before the onset. No source of infection could be traced in the other two cases.

LEXDEN AND WINSTREE. Eight cases occurred, some very severe, but none fatal. Some of the cases were attributed, with much probability, in Dr. Cook's opinion, to the consumption of foreign oysters.

MALDON RURAL. Of ten notified cases, two were directly, and four others secondarily, due to shell-fish, the latter four being infected by the former.

ORSETT. Out of 28 notified cases, eight were believed to be caused by eating shell-fish, cockles or mussels from Leigh.

ROCHFORD. Numerous cases (at least nine) occurred after the consumption of cockles, and one or two after shrimps and winkles. No patient had eaten any oysters within the incubation period. "Many other cases were conveyed by personal infection. In spite of advice, warnings, and printed directions, relatives and others visit and live in the houses of patients (some of them wretched hovels), and so contract the disease. Indeed one case was the starting point of infection for eight cases. One of the patients in the series took the blankets from a sufferer's bed and used them on her own, with the inevitable result that she contracted the disease, and communicated it to her husband and a married couple living in the same house as herself." The lethargy shown as to the disposal of offending matter is noted, and the opinion expressed that it will continue until Elementary Hygiene is taught in the schools.

MEASLES AND WHOOPING COUGH.

TABLE XXIII.

Deaths per 1,000 population.

	Measles.		Whooping Cough.	
	1903.	Mean for 13 years, 1890-1902.	1903.	Mean for 13 years 1890-1902.
Urban Districts ...	·285	·324	·334	·365
Rural Districts ...	·082	·129	·217	·272
Administrative County ...	·229	·258	·302	·338
England and Wales ...	·27	·411	·27	·374

The death-rates from these diseases are smaller than the average rates recorded for the County, but considerably higher than in 1902.

Several reports refer to the question of notification of these diseases by school teachers and attendance officers now that the control of the schools is vested in the County Council and certain Urban District Councils. Arrangements for this purpose have been completed at Walthamstow and at Ilford.

The utility of compulsory notification of Measles under the Infectious Diseases' Notification Act is discussed in several reports, and at Waltham Holy Cross alone does any definite advantage appear to have been derived from it, the general feeling being that notification by school teachers, &c. is the preferable method of dealing with both diseases.

BRIGHTLINGSEA. There was a severe and extensive epidemic of Measles during the autumn. In the absence of notification the number of cases is unknown, but it is quite safe to say that every susceptible child had it.

COLCHESTER. Measles was prevalent in the schools during April and May. Lists of absentees were furnished daily, and the children visited, and if necessary excluded from school. The labour involved was very considerable, but the disease is believed to have been considerably limited. In Dr. Savages'

opinion some form of notification by school teachers of these diseases would be of great value in their control.

FRINTON. A mild outbreak of Measles occurred, almost entirely confined to school children. The disease is notifiable, but it was found practically impossible in many instances to isolate satisfactorily or for a sufficient time.

ILFORD. Arrangements have been made for the notification by teachers and attendance officers of suspected cases of Whooping-cough, &c. occurring in the schools. Measles has been a notifiable disease since 1896, and has cost the town £85 in notification fees during the past year. Notification appears to have had a beneficial effect on the death-rate, chiefly through its educational effect on the parents, but owing to the transference to the Council of the control of Education, the question arises whether the same procedure would not suffice in the case of Measles as of Whooping-cough and other minor infectious diseases. Though notifiable, it has not been possible to treat Measles on the same lines as other notifiable diseases as to isolation and disinfection owing to the great expense involved. The experience of Aberdeen, which has recently discarded notification after a twenty years' trial, is very striking. Here removal to hospital and disinfection were carried out as with other infectious diseases, but no diminution in the spread of the disease occurred.

WALTHAM HOLY CROSS. Measles and German Measles are notifiable. "On five distinct occasions Measles was introduced into the district from without, and on no one of these did the disease spread beyond the infected house; this is most satisfactory, and a strong point in favour of compulsory notification with its attendant supervision and quarantine; on the other hand it is a fact that a very great number of the younger inhabitants are protected by a previous attack."

An extensive outbreak of Whooping-cough, causing seven deaths, or a rate of 1.05 per 1,000, followed the school treats in July.

Dr. Damer Priest comments on the callous selfishness of parents, who, while strenuous in their efforts to avoid infection of their own children as soon as misfortune had befallen them, exhibited an utter disregard for the welfare of others. "There is no doubt that the moral effect of compulsory notification is great, and brings home to many for the first time that this or that disease . . . must not be deliberately concealed, made light of, or wantonly exposed."

WALTHAMSTOW. A weekly list of children absent from school through illness is furnished by the Superintendent of the Education Committee's School Attendance Department, and thus early intimation of Measles and Whooping-cough is given. An infants' school, which was proved to be spreading the infection of Measles by the fact that another in the neighbourhood was free, was closed—a step seldom found to be desirable in Walthamstow for Measles. The appointment of a lady Health Visitor is recommended with a view to combating these diseases.

WANSTEAD. The schools were closed in February, owing to the number of absentees from Measles.

WOODFORD. Dr. Groves has not found compulsory notification of any service in preventing the spread of the disease. The Infant Department of one of the schools was closed for a month on account of an outbreak.

EPPING (R.) An epidemic of Measles at Chigwell Row necessitated the closure of the schools there for three weeks. Whooping-cough caused more deaths in this district than the whole of the notifiable diseases together. It was more or less prevalent throughout the entire year.

MALDON (R.) The schools at Cold Norton and Stow Maries were each closed for about three weeks on account of Measles. Compulsory notification by the parents of any apparently infectious disease associated with a rash or eruption of any kind is advocated, in order to prevent the sufferers from being allowed to play with other children, as at present.

ROMFORD (R.) Measles prevailed extensively in various parts of the district, and caused seven deaths, being disseminated chiefly through school attendance.

DIARRHOEA.

TABLE XXIV.

Deaths from Diarrhoea per 1,000 population.

	1903.	1902.	12 years, 1890-1901.
Urban Districts	·40	·33	·84
Rural Districts	·14	·16	·39
Administrative County ...	·33	·28	·63
England and Wales ...	·50	·38	·72

The effect of a cool and wet summer in lessening the mortality amongst children from Diarrhoea is well illustrated by the death-rates for 1902 and 1903 when compared with those for the years immediately preceding. The rate for the Administrative County in 1901 was ·82.

The subject has already been referred to under the heading of "Infantile Mortality."

A serious epidemic of Diarrhoea occurred in Chelmsford during the summer. About 1,400 persons were attacked and 14 deaths resulted. The outbreak coincided with the pollution of the water in a reservoir during the heavy rainfall of July. The onset occurred suddenly about two or three days after the water became polluted and ceased as suddenly when the reservoir ceased to be used. A full account of the outbreak is contained in my report to the Chelmsford Rural District Council.

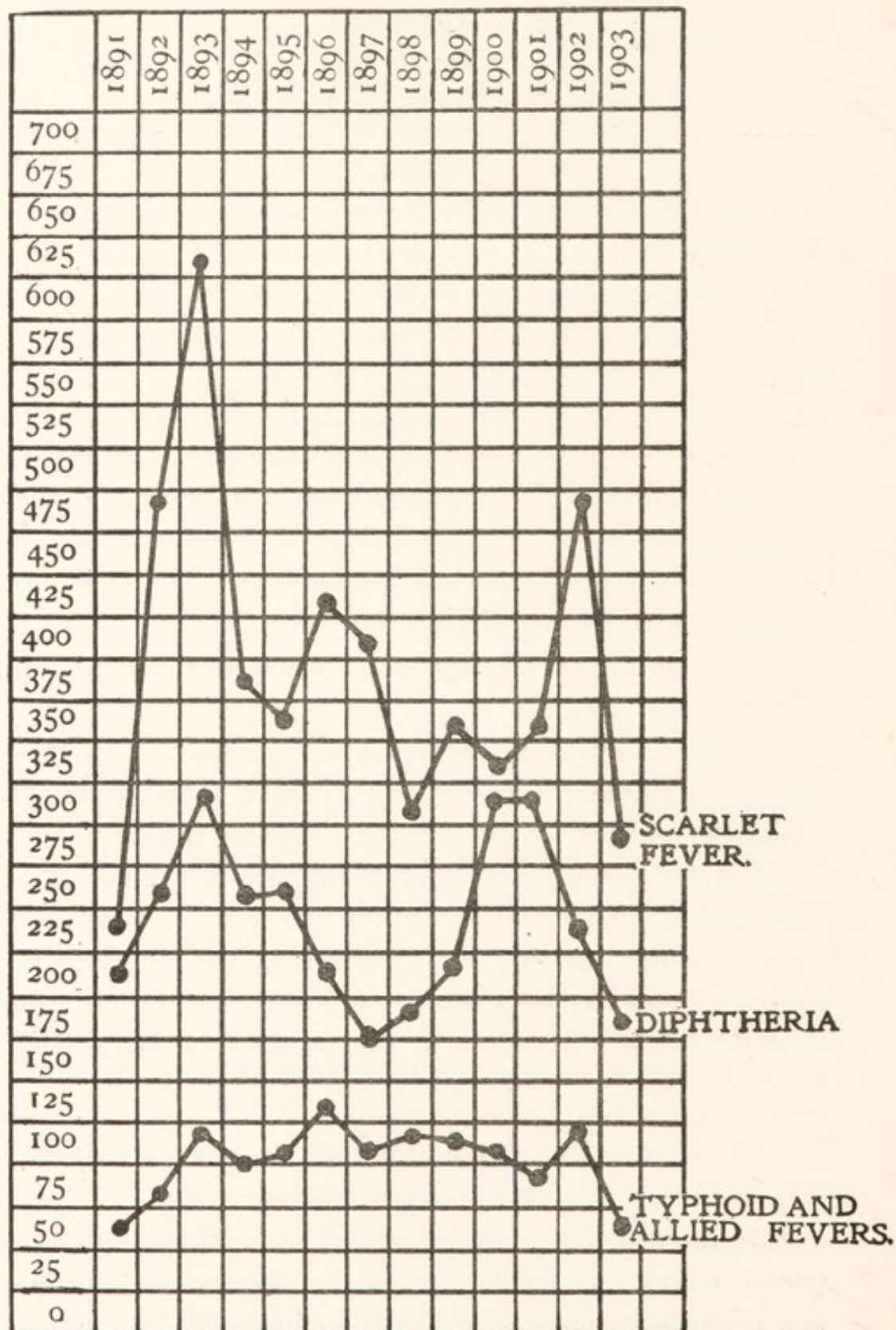
ISOLATION HOSPITALS AND THE EXTENT TO WHICH THEY ARE UTILISED.

In the districts having hospital accommodation the proportion of cases of Small-pox, Scarlet Fever, Typhoid Fever, and Diphtheria removed for isolation has varied from none in

Prevalence of Infectious Diseases.

CHART.

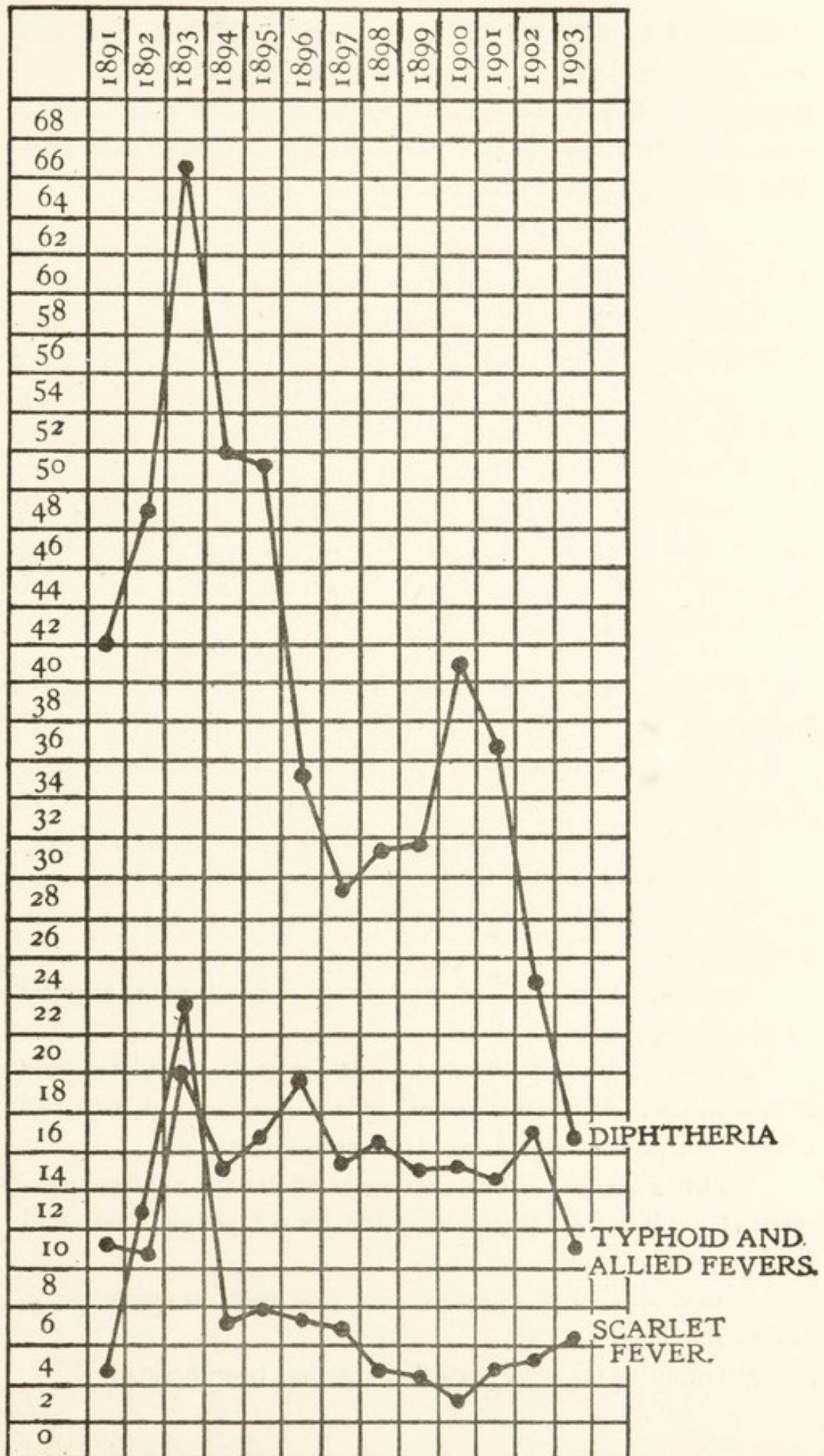
Cases per 100,000 Population.



Deaths from Infectious Diseases.

CHART.

Deaths per 100,000 Population.



Brentwood to 100 per cent. in Braintree Urban, but only two cases occurred during the year in Braintree; the next highest is Saffron Walden with 96 per cent. The average is about 50 per cent. In all cases where hospitals have been provided they appear to be fully utilized.

The following districts have no fixed hospital accommodation :—Brightlingsea, Frinton, Leigh, Waltham, Walton, Witham, Wivenhoe, Belchamp, Bumpstead, Dunmow, Lexden and Winstree, Ongar and Tendring. Several other districts have merely temporary arrangements, whereby their cases are admitted into the hospital owned by an adjacent authority. These are Brentwood, Buckhurst Hill, Chingford, Loughton, and Woodford. Waltham, Buckhurst Hill and Chingford are providing a Joint Hospital, plans for which have recently been approved. Burnham has provided a cottage, which appears to have been used for one case only.

The following improvements have been effected during the year :—

BARKING. A new ward block erected and additional land obtained.

CLACTON. A new ward block for 10 beds is being erected.

COLCHESTER. The Local Government Board has sanctioned a loan of £2,960 for the improvement of the existing hospital.

LEYTON. Land for the erection of a permanent hospital has been acquired.

MALDON JOINT HOSPITAL. This has been completed and is now in use. It is an excellent small hospital. A site has been obtained and fenced in for a Small-pox hospital.

WALTHAMSTOW. Plans have been prepared for the enlargement of the hospital by adding wards for 12 acute cases, and for 24 convalescents.

WANSTEAD. The hospital here has been re-constructed during the year.

BILLERICAY (R.) A porter's lodge has been erected.

BRAINTREE JOINT HOSPITAL. Land has been acquired at Black Notley for a Small-pox hospital.

HALSTEAD (R.) Some new fencing has been erected and certain alterations effected.

METEOROLOGY AND THE PREVALENCE OF DISEASE.

The year 1903 was remarkable for the excessive rainfall, for the unusually small amount of infectious sickness, and the phenomenally low death-rate. There is probably some connection between the former and the two latter.

The summer was wet and cold, whilst the winter months were comparatively mild. The heavy rainfall prevented the formation of much dust, kept the soil temperature low, continuously flushed drains and sewers, and in all these ways tended to produce conditions favourable to health. The mild winter prevented any excessive mortality amongst the very young and very old.

There is no doubt the meteorological conditions were such as to account for the exceedingly low mortality, notwithstanding that in many localities floods caused great distress. In many areas the water entered the houses, and for a time rendered them very damp and possibly unhealthy.

The low death-rate recorded this year cannot be maintained, however favourable the meteorological conditions may be in the coming years. (*Vide* also page 18.)

TABLE XXV.

MONTHLY RAINFALL (IN INCHES) AT VARIOUS STATIONS IN ESSEX.

	Waltham Abbey.	Orsett	Southend	Billericay	Barking	Shenfield	Buckhurst Hill	Chelmsford	Terling	Halstead	Clacton	Saffron Walden	Sutton	Fpping	Leyton	Lexden
January	1.80	1.84	1.85	2.36	1.90	2.11	1.32	1.805	1.95	1.50	1.75	2.05	1.83	1.80	1.90	1.77
February	.70	1.07	1.12	.86	.99	.75	.61	.82	.72	.45	.76	.61	.88	.69	.70	.45
March	2.35	1.36	1.36	1.74	1.92	2.14	2.23	2.025	1.94	1.77	1.44	2.27	1.41	2.49	1.89	1.32
April	1.20	1.85	1.74	1.71	1.52	1.83	1.37	1.765	1.80	1.88	2.02	1.86	1.31	1.61	1.88	1.88
May	2.29	1.68	2.22	1.88	1.66	1.97	2.27	1.74	2.65	2.93	2.53	3.36	2.33	2.45	1.52	3.35
June	6.13	5.81	5.87	6.99	6.00	6.36	5.94	5.965	4.91	3.24	2.62	5.27	5.83	6.73	5.86	3.16
July	5.69	5.56	4.86	6.12	6.60	7.32	7.96	5.475	4.29	3.88	4.26	4.38	6.34	4.97	5.45	3.90
August	4.12	2.92	2.60	3.49	3.56	4.13	4.18	4.375	3.61	3.12	3.39	3.48	4.76	4.67	3.4	3.87
September	2.70	1.78	1.52	2.26	1.99	2.33	2.70	2.205	1.99	2.08	1.44	3.38	1.56	2.76	2.47	2.04
October	5.62	4.33	4.55	5.35	3.69	5.63	6.63	4.77	4.99	4.09	3.44	5.20	4.34	6.31	5.71	5.01
November	2.16	2.21	2.85	2.44	2.18	2.68	1.71	1.945	1.87	1.65	2.18	2.04	2.62	2.08	1.44	1.98
December	1.49	1.33	1.12	1.42	1.15	1.63	1.11	1.465	1.24	1.22	.66	1.37	1.07	1.48	1.00	1.20
Total for year	36.25	31.74	31.66	36.62	33.16	38.88	38.03	34.355	31.96	27.81	26.49	35.27	34.28	33.04	33.66	29.93
Average for last years	22.85 9	20.36 10	20.73 9	24.89 4	21.34 7	23.59 7	26.16 3	22.35 23	23.54 10	21.84 11	19.39 3	25.21 29	22.65 3	—	—	—
Observer	Dr. Damer-Priest.	W. Powell	C. S. Bilham	B. Tabrum	T. Booton	Canon Quennell	Dr. Gimblett	Dr. Thresh	Rev. H. C. Bouthflower	E. T. Adams	A. W. Shadick	Ald. Leverett	Rev. James Montagu	H. W. Hart	W. B. Bryan	S. F. Hurnard

TABLE XXVI.
METEOROLOGICAL DATA AND PREVALENCE OF INFECTIOUS DISEASES
For the Year ending December 31st, 1903.

Month.	METEOROLOGICAL DATA.					INFECTIOUS DISEASES NOTIFIED.					TOTAL.
	Mean Temperature.	Mean Daily Range.	Relative Humidity	No. of Rainy Days.	Rainfall.	Small-pox.	Diphtheria and Group.	Fevers.	Scarlet Fever.	Erysipelas.	
January...	39.6	9.8	89.5	16	1.805	1	164	47	227	72	511
February...	40.7	19.75	83.5	9	.820	2	193	22	218	50	485
March...	45.0	15.1	77	19	2.025	21	157	26	268	72	544
April...	41.35	20.09	73	12	1.765	22	87	31	195	52	387
May...	51.9	19.7	72.5	14	1.740	27	101	22	171	55	376
June...	54.6	18.9	72.5	9	5.965	20	96	22	170	60	368
July...	60.25	17.8	70.3	15	5.475	2	89	33	235	70	429
August...	58.6	17.7	75	17	4.375	1	118	54	199	69	441
September...	56.5	17.6	82	13	2.265	0	161	127	190	58	536
October...	51.7	12.5	87	23	4.770	0	169	162	199	63	593
November...	43.3	11.9	87.5	10	1.945	1	132	73	210	57	473
December...	37.4	8.1	90	11	1.465	0	173	44	223	56	496
Totals and Means ...	48.4	15.75	79.98	168	34.355	97	1640	663	2505	734	5639

SECTION III.

SANITARY ADMINISTRATION.

In last year's report special reference was made to the Housing of the Working Classes and Overcrowding, and in previous reports the question of Water Supply has received special attention. In the present report I do not therefore propose referring specially to these subjects; abstracts thereon will be found in the summary of the various Medical Officers' report.

SYSTEMS OF SEWAGE DISPOSAL.

The question of Sewage Disposal is at present one of considerable importance, and committees are journeying up and down the country to see special systems of sewage treatment, apparently unaware of the fact that similar systems are in use in the County. I have therefore decided to give a description of all the works of any interest in the County, and for much of the information I am indebted to the courtesy of the Surveyors of the various districts. Many of these works give fairly satisfactory results, but doubtless it will be found in time that all admit of considerable improvement. The bacteriological methods of treatment give far better results than chemical or precipitation methods, but the best bacteriological process cannot give results so good as can be obtained by proper treatment on land, *i.e.*, by broad irrigation. Within the last few weeks, however, the results of an experimental treatment carried out at Hanley (Staffs.), has been published by Dr. Reed, the Medical Officer of Health for the County, showing that by the proper application of the sewage to bacteria beds, a very high degree of purification can be obtained. Experiments on similar lines are being carried out at Buckhurst Hill by Mr. Tooley and myself, but as yet our results do not equal those

obtained at Hanley. The sewage at Buckhurst Hill is apparently stronger than that at Hanley, and this may account for some of the difference in the results.

The method of sewage disposal in use in the County may be classified as under:—

1. Simply discharged in crude state into the sea or tidal river.

Shoeburyness, Southend, Wivenhoe, Harwich, Maldon, Manningtree, Clacton, Frinton and Rochford.

2. Sewage discharged into sea or tidal river after passing through a septic tank.

Walton, Parkeston.

3. Sewage submitted to some kind of chemical precipitation.

Saffron Walden, Leyton, East Ham, Barking, Brightlingsea.

4. Sewage submitted to some form of bacterial treatment.

Brentwood, Buckhurst Hill, Burnham, Chingford, Colchester, Grays, Ilford, Leigh, Loughton, Waltham, Wanstead, Woodford, Tollesbury (Maldon R.), Hornchurch, Warley and Upminster (Romford R.), Writtle (Chelmsford R.)

5. Sewage purified by irrigation on land.

Braintree, Chelmsford, Epping, Halstead, Romford, Walthamstow, Witham; Ingatestone, (Chelmsford R.), Tillingham and Tolleshunt D'Arcy (Maldon R.), Ongar and Abridge (Ongar R.), Stansted.

Urban Districts.

Barking. The works in this district deal with the sewage from a population of about 20,000, with 1 brewery, 1 mineral water manufactory, and 1 rubber factory, and are situated within the district, adjacent to Barking Creek. The area of the land available is $8\frac{1}{2}$ acres, of which the precipitating tanks take

up about $\frac{1}{2}$ an acre, and the sludge beds $1\frac{1}{2}$ acres. The dry weather flow of sewage is about $\frac{3}{4}$ -million gallons daily, but there are no recent records of the average daily flow. With the exception of one or two roads in the old portion of the town, the sewers are on the separate system. The sewage from the greater portion of the district is conveyed to the works by gravitation, but that from two low-lying portions, viz., the Kennedy Estate and Over-the-Gates, is raised by Shone's Pneumatic Ejectors worked by electrically driven air compressors. The method of treatment adopted is that of precipitation, the chemical used being Spence's alumino-ferrie, slabs of which are placed in the flow of the sewage in the manholes at the works, so that each gallon dissolves five or six grains. The sewage then flows into precipitating tanks, of which there are three, each being of a capacity of $\frac{1}{4}$ -million gallons. The effluent from these tanks undergoes no further treatment, being discharged into Barking Creek. The sludge is pumped from the precipitating tanks into sludge beds, where it is allowed to dry; when sufficiently hard it is dug out and as often as possible removed from the works, 9d. per load having of late to be paid for its removal. The total working expenses of the sewage works average about £1,700 per annum, while the cost of chemicals averages about £100 per annum.

Braintree. The sewage from this district, with a population connected with the sewers of 5,300 and 2 breweries, is treated by irrigation upon an area of land 14 acres in extent, situated in the parish of Black Notley. The land, which is not under-drained and which has a subsoil of gravel and sand, has been in use for this purpose for 34 years. The estimated dry weather flow is 142,000 gallons, while the average daily flow is about 195,000 gallons. All surface water from yards, roofs, etc., passes into the sewers, to which are also connected about two-thirds of the road gullies. The sewage passes into subsidence tanks, where all the heavier solid matters are deposited; it is then pumped by a 6in. double-barrel plunger pump on to the

land along ploughed furrows. There are no special arrangements for dealing with storm waters. The whole area of the land is cultivated, the crops being mangels, cabbage and oats. The net cost of the works last year was £206. The area of land is insufficient for present day requirements, and the Council are considering the question of dealing with part of the sewage by the bacterial method of treatment, or as an alternative of extending the area of land available.

Brentwood. The sewage works are situated near Harold Wood, partly in the parish of Upminster and partly in that of South Weald. The total area of the land in occupation is 31 acres 2 roods 13 poles ; of this, the works themselves occupy $3\frac{1}{2}$ acres, while the remainder is farm land.

In 1901 it was estimated that the population draining to the works was 10,000 and the dry weather flow was thought to be 250,000 gallons per diem, this allowing 25 gallons per head ; until recent years no attempt has been made to prevent rain and surface water from flowing into the ordinary sewers, which consequently receive the greater proportion of the water from roads, yards, etc.

The sewage is not pumped but reaches the works with a very considerable head by two iron mains ; one of the mains delivers to the top of a water wheel and the other to the bottom, the energy thus obtained being sufficient to work the lime-mixing machinery. Buxton lime having been added in the proportion of about 12 grains per gallon, the sewage is passed into a precipitation tank and thence into a secondary subsidence tank ; each of these tanks is duplicated and they can either be used simultaneously or one of each can be emptied and cleaned while the others remain in use ; the total superficial area of the tanks is 630 square yards, and they have an average depth of $6\frac{1}{2}$ feet.

The sludge passes to a sludge well, with which are connected wash-out drains from each of the tanks ; it is thence discharged to a number of draining beds, where it slowly dries,

and as soon as it can be handled is carted away, some to be ploughed in on the sewage farm and some to other farms in the neighbourhood.

The effluent from the secondary tanks is said to be practically free from solid matter in suspension ; during the summer a considerable proportion of the tank effluent is run over grass land or over osier beds and thence ultimately into the Ingrebourne River, which is at a little distance from the works. The bulk of the effluent, however, is pumped to the adjoining works, where it undergoes bacterial treatment before being discharged into the river.

At the bacterial works there are duplicate septic tanks with ventilated covers, each having a capacity of about 20,000 gallons ; these tanks, however, are not in constant use, being provided merely to relieve the other works in case of emergency. In general, the effluent from the lime treatment works passes through a glazed stoneware carrier, which communicates with each of three primary filter beds, over one of which the effluent is discharged by means of creosoted wooden troughs ; from the primary beds the effluent passes to one of the three secondary beds, over which it is discharged by means of Adam's Patent Automatic Syphons, being distributed by wooden troughs similar to those on the primary beds.

Each of the beds has an area of 350 square yards, being filled to an average depth of 3 feet partly with burnt ballast and partly with furnace clinkers ; as the beds are used in rotation, there is no difficulty in giving them periodic rest.

The effluent from the secondary beds can be discharged into a watercourse which runs directly down to the river, or can be directed so as to pass over grass land first.

There is no special arrangement for treating storm waters.

Brightlingsea. In this district the treated sewage from a population of 4,640 is discharged into the sea by means of one outfall situate at West Marsh Point, 110 feet from the shore but above the low-water work. The position was selected

for the outfall after float experiments, which as confirmed by those of Dr. Bulstrode demonstrated that the sewage effluent was conveyed out to sea by the currents and tides; the outlet is 250 feet from the nearest shellfish laying. The sewage flows by gravitation from the sewers into a precipitation tank capable of holding 216,000 gallons, where it undergoes treatment with alumino-ferrie; the sludge is then carried on the land, while the effluent is discharged into the sea during ebb tide only, the valve being opened one hour after high water and closed one hour before low water. There is a storage tank capable of holding 100,000 gallons.

Buckhurst Hill. The experimental contact beds, which form part of the works, were made at the end of 1898. The system of contact beds were completed in December, 1902. A Candy Whitaker sprinkler was fitted to one of the beds in September, 1903, to enable a comparison to be made between the principle of contact beds and sprinkler beds.

The works are situated on the banks of the River Roding in the Urban District of Buckhurst Hill; the land for irrigation is $14\frac{1}{2}$ acres in extent, and is situated upon the opposite side of the river in the parish of Chigwell. The population connected with the sewers is about 4,200; there are no manufactories or breweries. The average amount of sewage treated daily is 57,500 gallons; this is the average of twenty gaugings taken in April and May, 1899, and is confirmed by a series of gaugings taken each month throughout 1896, and by many other gaugings taken at irregular intervals (during 1903 the average flow, undoubtedly due to the extremely wet weather, has been much greater), since the hourly flow varies daily from 550 gallons per hour at 1 a.m. to about 6,000 gallons per hour at 10 a.m.

The sewers are all on the combined system, *i.e.*, no attempt is made to divert the rainfall from roads, yards, roofs, etc.

The sewage reaches the works by gravitation and first passes through a detritus chamber of 400 gallons capacity;

the sand, &c., from this is removed almost daily. The sewage thence flows into two open tanks of 10,000 gallons capacity each; these have to be cleaned out once in three months. Considerable septic action takes place in these tanks, but by the time the three months is expired they are about half full of sludge and scum; the sludge and scum are run by gravitation into shallow pits and when partially dried are carted away under contract by a farmer. Nothing is paid for the sludge by him, or by the Council for the carting away.

The bacteria beds are made up as under:—

COARSE BEDS.

No. of Bed.	Capacity in gallons calculated at one-third gross.	Area in feet.	Depth.	Material.	Remarks.
1	8,000	640	6ft. 0in.	Practically any hard rubbish available, chiefly cinders and broken crockery sifted out of house refuse burnt in heaps.	Results have been equal to the more carefully prepared beds, but the beds shows a greater tendency to clog.
2	8,000	640	6ft. 0in.	Broken bricks and burnt ballast.	
3	8,000	640	6ft. 0in.	Thoroughly well burnt ballast.	Appears to be quite equal to the clinker beds.
4	3,000	580	2ft. 6in.	Clinkers rejected by lin. sieve.	An old bed converted.
5	18,250	1,460	6ft. 0in.	Do.	New bed.
6	18,250	1,460	6ft. 0in.	Do.	Do.
7	18,250	1,752	5ft. 0in.	Do.	Do.
8	18,250	1,752	5ft. 0in.	Do.	Do.

Total...100,000 ... 8,924 = 991 $\frac{5}{8}$ yards.

FINE BEDS.

No. of Bed.	Capacity in gallons calculated at one-third gross.	Area in feet.	Depth.	Material.	Remarks.
1	12,000	1,200	4ft. 9in.	Burnt ballast and clinker.	Old beds converted.
2	12,000	1,200	4ft. 9in.	Clinkers.	
3	12,000	1,200	4ft. 9in.	Do.	
4	12,000	1,200	4ft. 9in.	Do.	
5	17,333	2,080	4ft. 0in.	Do.	New beds.
6	17,333	2,080	4ft. 0in.	Do.	
7	17,334	2,080	4ft. 0in.	Do.	
					This has now been fitted with a Candy Whitaker sprinkler.

Totals... 100,000 ... 11,040 = 1,226 $\frac{2}{3}$ yards.

The whole of the coarse beds, except No. 4, are simply holes dug in the stiff clay subsoil, and fitted with the necessary valves, distributing chambers, &c. The fine beds Nos. 5, 6 and 7 are similarly constructed. Nos. 1 to 4 are old beds, with brick walls and floors, adapted for the contact system.

No attempt is made to distribute the sewage over the contact beds; a simple trough from outlet to near the centre of the bed is used, and is shifted from time to time. No. 7 fine bed has been fitted with a Candy Whitaker sprinkler.

The ordinary working of the beds has been sufficient to keep them active; none of the material has had to be re-placed.

The effluent from the secondary beds is distributed over 14 $\frac{1}{2}$ acres of land.

The works dealing with the storm water consist of a reservoir and filter of 250,000 gallons capacity; this consists of a burnt ballast filter about 1ft. 6in. deep, surrounded with earth banks; the outlet drain is only 6in. diameter, so that in times of storm the water collects more quickly than it can flow away until it reaches an overflow wier, over which it goes direct to the

river; before this happens, however, the dilution is much greater than 5 to 1.

The effluent from this reservoir and filter is again filtered through a burnt ballast filter 540 square yards in area, and 2ft. 6in. deep, before it passes to the river.

The overflow from the sewer is governed by an automatic contrivance which allows three times the ordinary flow for any particular time of the day to pass to the works, and diverts the remainder to the storm bed, *i.e.*, at 1 a.m. any flow in excess of 1,650 gallons per hour is diverted to the storm bed, whilst at 10 a.m. any flow in excess of 18,000 gallons is so diverted.

Considerable deposit is left on the surface of the reservoir and filter No. 1, and has to be periodically removed; this year the amount has of course been exceptional.

In dry weather the land absorbs the whole of the effluent—in wet weather the greater part flows off the land into the river.

A series of experiments have been carried out at these works with the assistance of Dr. Thresh, who has made all the necessary analyses.

The Surveyor has been considerably disappointed in the amount of purification obtained by the fine beds; in the first experimental fine bed 50 per cent. or more purification of the impurities left after treatment in the coarse beds was constantly obtained but seldom was reached in the fine beds of the completed set. He has not been able to find any satisfactory reason for this; the coarse beds have given results fully equal to those obtained in the experimental beds. Since fixing the sprinkler the results have been far more favourable. A series of 16 samples extending over a period from December 13th, 1902, to May 16th, 1903, gives the average results shown in Table A below; those entered in the second column were average samples of a whole day's flow, whilst those in the first were obtained by following a certain amount of sewage through the works, *i.e.*, samples were taken as a primary was being filled, then as that primary was being discharged into a

		TABLE A.		TABLE B.		TABLE C.
		Average of 16 samples taken between Dec. 13, 1902 and May 16, 1903.		Average of 7 samples taken between Sept. 22, 1903 and Dec. 16, 1903.		Average of 2 samples taken on Jan. 5 and 21, 1904.
		<i>Special.</i>	<i>Average.</i>	<i>Sprinkler</i>	<i>Contact.</i>	<i>Sprinkler acting on tank effluent.</i>
Chlorine.	Sewage ...	10.52	10.52	7.25	7.25	9.70
	Tank effluent ...	9.00	9.73	7.76	7.76	8.35
	Primary ,, ...	8.65	9.13	7.35	7.35	
	Secondary effluent ...	8.58	8.75	6.95	7.07	7.90
Nitrogen in Nitrates.	Sewage ...	.00	.00	.00	.00	Traces.
	Tank effluent ...	.02	.02	.00	.00	.10
	Primary ,, ...	.19	.10	.26	.26	
	Secondary effluent ..	1.10	.80	2.52	1.03	1.37
Free Ammonia.	Sewage ...	5.53	5.53	3.61	3.61	6.30
	Tank effluent ...	5.61	5.25	3.27	3.27	5.72
	Primary ,, ...	3.86	3.67	2.99	2.99	
	Secondary effluent ...	2.65	2.31	.44	2.09	1.41
Organic Ammonia.	Sewage ...	1.38	1.38	1.22	1.22	1.26
	Tank effluent ...	.76	.73	.58	.58	1.02
	Primary ,, ...	.30	.29	.27	.27	
	Secondary effluent ...	.14	.13	.07	.19	.13
Oxygen absorbed.	Sewage ...	8.74	8.74	4.24	4.24	6.80
	Tank effluent ...	3.83	3.74	3.02	3.02	4.60
	Primary ,, ...	1.48	1.57	1.58	1.58	
	Secondary effluent ...	1.18	1.06	.73	1.37	1.40
Turbidity.	Sewage ...	182	182	55	55	90
	Tank effluent ...	47	50	37	37	66
	Primary ,, ...	15	18	15	15	64
	Secondary effluent ...	9	8	4	8	11
Total percentage improvement	Suspended matter removed ...		90	93	84	90
	Free ammonia ...		55	88	38	77
	Organic matter ...		84	89	72	82

secondary, and then as that secondary was being discharged, great care being taken to take the samples in proportion to the flow at the time. Since the sprinkler has been fixed a series of seven samples has been taken to compare its work with the contact beds, and the analytical results are shewn in Table B. Care was taken that each of the beds to be compared had a fair share of work daily, previous to the samples being taken, and at the time the samples were taken the flow from the primaries was diverted half to the sprinkler and half to the contact bed, so that there is no question but that the comparison, which shows a result very favourable to the sprinkler, is a fair one; in one way the comparison is unfair to the sprinkler as the latter has been fixed upon a bed prepared for the contact method, and has, therefore, been filled with a finer material than is found most suitable for the sprinkler; moreover if it had been constructed for that sprinkler, instead of being enclosed all round, it would have been built up above the level of the surrounding land and would have, in consequence, been better aerated.

Two samples were taken of the effluent obtained by passing the sewage issuing from the tanks on to the sprinkler bed without its passing over a primary bed; the results of the analysis are shewn in the Table C.

The capital expenditure upon the works has been as follows :—

New beds and adaptation of old and	£
storm water disposal works ...	1,420
Bridge over Roding ...	70
Fences ...	240
Carriers across river and on land, and	
subsoil drainage, &c. ...	220
	<hr/>
Total ...	£1,950
	<hr/>

The cost of the works during the current financial year (estimating the amount from March) has been as follows:—

			£	s.	d.
Manual labour	...	...	135	0	0
Rent of land	...	...	55	0	0
Preparing and sowing part of field			13	2	6
Rates and taxes	...	...	17	11	0
Sundries	...	...	11	0	6
			<hr/>		
			231	14	0
Less amount received for crops			17	0	0
			<hr/>		
			£214	14	0
			<hr/>		

The cost of manual labour upon the beds themselves does not exceed £62; the exceptional rain and floods have caused considerable extra expense this year, the floods having damaged the carriers on the land, and the rains having caused the storm overflow to be at work an abnormal number of times, the cost of clearing the sediment from the first storm bed has been much more than it will be on the average.

The crops also suffered very materially; they were looking well until June 26th, and under ordinary circumstances the credit on that account should have been at least trebled. Of course the labour on the land will vary greatly, according to the crops which may be grown.

Burnham-on-Crouch. The sewage works are situated half a mile east of the town, and have been in operation for the last $2\frac{1}{2}$ years. The population connected with the sewers is about 2,800, and there is one small brewery. The average daily flow is estimated to be about 40,000 gallons. No attempt is made to exclude from the sewers surface water from yards, roads, etc. After passing through a coarse strainer, the sewage flows by gravitation into an open tank 5ft. in depth, and 42ft. by $14\frac{1}{2}$ ft. in area. From the tank it is pumped, by means of a centrifugal pump worked by a 6 h.p. oil engine, on to a bed,

60ft. by 30ft. by 3ft. in dimensions, filled with coarse clinker ; it thence passes through a secondary bed, sunk in the ground, of same dimensions, but filled with fine breeze. The effluent is discharged by means of a pipe into a ditch half a mile from the works, and ultimately enters the river through a sluice. The method of working the beds, each of which is duplicated, is as follows :—

The sewage is distributed over the top of the beds, which, when full, are allowed to stand for two hours and are then drawn off ; by this means a day's sewage can be disposed of in three fillings. For dealing with storm waters a storm bed, 80ft. by 50ft. by 3ft. in dimensions, is provided, filled with ungraded clinkers.

At irregular intervals the coke beds are forked over, this being the only attention the filters are now found to require. Prior to the provision of the open septic tank the sewage was delivered directly upon the coarse filter beds, but this was found to result in the latter becoming clogged with the solid matter of the sewage and with silt from the roads.

The total cost of the works was only £1,100, the old precipitating tanks having been converted into an open septic tank ; the annual cost of working is £40 10s., including oil for power, while the cost of labour is £83.

Since the provision of the septic tank the arrangements have apparently worked satisfactorily ; occasionally a little difficulty is experienced at times of heavy rains by the storm waters breaking away some of the scum on the surface of the tank and carrying it on to the coarse filter. The Surveyor is of opinion that the filtering material will not require renewing for a long time, the only trouble being its tendency to disintegrate and become converted into an impervious mass.

Borough of Chelmsford. The sewage from the Borough of Chelmsford, together with that from three populous parishes in the Chelmsford Rural District, is disposed of on a sewage farm situate at Brook End in the parish of Springfield, which

has been in use for this purpose for the last 23 years. The population connected with the sewers in each parish is as follows :—

Chelmsford	...	12,000 and 1 large brewery
Springfield	...	2,000 and 1 large brewery
Great Baddow	...	1,200 and 1 tannery
Widford	...	300

giving a total population of 15,500. The dry weather flow is estimated to be about 310,000 gallons ; there are a few surface water drains in the Borough, but a large proportion of the surface water from streets, yards, etc., finds its way into the sewers. The area of the farm is 108 acres. The soil is brick earth for a depth of three or four feet resting on gravel. A small portion of the land is underdrained at a depth of about two and a half feet.

The sewage flows by gravitation into settling tanks, where the heavier solid matters subside ; it then flows along earthenware pipe drains to the various beds. Nineteen acres are devoted to rye grass, 34 to grass, 11 are arable, while the remainder is permanent grass land. The crops grown are osiers, celery, kale, savoys, and general market produce. There is no special arrangement for dealing with storm waters, which are generally distributed over the rye grass plots.

The effluent from the sewage farm passes into the Chelmer Canal, and does not apparently cause any nuisance.

The annual expenditure and receipts for the last three years are shown below :—

		Expenditure.			Receipts.
1901	..	£1,321	5	0	£870 12 10
1902	...	£1,061	17	10	£1,027 17 6
1903	...	£970	10	6	£894 19 10

Chingford. The sewage of this district, with a population of about 5,000, is disposed of at the sewage works situate near the boundary of Chingford and Walthamstow. The area is 13 acres in extent and has been in use for the last five years. The

average daily flow is estimated to be 151,250 gallons; the Council now insist upon a separate drainage system for rain water wherever practicable.

The greater portion of the sewage flows by gravitation to the works, but that from a small low-lying district has to be pumped up from a pumping station at the foot of Mansfield Hill to the main sewer. The sewage, on arrival at the works, passes into three subsidence tanks, each 82ft. by 20ft. by $3\frac{1}{2}$ ft., where all the heavier solid matter settles; these tanks are cleaned out twice weekly. From the tanks the sewage is conveyed by means of non-automatic moveable carriers on to the bacteria beds; at present only two of these are in use, covering an area of 132 by 49 sq. feet and 100 by 40 sq. feet respectively, but a third, with an area of 100ft. by 50ft. has been constructed. The beds are forked over occasionally, and the material (burnt ballast) had to be renewed at the expiration of three years; the effluent from the filter beds, after passing over the land, discharges into the Ching Brook. There is no special arrangement for treating storm waters. The annual cost of maintenance of the works is about £70, while that of labour is £180.

Clacton-on-Sea. A population of about 10,000 is connected with the sewers, the whole of the urban district being sewered. The sewage, without preliminary treatment, is carried to sea by one outfall discharging 1,000 yards from the cliffs far below low watermark, at the extreme northern boundary of the district. By a series of float experiments it has been found that no floating matter discharged at this point came near to the shore close to the town, but passed southwards beyond the end of the pier. The outfall sewer passes through the cliffs in a tunnel and very occasionally, when the tides are unusually high, sewage has regurgitated from the eastern end of this tunnel near Valley Farm. There is no storage tank, the sewage being discharged continuously or occasionally being stored in the tunnel. The shops at the pier approach cannot drain into the public sewers and therefore discharge under the

pier; the Urban District Council are anxious to have the drainage of the pier approach altered.

Borough of Colchester. At Colchester, the sewage from a population of 40,000 with 3 breweries is treated by the bacterial method, which has been in use for the last twelve months.

The dry weather flow is estimated to be 950,000 gallons, while the average daily flow is 1,022,000 gallons; about 90 per cent. of the rain water discharges into the sewers, but the latter are much relieved by a large number of storm water overflows, most of which act at any state of the tide; this is the only provision made for dealing with storm waters.

After passing through a screening chamber the sewage enters tanks, of which there are six, with a total capacity of 1,500,000 gallons; the effluent from the tanks, having been raised by pumping, is distributed by open conduits laid on the surface of the breeze over the bacteria beds, six in number, each one-third of an acre in extent and four feet in depth, filled with pan breeze and clinker. The plunger pumps used are six in number and are capable of lifting 2,500,000 gallons daily. The effluent from the beds passes into the tidal part of the River Colne without further land treatment.

The maintenance of the works costs £950, while the cost of labour is £550 per annum. The expenditure in connection with the works in 1902-3 amounted to £10,000.

The arrangements work satisfactorily, the effluent being bright and inodorous.

East Ham. The sewage from the greater portion of the district is treated at the Council's sewage works, but that from a small portion of the district south of the Royal Albert Dock Railway passes into the London County Council's sewers.

The population connected with the East Ham sewers is about 100,000, and there are no manufactories or breweries. The average daily flow is about three million gallons; surface water from the roads and front roofs goes into separate sewers

and thence into the Havering and Dagenham Commissioners' ditches; surface water from back roofs and back yards discharges into the ordinary sewers.

The method of treatment adopted is chemical precipitation, 9 grains of lime and 4 to 5 grains of alumino-ferric (Gibbs' manufacture) being added per gallon. There are 5 precipitation tanks, 2 covered, each 155 by 24½ by 6⅔ c. ft. in size, and 3 open, each 198 by 50 by 6⅔ c. ft. in capacity.

The sewage, after reaching the works by gravitation, is pumped into the precipitating tanks by two centrifugal pumping engines, each capable of dealing with about 6 million gallons daily, but additional pumping plant is about to be put down to enable 30 million gallons to be dealt with per diem.

The sludge is at present pumped up into open "lagoons" and there mixed with the town refuse; it is now proposed to commence dealing with the sludge in sludge presses in the usual way.

The tank effluent is usually satisfactory, and when the new outfall to the river is completed will be delivered into the main stream of the Roding during the hours of ebb tide; at present it is discharged into the Commissioners' sewer or open water course.

The cost of the precipitants used per annum is £1,400, while the cost of labour, exclusive of pumping, is £1,592.

Epping. The peculiar configuration of this district prevents the sewage being all brought to any one point by gravitation, hence there are four different outfalls, at each of which the sewage, after passing through small settling tanks, is allowed to flow over land for purification.

At Cingfoil Farm the sewage of a population of about 700 flows through two open tanks, 14½ ft. square and 3 ft. deep, and then on to about three acres of land. Storm water overflows into the ditches, which bound two sides of the field. These ditches and the effluent draining from the land ultimately discharge

into Cobbins Brook, which is about a mile away. The total area of the field used is $6\frac{1}{8}$ acres.

At Berry Lane Farm the sewage from about 1,150 persons is treated. It first passes through two very small tanks, $4\frac{1}{2}$ by $3\frac{1}{2}$ by 4 ft., and then flows over the land, the area of which is about 27 acres, and the effluent is discharged into Cobbins Brook.

At Railfield Farm the sewage from about 1,150 persons is treated in an exactly similar manner as at Berry Lane Farm. The effluent enters Cobbins Brook.

At the Southern Farm, with an area of $28\frac{1}{4}$ acres, the sewage of about 1,000 persons is similarly treated. The effluent enters a tributary of the River Roding.

Rain water is not excluded from the sewers which terminate at the three first farms, but in the Southern district the rainfall is diverted from the sewers as far as possible. Most of the land is underdrained at a depth of three to four feet. Three of the irrigation areas are let to farmers, who grow wheat, oats, cabbages, mangold and rye grass.

The land is very heavy, hence the results are often far from satisfactory. The Council has decided to install a bacterial system at the Southern farm, and are considering the advisability of doing the same at the other farms.

The total cost of disposing of the whole of the sewage last year (1903) was £140 4s. 2d.

Frinton-on-Sea. The sewage from this district is discharged into the sea in a crude condition by means of one outfall 750 feet from high-water mark and 130 feet beyond low-water mark; at the end of the outlet there is a tidal flap, but there is no tank or other means of storage. The sewage is discharged by gravitation, and so far no complaints have been received of its causing pollution of adjacent shores; before the outfall was constructed in 1897, experiments were made in order to determine the best site possible. The population

connected with sewers is about 800—1,000 but in the summer months this is increased to about 3,000.

Grays. The sewage of Grays, Tilbury and Little Thurrock, with a population of 14,200 and 1 brewery, has been treated for the last 12 months by the bacterial method of purification. The works are situated in the S.E. portion of the district and cover an area of two acres. The dry weather flow is estimated to be 450,000 gallons, while the daily flow averages about 500,000 gallons; there is a separate system of drainage for the roads, but the rain from backyards, roofs, etc., enters the ordinary sewers.

The sewage from all three districts passes through screening chambers; that from Grays also passes through a detritus tank, which has a capacity of 50 cubic yards, and is cleaned out fortnightly. The septic tank is covered and has a capacity of 350,000 gallons; from the tank the sewage, having been raised 41 feet by plunger pumps, is distributed non-automatically by half-pipe channels over the filter beds, 6 feet in depth, filled with clinker and breeze, and having an area of 2,905 square feet; air is admitted to the beds through under drains composed of 9in. and 4in. pipes; the material has not had to be replaced or interfered with in any way except round the distributing channels where the overflow takes place. Of the six beds in use, two are made to act as second contact beds, the effluent therefrom being discharged into the Thames without further land treatment.

In times of storm the septic tank effluent is diverted from the bacteria beds and is passed over a wide aerating slope and then through small coke filters.

The effluent obtained by the system above described is much better than was got when the precipitation process was in operation; single contact is not found to be sufficient to deal with the strong sewage of the district, but this may in part be due to the small size of the septic tank.

The cost of the works was about £16,000; the cost of maintenance last year was £27, and that of labour, which is necessary owing to the need of pumping, was £383.

Halstead. In this district the sewage is treated by irrigation upon an area, 16 acres in extent, situated about $1\frac{1}{2}$ miles from the town in the parish of Colne Engaine, on the banks of the River Colne. The land, which has been in use for this purpose for the last 24 years, has a subsoil partly of loam and partly of gravel.

The population connected with the sewer is about 6,000, and there are also two breweries, a tannery, etc. The estimated dry weather flow is 40,000 gallons, but in wet weather this may be increased to 50,000 gallons, a part only of the surface water being excluded from the sewers.

Part of the sewage flows by gravitation on to the land, but a portion requires to be pumped, a windmill being used to furnish power for this purpose. The sewage undergoes no preliminary treatment, and is distributed over the land by drains and earthen channels. The land is under drained and the effluent discharges into the River Colne. One half of the land is laid out as an osier bed, while the remainder is arable land, various green crops being grown. There is no special provision for dealing with storm waters. The arrangements, which are said to have worked fairly satisfactorily, cost last year £125.

Borough of Harwich. The sewage from Harwich and Dovercourt, with a population of 9,000, is discharged into the sea by one outfall, which is about 100 feet beyond the sea end of the stone breakwater; at low water the depth at which the pipe is laid is 22 feet, while the mean rise and fall of tide is $11\frac{1}{2}$ feet.

The whole of the sewage is collected in a storage sewer or reservoir, 894 feet long, $6\frac{1}{2}$ feet wide, 3 feet deep, until one hour after high water, when a penstock is opened and the whole, without undergoing any treatment, is discharged through

18in. cast iron pipes in the sea; after the emptying of the reservoir, which usually takes 1—1½ hours, the penstock is shut down. The tide always runs strongly out to sea for the first three or four hours of the ebb. Before deciding on the position of the outfall many experiments were tried at all times of the tide in order to determine the drift or set of the outgoing tides, floats made of small pieces of wood, turnip, cork, etc., being put in the water and followed out to sea. It was conclusively proved that for the first four hours of the ebb everything went strongly in a southerly direction towards the Bell Buoy and thence in an easterly direction towards the Cork lightship; during the fifth hour the course was not so satisfactory, owing to the currents becoming slower, and during the last hour the floats were almost stationary, some having a tendency to drift into the bay to the south of the breakwater.

The Surveyor states that he has frequently been down to the outfall when the penstock was opened, and that it is very seldom that any trace of sewage or even discoloration of the sea water can be seen, and that beyond the presence of a few seagulls no indication of a sewage outfall can be detected.

The only oyster beds in the district are in the River Orwell, several miles distant, and as the penstock of the storage reservoir is closed at least one hour before low tide, no possible contamination can be caused by the sewage of Harwich or Dovercourt. Whelks are caught for bait on the sand in Dovercourt Bay, but the sewage does not go near this spot.

There is a separate system of sewers in the old part of Harwich whereby the storm water is taken and discharged into the harbour.

Ilford. At Ilford new works are in progress, which will do away with the present system of treatment by chemical precipitation.

At present the sewage from a population of about 50,000 is dealt with by treatment with lime and green copperas; that from Seven Kings, Goodmayes and Chadwell Heath has to be

lifted 10 feet by two centrifugal pumps, but the remainder of the sewage reaches the works by gravitation. The first treatment received is the addition of lime and sulphate of iron to the crude sewage, 27 bushels of the former and 4 shovelfuls of the latter being added every twelve hours; immediately after receiving the chemicals the sewage passes through three gratings, the intervals between the bars of which are 1, $\frac{3}{4}$ and $\frac{1}{2}$ inch respectively. Thence it passes to the settling tanks, three in number, each 60ft. by 100ft. in area, with a depth varying from 5 to $8\frac{1}{2}$ feet; one hour's dry weather flow fills one of these tanks.

At the time of my visit all the tanks were full, the sewage entering and flowing away from each continuously. About two-thirds of the effluent receives no further treatment and was discharged into a conduit leading direct to the Thames. The remaining third was being passed through filter beds, not with a view to purification but on account of the inadequacy of the other channel to take the whole flow. These beds are three in number, about 114ft. by 138ft. in area and 3 feet in depth, and are filled with coke breeze. The effluent is distributed on them by means of carriers, the levels of which have become irregular. The beds were overfull and waterlogged in many places.

In addition there is a small low-level bed intended for the treatment of the effluent when being drawn off from the settling tanks at too low a level to permit of gravitation to the other beds.

The new works. The contract for the portion which is in process of being constructed is for £15,000. Work was started in November, 1903, and the contract is to be completed within nine months from the commencement of the work. The works in progress include grit chambers (almost completed at the time of a recent visit), two large tanks for use as open septic tanks, and three storm water filter beds. The two tanks each measure about 141ft. by 195ft. in area, with a depth of about 8 feet. Their construction is well advanced, the concrete bottom being laid down. The three storm water filters, each measuring

150ft. by 150ft. by 3ft. in size, are of rough clinker resting on a clay bottom with numerous open drains. In addition to the above works, an extensive series of coke filters, 10 in number, is to be constructed later, under another contract, for treatment of the effluent from the septic tanks, which will include in addition to the two large new tanks, the three old settling tanks, which will in future be used as septic tanks.

Leigh-on-Sea. This urban district has a population of 4,000, and uses on an average 80,000 gallons of water per day. The water from the new streets does not enter the sewers, but the rain falling on the old roads, roofs and yards, passes into the sewers. The average flow of sewage is thought to be 100,000 gallons per day, nearly the whole of which reaches the works during the day.

The sewage works, which are of recent construction, are on an island separated from the town by a tidal creek. The island has an area of 9.1 acres. The works consist of four flint beds, each 27ft. by 9ft., containing $2\frac{1}{2}$ feet of flints, supported on an iron grating, and four bacteria beds of burnt ballast, each 150ft. by 60ft., and containing 3 feet of ballast. The sewage, which reaches the works by gravitation, first filters upwards through the flint beds, and is then distributed over the bacteria beds. When one bed is full the sewage therein is retained from $3\frac{1}{2}$ to 9 hours, according to the state of the tide, and is then discharged into the Thames, the discharge commencing 2 hours after the spring tides and $1\frac{1}{2}$ hours after neap tides being completed some time before low water. The beds are filled in succession.

A deep trench has been cut round three sides of the works, into which storm water flows. This water cannot get into the river save by passing through the filter beds, and it is simply stored here until it can be sent through the filters.

The sludge deposited under the flint filters is pumped by means of a hot air engine on to the land around.

At my last visit the works were in very good order and producing an effluent which did not tend to putrify, and which was of a fair degree of chemical purity.

Leyton. The method of sewage disposal in use in this district is that of precipitation. The works, which are situated close to the G.E.R. and about $\frac{1}{4}$ mile west of the main road and Town Hall, cover an area of about 11 acres; the population connected with the sewers is about 115,000 and the average daily flow is about three million gallons; there are no manufactories or breweries connected with the sewers, but there is a large number of steam and other laundries; the surface water drains only take the water from the front roofs and road gullies, all that from the back roofs and yards of the houses flowing into the ordinary sewers.

On entering the works the sewage, only a small proportion of which has to be pumped, is screened and then receives its proportion of lime, 10—12 grains being used per gallon; the lime having been well mixed in a vat containing about 800 gallons of water is discharged on to the sewage and thence into an underground chamber, where the sewage and milk of lime are well mixed by a pair of agitators; meanwhile more milk of lime is being prepared in another similar vat. After leaving the underground mixing chamber the sewage flows on, receiving in its course Hanson's sulphurous powder, 4 to 6 grains of which are added per gallon; the sulphurous powder has previously been mixed with water in one of two vats, each of which holds 1,000 gallons. After receiving the powder the sewage passes on into a second mixing chamber, whence after agitation it flows into tanks where it is allowed to remain till precipitation takes place. There are seven tanks, 150ft. by 60ft. in superficial area, each holding 275,000 gallons, so that the total tank capacity is no less than 2,000,000 gallons. Opposite each tank is a penstock connected with the treated sewage channel, so that the tanks can work independently or together, according to what is desired. The tanks are emptied

by means of a floating arm, which reduces the water to within a few inches of the sludge; the effluent, after flowing into a small stream, reaches the Lea at a point about 500 yards distant from the works. After the supernatant liquid has been drawn off, the sludge at the bottom of the tanks is moved by men with squee-gees and flows by gravitation into a sump 20 feet deep, whence it is pumped into the sludge tank. After the addition of lime the sludge is pressed, and subsequently burnt in the destructor, a serviceable clinker being the result: during the year ending 31st March about 12,000 tons of compressed sludge, containing about 50—60 per cent. of moisture, was thus disposed of.

The cost of treatment of the sewage, including the pressing, for the year ending March, 1903, was £6,005 4s. 6d.; this does not include the expense of burning the sludge in the destructor.

Loughton. The system adopted is that of the International Purification Company and the filters are of polarite. The population connected with the sewers is about 4,700, and there are no manufactories or breweries. The dry weather flow is estimated at 122,200 gallons per diem.

The sewage, all of which flows to the works by gravitation, passes through a screen which retains all the large solid particles such as paper, etc.; passing along to the tanks, it flows over lumps of precipitant placed in the various channels; sulphate of alumina was formerly used, but latterly aluminoferric is being tried and, though more costly, has been found to cause more complete precipitation. After the sewage has been allowed to settle in the tanks for 12 hours, the supernatant liquid is drawn off, by means of floating arms, on to one of the filters, the effluent from which runs along a channel and is discharged into the river without undergoing any land treatment. The sludge is swept out along channels into shallow pits; it is there mixed with ashes and when fairly dry is stacked into heaps and sold to neighbouring farmers at 3d. per yard.

All the house refuse of the district is taken to the sewage works and the men fill in their time sifting it for mixing with the sludge, at the same time burning the paper, rags, etc.

The tanks, which are four in number, have a capacity of 184,095 gallons. The filters are also four in number and have a total area of 2,780 sq. feet; they are separated from each other by a brick wall, the sewage being distributed over each by four circular stationary arms. They are 3 feet deep, there being 1 foot of sand placed on 6 inches of polarite, which itself lies on 1 foot 6 inches of gravel of various sizes; the filters are ventilated by means of land drain pipes placed along the bottom of the beds and are drained by 3-inch pipes placed 1 foot apart.

Owing to the heavy gradient of the sewers and to the fact that in many parts of the district the sewers are on the combined system, it is found that during storms there is a very sudden and great increase in the quantity of sewage to be treated. When such occurs the sewage flows over a tumbling bay into a special storm water tank of 32,319 gallons capacity, and when all the tanks have filled it passes direct on to the land, of which there is about $4\frac{1}{2}$ acres; this is drained and is now sown with tares. Various crops have been tried at different times, such as rye grass, mangels, etc.

The filters which have been in use since 1889 were re-laid two years ago. The working appears to be fairly satisfactory, the effluent being usually clear and bright and not causing obvious fouling of the river.

Borough of Maldon. The population connected with the sewers is about 4,500, and in addition there is one brewery and one mineral water manufactory.

The sewage, after being screened, is discharged at ebb tide by one cast iron outfall into a creek which empties into the tidal portion of the River Blackwater at a point $1\frac{1}{2}$ miles below Fullbridge; during tide lock the sewage is stored in tanks of a total capacity of 75,000 gallons. No complaints

have arisen of nuisance caused by this method of sewage disposal.

Romford. The sewage from a population of about 13,000 in this district is disposed of on a sewage farm situate in the parish of Hornechurch; in addition to ordinary sewage matter, the sewers receive waste matters from the large brewery of Messrs. Ind, Coope & Co. The dry weather flow is estimated to be 600,000 gallons, while the average daily flow is thought to be about 1,000,000 gallons; in some parts of the district there is a separate system of drains for conveying rain and surface water.

The sewage flows to the farm by gravitation, and is then pumped by means of centrifugal pumps into carriers, which allow of its distribution over the land; the total area of the farm is about 180 acres, 120 of which have been in use for upwards of 30 years, the remainder being added about seven years ago. The land, which has a subsoil of gravel and sand, is underdrained, at depths varying from 3 feet to 16 feet, on the herring bone principle; on the new portion of the farm the principal drains pass through manholes or inspection chambers before they discharge into the river.

The farm, of which 130 acres are arable, is laid out as an ordinary market garden, the crops being almost as diverse: celery is, however, the principal crop.

The effluent is discharged into the River Rom and is always of excellent quality. In times of heavy rain some of the sewage is turned into coke filter beds of about 29,000 feet capacity, and thence into the river.

The average cost of the farm per annum has been for the last two years about £766.

Saffron Walden. The method of sewage disposal adopted in this district is that of chemical treatment.

The sewage is received into tanks, and treated with alumino-ferric; after sedimentation has been allowed to take

place, the clear liquid is drawn off and discharged into a small brook, ultimately finding its way into the River Cam. The sludge is pressed and the nuisance formerly arising from its accumulation no longer occurs.

The arrangements are hardly satisfactory and the Local Government Board have upon several occasions requested the Council to improve upon the system by submitting the effluent to land treatment. The Council, on the other hand, are desirous of adopting the bacterial method of treatment, and in 1902 a scheme, based on a population of 6,000 increasing to 7,000, was drawn up; the scheme also comprised the provision of six miles of new sewers, which with manholes were to cost £7,058. The outfall works on the site of the existing outfall, with the addition of a piece of adjoining land, were estimated to cost £7,709; the effluent outlet pipes to the river were to cost £1,570, while the other expenses were estimated at £2,262. The existing tanks were to be utilized as detritus or grit tanks, from which the sewage was to flow to an anaerobic tank having a capacity equal to 30 hours flow, and thence to a series of double contact beds having a capacity of twice the daily dry weather flow. In addition storm water beds were to be provided to treat storm water equal to five times the dry weather flow. The total cost was estimated at £18,600, and after enquiry the Local Government Board stated that they were prepared to sanction the necessary loan on hearing that definite arrangements had been entered into for the acquisition of the land; they, however, were of opinion that the process of sewage treatment proposed by the Council was to be regarded somewhat as an experiment, especially as the contact beds were so shallow. The owner of the land, acting on the advice of a well-known firm of engineers, refused to give any facilities for carrying out the scheme proposed by the Council; the latter thereupon resolved to make application for a Provisional Order for the compulsory purchase of the necessary land, but this was not proceeded with as on 24th November last their Engineer reported the discovery of a discrepancy in the levels at the outfall works.

Shoeburyness. The district is drained into three main sewers, and the sewage, without any preliminary treatments is discharged into the sea at half ebb tide. Nearly all the w.c.'s are connected with the sewers, and there is a good supply of water for flushing purposes. Part of the system is provided with automatic flushing tanks. The outfall for the eastern portion of the district has a receiving tank, the measurements of which are 26ft. by 7ft. by 10ft., the outfall being about 1,130 feet from the shore. The second outfall is at a distance of 700 feet from the shore, and deals with the sewage from the western portion of the district; it has a brick barrel sewer 100 feet long and 4 feet in diameter for storage purposes. The third outfall deals with sewage from the property of the War Department, and is similar to that first mentioned. The population connected with the sewers is about 4,500, and the arrangements are said to work satisfactorily.

Borough of Southend-on-Sea. With the exception of a few houses which are below + 14ft. O.D., all the drains discharge into sewers connected with a single outfall which terminates beyond low water mark in the Thames at a point 600 yards east of the pier. The end of the outfall is about $1\frac{1}{3}$ miles from the shore.

There are two storm overflows, one into the Old Swatch and the other into the river near the Gasworks. These rarely overflow.

There are two pumping stations, one at the west end and the other at the east end of the town, for raising the sewage to the required level.

The whole of the sewage is discharged in its crude state during the first $4\frac{1}{4}$ hours of the ebb tide.

The sewerage of Prittlewell is not yet complete, but arrangements are now being made to pump the sewage into the high level sewers.

Waltham Holy Cross. The sewage works in this district are situated at Waltham Abbey, a quarter of a mile to the south-west of the town, and have been in use for the last 10 months; they comprise a pumping station, septic tanks with a capacity of half the dry weather flow, 2 circular continuous trickling bacteria beds, 6 feet deep, and 14 acres of land.

The population connected with the sewers is about 6,000 and the dry weather flow of sewage is estimated to be 150,000 gallons daily; there are no large manufactories or breweries, the sewage being solely derived from ordinary dwelling houses; all the roads are provided with storm water sewers and the street gullies are connected with them; the water from the front roofs of the houses also passes into the storm water sewers, but that from the back roofs and from yards is discharged into the ordinary sewers.

An 18-inch outfall pipe delivers the sewage into a screening chamber, $16\frac{1}{2}$ by 10 by 4 ft. in capacity, containing a large screen of $\frac{1}{2}$ -inch mesh, set at an angle of 45 degrees to the horizontal; this removes all the larger particles of solid matter which are raked off seven or eight times a day. The sewage then flows into one of the two detritus tanks, each $34\frac{1}{2}$ ft. by $16\frac{1}{2}$ ft. by $8\frac{1}{2}$ ft. in dimensions and of 30,000 gallons capacity; these tanks are worked by valves so that they can be used alternately; a scum board intercepts floating matters which have passed through the screen, while the deposited solid matters are removed periodically by a chain pump and conveyed to a "lagoon" on the land close by.

From the detritus tanks the supernatant liquid passes into a small pump-sump, 3 ft. square and $8\frac{1}{2}$ ft. deep; this is also regulated by valves from either detritus tank. From this sump the sewage is lifted by means of a three-throw plunger-and-lift pump and a 4-inch centrifugal pump into the rising main, and so to the open septic tanks, the capacity of which is half-a-day's normal flow, viz., 75,000 gallons; only one of the three tanks had, at the time of my visit, any scum formation on the surface. From the tanks the sewage passes directly to the bacteria beds,

two in number, one being 65 feet the other 60 feet in diameter, being discharged on the surface by an Adams' Patent Revolving Sprinkler, which is set in motion by the normal hydraulic pressure of the head of sewage, one revolution per minute being the maximum permissible discharge; means are provided for regulating the "head" of pressure. The beds (either of which is sufficient to treat the dry weather flow when the sprinkler is making one revolution per minute) are 6 feet deep, being filled with large pieces of hard vitrified clinker, ranging in size from 3 inch upwards, resting on a concrete floor which slopes towards an outer effluent-collecting channel surrounding each bacteria bed; from this the effluent passes into an open "rippling channel," 500ft. long and 2ft. broad, the floor of which is lined with broken pottery with sharp edges to agitate the liquid as much as possible; the effluent finally is discharged without land treatment into Cobbins Brook and thence into the River Lea.

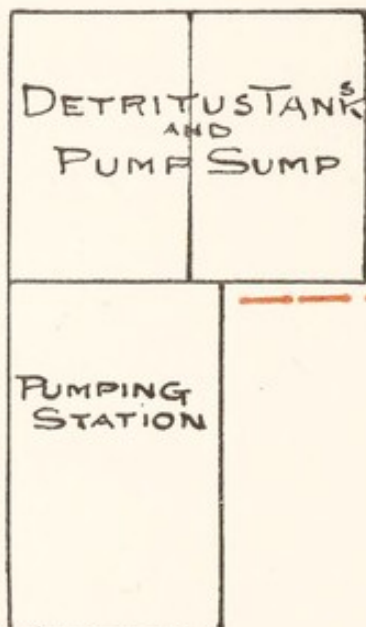
The working cycle is completed in 20 hours 15 minutes, 8 hours being occupied in the detritus tanks, 12 hours in the septic tanks, and 15 minutes in passing through the filter beds.

The greater portion of the 14 acres of land is at present unused; it is intended to utilize it for the construction of lagoons, and of osier and willow beds for the treatment of storm waters.

The cost of construction of the new works was under £1,100, and is much less than it would have been if the Local Government Board requirements had had to be met.

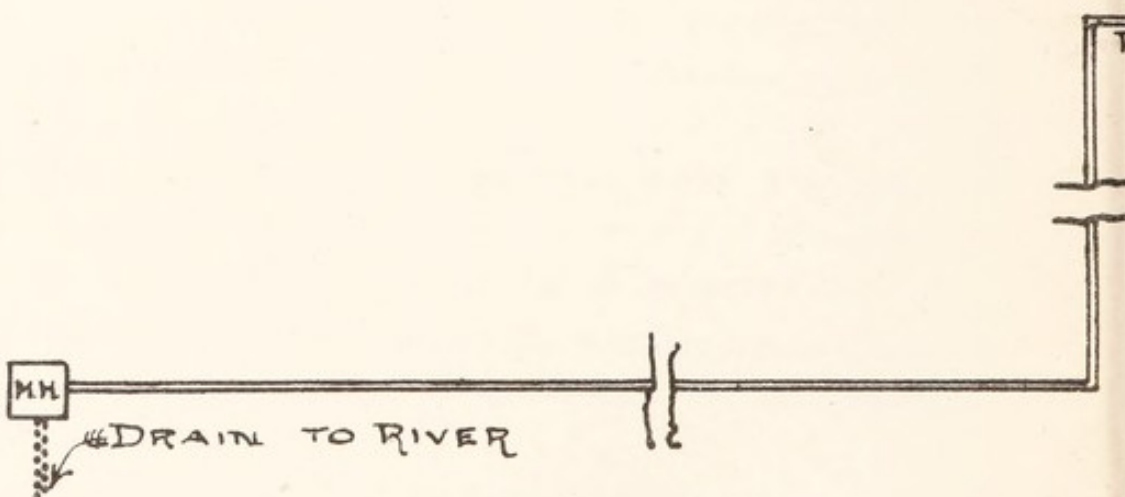
Dr. Daimer Priest, the Medical Officer of Health, to whose annual report I am indebted in great part for the above description, remarks:—

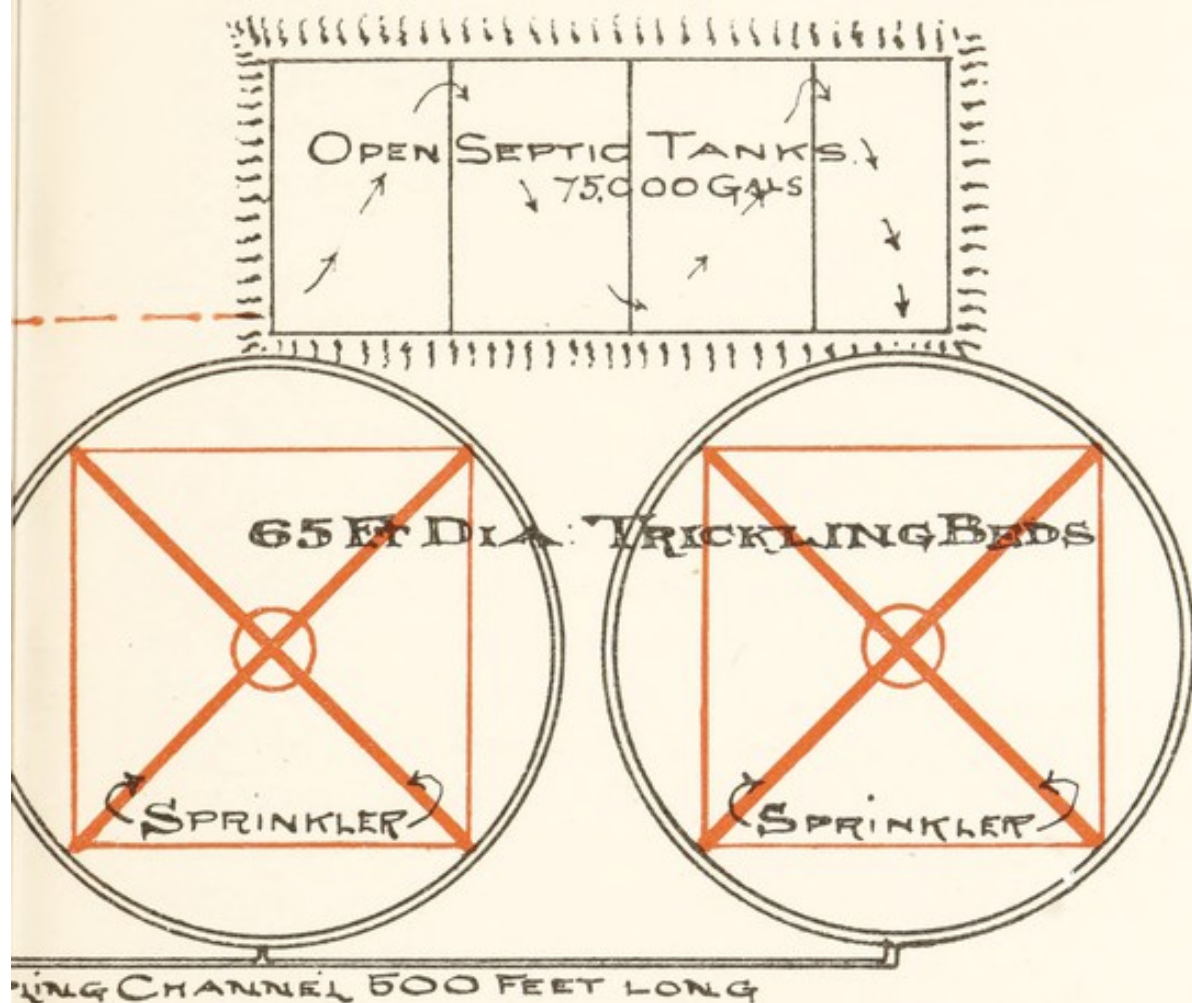
"No originality is claimed for the general principles of this
 "installation, but considerable ingenuity has been shewn in
 "adapting the pre-existing plant and tanks. An innovation of
 "considerable importance is found in the rippling channel; by
 "its means gases are dispersed, particles of carbon from the
 "beds are arrested, and the fluid is thoroughly oxygenated and



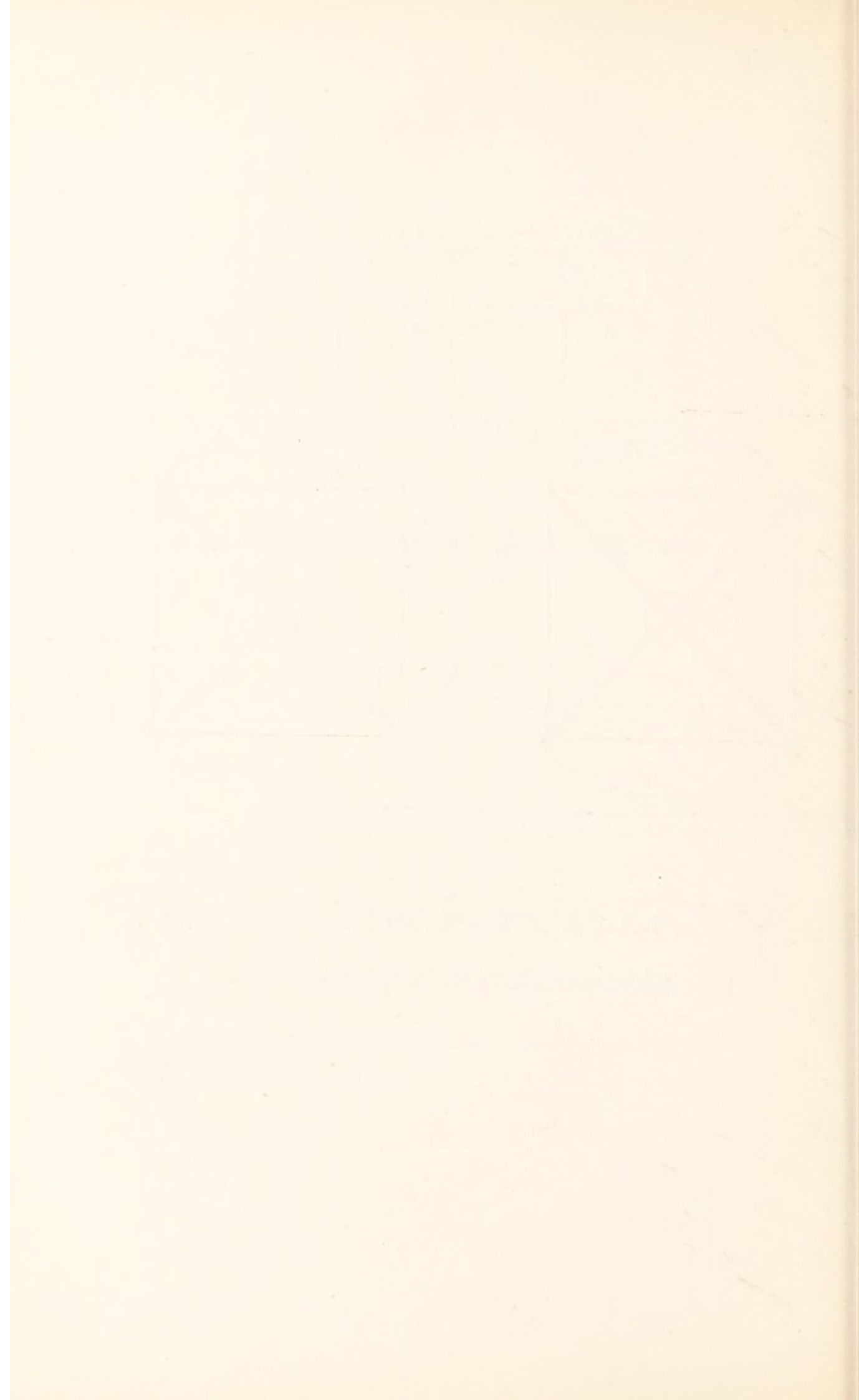
6" C.I. RISING MAIN

SCALE $\frac{1}{32}$ "





WALTHAM ABBEY SEWAGE WORKS



“aerated, producing a clear, bright and sparkling effluent, “odourless, nonputrescent, and capable of supporting the “respiration of coarse fish. The average percentage purification of the crude sewage, as measured by the relative quantity “of oxygen absorbed by the crude sewage and by the final “bacteria-bed effluent, is 83·7.”

A scale plan of the system is appended, by permission of the “Waltham Abbey Weekly Telegraph.” The works were designed by and carried out under the supervision of the Council’s Surveyor, Mr. W. Turner Streather, C.E., C.S.I.

Walthamstow. The sewage from this district, with a population of nearly 110,000, is treated upon an irrigation area situated at Low Hall Farm, in the western end of the district. The area, which has been in use over 20 years, is nearly 200 acres in extent and consists of gravel covered with 1 to 2 feet clay, which is itself covered by 1 to 1½ feet of top soil. The estimated dry weather flow is 1,185,000 gallons per diem, while the average daily flow is 2,700,000 gallons: a separate system of sewers is provided to take water from road surfaces and fronts of houses; in addition to smaller manufactories in the district, there is a large brewery.

The sewage is conveyed to the works chiefly by gravitation, but a smaller portion has to be pumped. After undergoing chemical precipitation in tanks, the sewage is distributed over the land by concrete and brick main carriers, by wooden portable troughs, and by trenches. The land is under drained at an average depth of about 3 feet, and the effluent flows into the Dagenham Brook. About one-half of the total area of the land is cultivated each year, the other half being used for the purification of the sewage; the crops grown are chiefly rye grass and mangolds; when the former is being grown the land continues to be irrigated with sewage. Storm waters are run on to special areas, which are planted with osiers.

The annual expense to the district of treating the sewage is no less than £6,000.

Walton-on-the-Naze. The sewage from this district, with a population of 1900, after passing through a septic tank is discharged into the sea by one outfall. There are no oyster or shellfish layings in the neighbourhood, and there are no complaints of the shore in proximity to the town being polluted. Originally the inflammable gas formed in the septic tank was burnt off, but unfortunately an explosion took place, after which the roof was re-constructed and a new ventilating arrangement put in. This, after being improved upon in several respects, now apparently gives satisfaction and no complaints arise as to offensive odours.

Wanstead. The system of disposal of sewage in use during the past two years in this district is that by bacterial treatment. The population connected with the sewers is about 11,000, but there are no manufactories or breweries. The dry weather flow is estimated to be 300,000 gallons but there are no gaugings showing the daily average; a very large proportion of the surface water from roads is carried off by separate surface water drains, but the water from yards passes into the ordinary sewers.

The total area of the works, which are situated between Wanstead Park and the City of London Cemetery, is about 33 acres, of which about 13 are used for purposes of irrigation; the sewage flows to the works by gravitation, passing into the detritus chamber, which is divided into two compartments, each having an area of 38ft. by 12ft.; these are cleaned out every six weeks, the contents being used for raising the level of the land; in addition to the detritus chamber, there is also a small catchpit at the entrance to the septic tank.

The septic tank is covered and consists of two compartments, each having an area of 100ft. by 58ft. and a depth of 9 feet. After leaving the septic tanks the sewage flows over bacteria beds, of which there are six, each 60ft. by 45ft. in dimensions and filled to a depth of 3ft. 9in. with gasworks clinker; stoneware channels were laid experimentally on the

surface of one of the beds to assist the regular distribution of the sewage, but no special advantage appeared to be gained by this. The beds are kept active by the ordinary process of working, and so far none of the filtering material has had to be re-placed.

From the bacteria beds the effluent is led either on to underdrained irrigation beds or on to a secondary coke filter, which is also used as a storm streaming filter; the effluent ultimately finds its way into the River Roding. Storm water, having passed through a detritus chamber, is discharged over a streaming filter, 400ft. long, 20ft. wide, and filled to a depth of 3ft. 9in. with gasworks clinkers.

The total cost of construction of the new works was about £4,500, but use was made of three old subsidence tanks, which were adapted for use as bacteria beds; some smaller tanks were also converted into a detritus chamber. The septic tanks and bacteria beds have up to the present cost nothing for maintenance; the irrigation beds and farm generally costs about £100 per annum for maintenance, while £130 is spent on labour.

The effluent entering the Roding upon analysis usually gives good results, often being the best entering that river.

Witham. The sewage from this district, with a population of about 3,000, is treated on a sewage farm situate about half-a-mile S.E. from the town. The area, which has been in use since 1869, is 43 acres in extent, and was underdrained in 1887 at a depth of about 4 feet; the subsoil is gravel and sand. The estimated dry weather flow is about 70,000 gallons, while the average daily flow is about 75,000 gallons. Surface water from roads is excluded from sewers, as also, of late years, that from roofs and yards, though where the old system remains much of the latter still finds its way into the sewers. In addition to sewage from houses, that from one brewery and from one malthouse has to be treated. The sewage is conveyed by gravitation into settling tanks, whence after subsidence has taken place it is conveyed by pipe carriers to numerous smaller

tanks distributed over the field ; by putting in sluices it is here brought to the surface and distributed over the field by broad irrigation through glazed pipe carriers. There are no special arrangements for treating storm waters. The effluent from the land passes direct into the River Blackwater. Thirty acres of the land are cultivated, the rest being meadow land. The principal crops are mangels, oats, and lucerne. The working of the system is found to be fairly satisfactory ; the actual expense last year was £512, which is about the average for previous years.

Wivenhoe. There is no proper system of sewerage in this district, nor is the sewage treated before being discharged by means of outfalls on to the mud of the River Colne.

Woodford. *Western Sewage Works.* The works are near the edge of Epping Forest, on the banks of the Ching Brook. They receive the sewage from about 132 houses in Woodford and 142 in Buckhurst Hill. They cover an area of about a quarter of an acre, and comprise a septic tank and filter beds.

The septic tank is divided into four by partitions, and has a total capacity of 160,000 gallons. The primary beds are of burnt clay and were constructed by dividing an old tank into three. The secondary beds are also of burnt clay, but of finer material.

The land is only used for the treatment of storm waters.

Eastern Sewage Works. These works are in course of construction, and provision is being made for a population of 21,000, though the population when the works are completed will be, it is thought, only 15,000. The dry weather flow is estimated to be about 20 gallons per head a day ; separate rain-water drains are provided in the case of all new houses, and as much surface water as possible is excluded from the sewers.

The sewage from the high level district will reach the works by gravitation, crossing the valley by means of a syphon ; that from the low level district will have to be pumped, being screened before entering the pump well. The open septic tank

has a capacity of 230,625 gallons. There will be 18 filter beds, each 6,400 square feet in area and $3\frac{1}{2}$ feet deep; 9 will be filled with coarse clinker and the remaining 9 with fine. The sewage will be distributed over the surface of the beds by means of fixed open channels radiating from the centre; Messrs. Mather and Platt's (Salford) apparatus has been adopted for filling and emptying the beds, which will be worked in 3 hour cycles, so that one pair of beds will always be resting.

After passing over the coarse beds and then over the fine beds, the effluent will be distributed over the land, finally passing into the River Roding.

When the sewage is diluted with storm water to such an extent that its volume exceeds six times the dry weather flow, the excess will pass over the storm overflow weirs untreated to the river; when the volume exceeds three times but does not exceed six times the dry weather flow the excess will be treated in a storm water filter at the rate of 500 gallons per square yard per diem; up to three times the dry weather flow the sewage will be fully treated in the bacteria beds.

The estimated cost of the works is £17,000.

Rural Districts.

Chelmsford Rural District. The sewage from three of the most populous parishes, viz., Springfield, Great Baddow and Widford, is treated with that of the Borough of Chelmsford upon the Brook End Sewage Farm in Springfield.

In addition, there are sewage works at Ingatestone and at Writtle.

At Ingatestone there is an irrigation area, situated in Stock Lane, which receives the sewage from the village of Ingatestone. The population connected with the sewers is about 800, and there are no manufactories, breweries, etc. The area of the field in common use is 9 acres 3 roods, but the Council have the privilege of using an additional 10 acres when the crops on the former are such as not to allow further sewage to be passed on to the land. The estimated dry weather flow

is about 40,000 gallons daily, surface water from roads, yards, etc., being only partly excluded from the sewers. The sewage flows on to the land by gravitation, and is received into two open subsidence tanks, each 8,500 cubic feet in capacity; from these it flows on to the land along stoneware pipe carriers and thence along ploughed furrows. There is no provision for the treatment of storm waters. The land is not underdrained and during dry weather there is apparently no effluent, but in rainy seasons the effluent passes into the River Wid. Various crops are grown upon the land, which is let to a farmer. The arrangement seems to answer well, there being no complaints.

At Writtle the works are of a somewhat temporary character, the village not yet being properly sewered. A new scheme for sewerage and sewage works has just been sanctioned by the Local Government Board, and will be commenced at once, the estimated cost being £6,430. The population connected with the sewers at present is approximately about (?) 1,000, and the average daily flow is from 25 to 30 thousand gallons. There is one large malthouse and no provision is made to exclude water from yards, roads, etc. The sewage flows by gravitation to the works in Lawford Lane, Writtle, and is received into two detritus chambers, each of 473 cubic feet capacity, and provided with galvanised iron covers; the sludge which is here deposited is pumped out by a chain pump, driven by an oil engine, and, after being dried by laying on land, is given to a farmer who carts it away about once in three months. After going through the detritus chamber the sewage passes, by means of half-pipe channels, on to a filter bed, filled with coke breeze to a depth of 2ft. 6in., and of an area of 152ft. by 28ft. The effluent from the coke bed is pumped out each day by means of a centrifugal pump worked by an oil engine, and is further treated by being passed over 6 acres of land. There is no effluent from the land except in very wet weather when it discharges into the River Wid. Storm waters are treated by passage over a second filter bed of

same size as that above-mentioned, the effluent passing direct into the river. Since the provision of the oil engine for pumping the effluent from the filter bed on to the land, no complaints have been received, and the arrangement seems to act satisfactorily.

Epping. At Harlow there is a small works dealing with the sewage from a population of about 1,500, with an estimated average daily flow of 30,000 gallons. The sewers are in part on the separate system, though some surface water finds its way into the ordinary sewers. The land is six acres in extent and has a subsoil varying in different parts from clay and sand to peat; it is not underdrained and for the last two years has not been cultivated. The sewage on arrival at the works passes through a small detritus chamber, and through one of two settling tanks, each of 8,900 gallons capacity; it is then distributed over the land by means of grips, so arranged that after passing over one portion it is collected and passed over a second portion, the effluent ultimately being discharged into the River Lea. Storm waters are treated by being passed over a portion of the land reserved for the purpose. I understand that improvements are about to be made upon the present method of sewage disposal.

Chigwell is at present drained to four separate outfalls, with treatment varying from cesspools with coke filters to septic tanks with double filtration at the Brook House Outfall and broad irrigation at Henwood side Outfall. The whole of the works are of a more or less temporary nature, the idea being to construct works eventually at the Henwood side Outfall, which will deal with the sewage of the whole district.

At Theydon Bois the sewage from a population of about 820, averaging about 24,600 gallons daily, receives treatment at the irrigation area, which has been in use for this purpose for the past four years. The sewage on arrival at the works is screened and then passed on to single contact beds, of which there are five, each of 9,760 gallons capacity; it then passes on

to the land, being distributed by means of grips, the effluent ultimately finding its way into a small brook. The land, which is $6\frac{3}{4}$ acres in extent and has a subsoil of clay, is laid out as permanent pasture. Storm waters are treated by passage over the land.

Maldon. In this rural district, three of the larger villages are sewered, the sewage being purified before discharge.

At Tollesbury there is a septic tank installation which has been in operation for the last two years. The works are situated at Woodrope Green, and cover an area of $1\frac{1}{2}$ acres; 270 houses, with a population of about 1350, and one brewery are connected with the sewers; the dry weather flow of sewage is estimated to be about 13,500 gallons, but as no precautions are taken to exclude surface water from roads, yards, etc., the quantity which has to be treated after heavy rains is generally much greater. The sewage flows to the works by gravitation and passes into a screening chamber, 4 feet long by 3 feet broad; this is cleaned out daily, the retained solid matter being removed on to the land, and when to some extent dried carted away to neighbouring farms. After being screened, the sewage flows into a covered septic tank, the superficial area of which is 25 by $8\frac{3}{4}$ square feet; the effluent from the tank is distributed by means of wooden troughs laid on the filtering material over the surface of one of two bacteria beds, each 30 feet long by 22 feet broad, filled to an average depth of 3 feet with coke breeze. The beds are used alternately, each being in action for 24 hours, but they have latterly become choked, this necessitating the replacement of the coke breeze.

The effluent from the bacteria beds is discharged into the tidal portion of the River Blackwater without further land treatment.

The works cost £200 in construction, and about £7 10s. per annum is paid for maintenance and labour.

At Tolleshunt D'Arcy the works deal with the sewage from a population of about 500, and cover an area of about $\frac{3}{4}$ acre.

The land has a subsoil of gravel, and has been in use for the last eight years; it is under-drained at a depth of $3\frac{1}{2}$ feet. The sewage flows to the works by gravitation, and is distributed over the field by open carriers and by trenches cut in the ground; the effluent having been collected into a concreted chamber, discharges by one outfall into a roadside ditch about 200 yards distant. At one time serious complaints arose owing to inefficient purification and to the fouling of an adjoining ditch, but latterly with more careful supervision the arrangement has worked admirably.

At Tillingham the works are of a similar character to that just described, the effluent ultimately finding its way into a ditch at a considerable distance from the village. The land used is 2 acres 35 poles in extent, and is under-drained at a depth of 2 feet 9 inches; it deals with the sewage from a population of 650. No complaints have arisen as to any nuisances caused by the works which seem to be a great success.

The cost of maintenance and of labour at the two irrigation works is practically negligible, only a small proportion of the scavengers' time being occupied in attending to the occasional changing of the direction of the flow of sewage.

Ongar. In this district there are two sewage works, one dealing with the sewage from the village of Ongar and the other with that from Abridge.

Ongar Works. The Ongar works, situated at Hallsford Bridge 1 mile S.E. of the town, have been in use for nearly two years, but all the houses have not as yet been connected with sewers, which at present receive sewage from a population of about 1,000 and also the waste material from one brewery; the dry weather flow is estimated to be 19,200 gallons per day; as much water from yards, rain troughing, etc., as possible is diverted from the sewer, being carried away by the old brick barrel drains. The sewage flows to the works by gravitation, and is received into one of two open septic tanks, from which it passes along open channels over the land.

The land covers $6\frac{1}{4}$ acres, and has a subsoil of gravelly loam; it is underdrained at a depth of 2ft. 6in., the effluent ultimately discharging by several outfall pipes into the River Roding. The area is laid out in level plots, all of which are laid down to grass except four which (1 acre in area) are used to their fullest extent; the sewage is only run over the grass plots at intervals, in order to give the other beds rest.

Storm water is provided for by an outlet in the sewer as it passes on to the works; by this means the sewage is distributed in times of heavy rain over the land without passing through the septic tanks.

Experiments are being made by the Surveyor to determine the rate of filtration which gives the best results; continuous filtration cannot always be depended on, so the sewage is now kept in contact with the land for varying periods, and the different effluents thus obtained are examined chemically. The observations have not yet been completed.

The annual expense of maintenance and labour is about £60.

Abridge Works. The works are situated half-a-mile west of the village, and have been in use about two years.

The sewage flows to the works by gravitation, passes into a closed septic tank from which it is pumped by means of two oil engines on to the land, over which it is distributed by earth channels. The land is four acres in extent, with a subsoil of clay, and is underdrained at a depth of 2ft. 6in; it is laid out as pasture land in three plots of equal size. The effluent, which discharges into the Roding, has varied considerably in quality from time to time and the Surveyor attributes this to too rapid filtration; he has endeavoured to obviate this by removing some of the collecting drain pipes and filling in the gaps so formed with gravel; the result has been a clearer effluent, but sufficient chemical analyses have not as yet been made to demonstrate the value of this means of improving the effluent.

The annual cost of treating the sewage at the works is £44, exclusive of charges for loans.

Romford Rural District. In this district are situated the sewage farm for the Urban District and five bacterial systems, three for the parish of Hornchurch, one for Great Warley, and one for Upminster.

The Upminster works are on the banks of the Ingrebourne, and comprise septic tank, primary and secondary coke breeze filters, and about $4\frac{3}{4}$ acres of land. The sewage first passes through two small detritus chambers, one of which is provided with a storm overflow, so that when an excessive amount of sewage is being discharged, the excess can go directly on to the land without passing through the septic tank or the bacteria beds. The sewage flowing through the detritus tank next passes into an open septic tank, 35 feet long, 19 feet wide, and 8 feet deep, from which it is discharged upon one or other of two primary beds, each having an area of 32 feet by 16 feet. From the primary beds the partially purified effluent can either be passed on to the land or on to a pair of secondary beds, the same size as the primary, the fall of the land permitting of this second treatment. From the secondary beds the effluent runs on to the low-lying land, which is underdrained and finally enters the river.

Complaints have arisen of smells arising from these works, but I have not observed any nuisance of this kind. Samples of the effluent entering the river from the land have always been satisfactory.

HORNCHURCH. This parish, on account of its size and the distribution of the population, drains to three separate works. One is on the bank of the Ingrebourne, opposite the Upminster works. The others are on a piece of land about 12 (?) acres in extent, on the bank of the Rom, one mile from Romford. The three are similar in character, save that the low level scheme necessitates pumping the sewage to get it on the higher portion of the land.

Each installation consists simply of a covered septic tank, with a series of bacteria beds, 3 to 5 in number; there are no secondary beds. After passing through the tank and bacteria beds, the effluent is allowed to flow on to the land, which is in part underdrained. Storm water can be passed directly upon the land.

The results obtained at these works have not always been as satisfactory as could be desired, but the installations are well worth visiting by authorities thinking of adopting the bacterial system.

The Great Warley works resemble those at Hornchurch.

Orsett Rural District. A very similar system to that just described is in use at Stanford-le-Hope in the Orsett Rural District. When recently visited a portion of the land seemed to be waterlogged.

Rochford. At Rochford the works are situated on the banks of the River Roach and comprise a detritus chamber, settling tanks, and filter beds. The sewage on arrival at the works first enters the detritus chamber, which is 6 feet long by 4 feet broad, and which, though $4\frac{1}{2}$ feet deep, has a working depth of 2 feet only, owing to the bottom being only that distance below the invert of the sewer. It then flows into settling tanks, of which there are two, each 30 feet long and $9\frac{3}{4}$ feet broad and 6 feet deep (working depth 2 feet only); in these tanks a certain proportion of the solid matters is deposited, being removed at intervals by a chain-pump, which pumps the sludge into troughs, which discharge into pits sunk in the earth.

The sludge having become sufficiently dry is shovelled out of the pits into heaps and sold to farmers, usually by auction, generally realizing about 1s. $2\frac{1}{2}$ d. per load.

The supernatant liquid in the settling tanks flows continuously on to a filter bed, 34 feet long by 11 feet broad, and filled to a depth of 2 feet 3 inches with large pieces of coke 2 or 3 inches in diameter; the tank containing the filtering material is emptied about every six weeks, the coke being thrown out, washed and having been allowed to dry is re-placed

when next the bed is being cleaned out; about one chaldron of fresh coke is required at each operation.

The effluent from the filter bed passes, by means of an outlet pipe from the bottom of the tank, into the River Roach, which is 40 feet distant.

Storm waters are similarly treated, but when the filtering tank becomes filled the overflow passes, by means of a special outfall pipe from the top of the tank, into the river at a point 77 feet distant.

The works are unsatisfactory.

Stansted. The sewage works of the district are of unusual interest, not on account of the method of sewage disposal, but because it is the first installation in England of the Liernur improved pneumatic system of sewage collection.

The village is a large one, having a population of about 2,000; the higher portion has for some considerable time possessed a system of sewerage by water carriage, but to similarly sewer the lower portion was found to be impossible, having regard to the large expenditure of water which would be found necessary for the copious flushing required owing to the peculiar basin-like formation of the district.

After considerable enquiry the Council decided to adopt the Liernur system, which may be described as a vacuum system of collection. As far as possible the sewage is conveyed to the works by gravitation, and a considerable portion of the liquid part of the sewage flows to the works by this means. For the carriage of the remaining portion including that from the lower part of the village, vacuum suction is employed. At Stansted from the central pumping station a tubular sewage network of 4-in. cast iron pipes leads to the streets. A vacuum is created in the cylinder at the station by means of a vacuum pump, and the whole bulk of the sewage is brought to the station without the addition of flushing water, so that the bulk of the sewage is not increased by extra water. By means of the suction a great velocity is attained in the

sewers, from 10 to 15 feet per second. This velocity, it is claimed, gives absolute security against stoppages, and in this way manholes, inspection chambers, and overflow arrangements are done away with, besides which there is economy in construction of the works. At Stansted the quantity of sewage dealt with is about 10,000 gallons per day, and the whole system of the conveyance of the sewage lasts only 10 minutes. There has to be no special provision for storm waters, as there is a separate system of drains for surface water. The syphon is moved periodically, so that there can be no stagnation in the sewer. It could be emptied 20 times a day, if required, as it is done automatically. The cost comes to under one shilling per head of the population per annum. By this vacuum suction system the whole of the sewers are also cleansed and filled with pure air every day, or as often as desirable, and from the starting of the gas engine the complete service of the system over the whole network of street sewers and house connections, in all about two miles, takes 15 minutes.

In the matter of house connections there is very little difference between those of the Liernur system and those of the water carriage and gravitation system. The Liernur house-fall or syphon-box is said to be a great improvement upon the existing models. It is at once a syphon, a seal, an intercepting and inspection chamber, and it also allows of the cutting-off of any house from the general system. This box, which is of cast iron, and hermetically sealed, is placed in the most suitable position to enable the sewage from various w.c.'s, sinks, etc., to be discharged into it, and also to secure for the house connections as much as possible the benefit of the air-flush which enters the air inlet immediately above the box. The contents of this syphon-box are being constantly displaced by pressure, which is facilitated by the partial vacuum at the station. It is claimed that no contamination of the air by sewer gases, etc., is possible, the whole network of sewers being airtight. Noxious gases are drawn to the pumping station, and from thence carried to the retorts of the gas works adjoining, and passed through the fires.

It is stated that a saving in construction is effected, compared with the ordinary sewerage systems, by the small amount of excavation required, the absence of flushing chambers, manholes, ventilating columns, etc., and the small diameter of the pipes laid down.

The economy in working expenses arises mainly from the fact that at the pumping station the quantity of sewage received is kept at the lowest possible limits for discharging into the high level gravitation sewer, and this is effected without prohibiting the use of water for flushing the closets, sinks, etc. Stoppages are said to be infrequent, and can soon be remedied and at little cost. No fall or incline of the ground is necessary for this system, but is used where available.

As to the cost of the installation at Stansted, the figures given by the Secretary of the English Syndicate show that the actual capital cost is below £2 per head for 1,000 people, that number being now actually connected to the system at Stansted. The present installation will serve three times the population, and the actual plant at the pumping station would serve probably six times. They are able to draw the whole of the sewer gases to the pumping station, and there burn them, and also by the same means ventilate and purify the sewage tank, which adjoins the pumping station.

As to the working expenses, the actual cost comes out between 10d. and 1s. per head per annum, including lifting the total sewage 35ft. to high-level sewer. The cost of one suction for cleaning the whole of the sewers and house connections, removing deposits, sewage, noxious gases, &c., in all works out at 10d., that is 10d. for cleaning out nearly two miles of sewer pipes. This figure of 10d. includes the cost of collecting the sewage and of its discharge on the irrigation fields.

The machinery is fairly simple, and consists of the following: A boiler plate vacuum reservoir (with a capacity of about 2,800 gallons), a gas engine, eight horse-power, a vacuum pump of three-quarters horse-power, and a lifting pump, for pumping the sewage to the high-level sewer. Adjoining the

pumping station is the storage tank, with a capacity of 30,000 gallons, which represents the quantity of sewage estimated to be delivered in three days.

The Liernur system of collection assists in the final disposal by delivering at the works a sewage which has been thoroughly broken up by the violence of its conveyance. It must be undoubtedly a great factor in the successful disposal of sewage, whatever method may be employed, bacterial, chemical, or treatment over land, if a Sanitary Committee and their Engineer can depend on the unvarying quantity and quality of the sewage delivered at the outfall, and these advantages seem to be secured by the Liernur Pneumatic Sewerage System.

The sewage having been pumped into the high level sewer is conveyed by gravitation to the sewage farm, one mile south-west of the village; the land covers an area of about three acres, and has a subsoil of light loam and gravel; mangels and osiers are grown, £50 per annum having been obtained in one year by the sale of the former. The effluent is conveyed on to a pasture about 5 feet above water-level, ultimately finding its way into the River Lea.

NOTES TO ASSIST IN THE INTERPRETATION OF RESULTS OF ANALYSES OF SEWAGE EFFLUENTS GIVEN UPON PAGE 122.

Colour.—A good effluent should have no appreciable colour when viewed in a column 3 ins. in depth.

Odour.—A good effluent should have no offensive odour even after being kept for several days in a warm place (98° F.)

Turbidity.—This is expressed in degrees varying from 0 to 100. 0 represents perfect freedom from suspended matter. A liquid with a turbidity of 100 contains so much suspended matter that a column $\frac{1}{2}$ an inch in thickness entirely obscures black lines on white paper. A satisfactory sewage effluent should not have a turbidity exceeding 10°.

Degree of Oxygenation.—Raw sewage contains no free

oxygen. An effluent fully saturated has a degree of oxygenation expressed by 10. The more nearly an effluent is saturated the better its quality.

Chlorine.—Usually the amount of chlorine present (in combination as sodium chloride) gives some indication of the strength of the sewage, but in districts where the chlorides in the public water supplies vary in quantity, or where chlorides are added to the sewage, the amount present has little significance.

Nitrogen as Nitrates and Nitrites.—Bacterial purification of sewage results in the formation of nitrites and nitrates. The more efficient the purification the greater the amount of these substances in the effluent.

Free and Albuminoid Ammonia.—The lower the figures for the ammonias, the better the effluent. A fairly good effluent should not yield more than .10 grain of albuminoid ammonia per gallon.

Oxygen Absorbed.—The smaller the amount of oxygen required to oxidize the organic and other matters the better the effluent. After keeping, the oxygen absorbed should not increase. After 3 hours the oxygen absorbed should not exceed 1.0 grain per gallon.

PREMISES OVER WHICH THE SANITARY AUTHORITIES EXERCISE SPECIAL SUPERVISION.

Factories and Workshops. Considerable attention appears to have been given in nearly every district to the inspection of factories, workshops and workplaces. In one or two districts only do the Medical Officers appear to be unacquainted with the duties which devolve upon them under the recent Act.

Slaughterhouses and Bakehouses. Improvements continue to be recorded. Underground bakehouses have all either been abandoned or altered to meet the requirements of the few authorities in whose districts they are found. Fortunately there were very few in Essex.

TABLE OF ANALYSES OF VARIOUS SEWAGE EFFLUENTS.

	Source.	Odour.	Turbidity	Degree of Oxygenation.	Chlorine.	Nitrogen in Nitrates and Nitrites.	Free Ammonia	Organic Ammonia	Oxygen absorbed in 3 hours.	Remarks.
1. Chemical Treatment— December 23rd, 1903	East Ham	Urinous	3	—	18.5	1.70	1.43	.14	.85	Above average quality
	Leyton...	"	3	—	7.7	—	1.21	.32	1.90	Average of several samples
	Loughton	"	4	8	7.2	—	2.0	.112	.49	Followed by filtration through polarite
2. Bacterial Treatment— May 8th, 1903 May 15th	Buckhurst Hill	"	5	8	7.7	—	1.8	.17	.69	Not so good as usual
	Burnham	Earthy	5	—	44.6	—	.55	.19	.99	Fair effluent
	Leigh	Faint	4	—	36.2	.90	1.40	.12	1.3	
	Waltham Cross	"	2	10	8.8	—	1.43	.21	1.36	Not very satisfactory
	Wanstead	Urinous	6	9	4.8	—	1.60	.15	.43	Fair effluent
	Hornchurch (S.)	Faint	5	2	7.4	—	.80	.15	.74	"
	" (N.)	"	2	8	12.5	—	1.25	.13	—	"
	" village...	"	2	8	15.0	—	1.20	.13	—	"
	Upminster	Faint	2	6	8.0	—	2.96	.19	.79	Not so good as usual
	Chelmsford	Earthy	20	4	7.9	.20	1.00	.29	2.51	Very unsatisfactory
	Epping (Pailfield)	"	4	10	5.4	—	.14	.07	.61	Good
	" (Cingfoil)	Urinous	8	2	4.4	—	1.00	.14	1.35	Not satisfactory
3. Land Treatment— August 22nd, 1903 July, 1904 May 2nd	Romford	Earthy	4	10	11.6	1.0	.32	.09	.58	Satisfactory
	Ongar	"	7	4	8.4	.36	1.28	.12	.81	Fair
	Abridge	Urinous	2	9	2.9	—	.13	.06	.55	Satisfactory

These figures refer to Grains per Gallon.

Cowsheds, Dairies and Milkshops. A few districts only appear not to have made bye-laws for regulating the conditions under which milk is produced and sold. The attention of Medical Officers of Health is directed to the following bye-law recently adopted by Southend:—

“Every retail purveyor of milk shall cause every vessel containing milk to be protected from dust, flies, and other sources of contamination by means of suitable covers.”

The Chelmsford Rural District Council are seeking further powers to (1) prevent milk being cooled in any place in which cows are kept or milked; (2) to enforce the washing of the udders and teats of the cows and the hands of the milkers, and (3) securing proper storage of milk by the retailer so as to prevent access of dust, flies, etc.

There is room for much improvement in the condition of cowsheds and dairies generally. Great improvements have been effected during the last few years, and doubtless a much higher standard will ultimately be reached.

The subject is of such importance that I intend making special reference to it in next year's report.

INSPECTOR'S REPORTS.

The special reports issued by Inspectors in the large districts are summarised with the Medical Officers' Reports. The general information is summarised in Tables No. XXVII. and XXVIII. It is to be regretted that in two or three districts no proper summary of the Inspectors' work is furnished.

CHIEF IMPROVEMENTS EFFECTED AND FURTHER IMPROVEMENTS REQUIRED.

As in the Reports for the last two or three years, the "Improvements Required," so far as ascertainable in each district, have been summarized. The remarks placed opposite to each indicate the steps taken during the year to effect improvements.

Urban District.	Improvements required.	Improvements chronicled in 1903 and Remarks.
BARKING ...	... Better system of sewage treatment. Improved ventilation of sewers and relaying of old sewers. Refuse Destructor. Sanitary tenements for labouring classes at low rental. Enlargement of Isolation Hospital. Water Supply for Creeks-mouth and elsewhere Public sanitary conveniences for both sexes. Pavement of many courts and back yards.	No alteration made. Much still to be done. Not provided. A number provided during the year. More required. Eight additional beds provided during the year. Not yet provided. Not provided. Effected in several instances
BRAINTREE ...	...	No mention of improvements in report.
BRENTWOOD ...	... Improved flushing and ventilation of sewers A public mortuary. An ambulance. Flushing apparatus required in many w.c.'s Improved scavenging arrangements. Increased housing accommodation for the working classes.	Still required. Still required. Still required. Still required. 29 cottages provided by the Council.
BRIGHTLINGSEA ...	... Provision for thoroughly flushing sewers. Improvement in the method of drain testing. Regulations for Dairies. Use of the powers given by the Food and Drugs Act.	Still required. Action not taken.
BUCKHURST HILL...		No mention of improvements in report.
BURNHAM ...	... Flushing apparatus to W.C.'s. Storage reservoir for water of 200,000 gallons capacity. Isolation Hospital.	247 out of 717 are now so fitted. Cottage only provided.

Urban District.	Improvements required.	Improvements chronicled in 1903 and Remarks.
CHELMSFORD	Isolation Hospital. Increased water supply. Veterinary Inspector to inspect cows in cow-sheds. Refuse Destructor. Draining and sewerage Bundicks Hill.	New Joint Hospital still under consideration. Bored well in progress. Not yet appointed.
CHINGFORD	... Additional bacteria bed at Sewage Works.	In course of construction.
CLACTON	... Abolition of ashpits. Refuse Destructor.	
COLCHESTER	... Extension of sewage works. Augmentation of water supply.	Completed during the year. In hand.
EAST HAM	... Improved sewage works. Cheaper cottages for workmen. New Scarlet Fever Hospital.	Over 100 completed by the Council. Plans and estimates passed for a 60-bed hospital.
EPPING...	... Flushing cisterns to w.c.'s. Fortnightly collection of house refuse. More water. Better houses for labourers Improved sewerage.	44 repaired or closed. Several new sewers provided.
FRINTON	... Improved drainage.	Being provided.
GRAYS ...	... Better flushing and ventilation of sewers. Improvements at sewage works. Steam Disinfector. Paving of back roads. Cheaper houses for labourers.	Provision of ventilating shafts completed. In progress.
HALSTEAD	... Improvements at Sewage Farm. Re-laying of High Street sewer. Better disposal of refuse.	Carried. out.
HARWICH	... Extension and improved ventilation of sewer in Upper Dovercourt.	
ILFORD	... Better system of disposal of house refuse. More adequate sewage works.	System improved. Additions in progress.
LEIGH...	.. Isolation Hospital. Constant water supply.	Not provided. Scheme under consideration
LEYTON	... Isolation Hospital. More public sanitary conveniences. Pavement and drainage of the roadway at the rear of shops.	Site selected. Many such nuisances abated.

Urban District.	Improvements required.	Improvements chronicled in 1903 and Remarks.
LOUGHTON	... Insanitary cottages at Pump Hill, &c. More efficient sewage purification. Flushing apparatus for w.c.'s in old cottages	Still standing. Still required.
MALDON	... Increased water supply. Sewer for Fullbridge and Causeway. Substitution of w.c.'s for dilapidated privies. Improved scavenging. Isolation Hospital. Prevention of foreshore pollution.	Still inadequate. Sewer behind Foundry Terrace. Still required. New Joint Hospital provided.
ROMFORD	... Making up new roads.	
SAFFRON WALDEN	Improved system of sewage disposal.	Still under consideration.
SHOEBURYNESSE	...	No sanitary improvements chronicled
SOUTHEND	... Drainage of Prittlewell and Westcliff Park Estate. Enlargement of Isolation Hospital. Provision of refuse destructor. Provision of Public Abattoir. Treatment of sewage before discharge into the sea.	Completed. { New block provided in 1902. Plans for enlarging administrative block prepared. Still under consideration. Still in abeyance. Considered, action deferred.
WALTHAM HOLY CROSS	Improved system of sewage treatment. Permanent Joint Isolation Hospital. Cleansing of Cobbin's Brook. Impervious paving round new houses.	New biological installation in operation. Plans prepared and sanctioned by L.G.B.
WALTHAMSTOW	... New sewage works. Refuse Destructor. Provision of sanitary ashbins. Further Isolation Hospital accommodation. Separate vans for the removal of infected and disinfected articles. More public conveniences.	Loan sanctioned by L.G.B., but no further progress made. Not yet provided. Bye-laws in operation and some improvement effected. Plans submitted to L.G.B.
WALTON-ON-NAZE...	Isolation Hospital accommodation. Carrying sewer outfall further out to sea.	Not yet provided.

		Improvements chronicled in 1903 and Remarks.
Urban District.		
WANSTEAD	... Improvements required. Ventilating shafts for sewers. Enlargement of Isolation Hospital.	Carried out.
WITHAM	... Isolation Hospital. New water supply.	Not yet commenced. In progress.
WIVENHOE	... Isolation Hospital. System of sewers.	Not yet provided. Scheme postponed.
WOODFORD	... Alteration and extension of Eastern sewage sys- tem. Filling up old ponds. Improvement of Eastern sewage works. Isolation Hospital.	In progress. Not yet done. In progress.
Rural District.		
BELCHAMP	... Isolation Hospital.	Not yet provided.
BILLERICAY	... Water supply. Sewering lower Billericay. Sewer and sewage works at Wickford. Sewer at Hutton. Sewer at Brook Street. Sewer at Priest's Lane. Lodge at Isolation Hospi- tal.	Well sunk 787 feet. Trial pumping to be made. Further progress made, but the scheme is incomplete. L.G.B. inquiry held, but decision not yet published Sewer completed. In hand. In hand. Built and occupied.
BRAINTREE	... Building bye-laws.	No reference in 1903 report. New sewers laid at Cogges- hall and Wethersfield. Various new or improved water supplies.
BUMPSTEAD	... Provision of a new sewer with proper outfall at Steeple Bumpstead.	Water supply at Ashen provided.
CHELMSFORD	... Sewerage and water supply for Writtle. Enlarged Isolation Hospi- tal.	In progress. Under consideration, but little progress made. New building bye-laws approved by L.G.B. Progress with water sup- plies at Baddow & Spring- field and at Ingatestone.
DUNMOW	... Isolation Hospital. Water supply for Felstead. Better sewage disposal at Dunmow.	Water supply obtained (deep well). Scheme adopted. Information collected.
EPPING	... Extension of sewers at Theydon Bois. New ambulance. Improved drainage of parts of North Weald,	Carried out in part. New pipe sewer at Harlow. Not yet provided.

Rural District.	Improvements required.	Improvements chronicled in 1903 and Remarks.
HALSTEAD I.	.. Sewerage for Earls Colne. More abundant water supply for Earls Colne.	No progress made. No progress made.
HALSTEAD II.	... Bye-laws for drainage and keeping of animals.	
LEXDEN AND WINSTREE	Improved sewage systems at Marks Tey, Rowhedge, Dedham and West Mersea. New water supply at Rowhedge.	New sewer and sewage works at Sible Hedingham. Not yet commenced.
LEXDEN AND WINSTREE	New water supply at Abberton.	Complete. Mains laid.
	There is no proper Isolation Hospital.	Little progress made.
	Pump at Fingringhoe spring.	New deep well at Stanway.
MALDON	... Water supply for Tolleshunt Knights. Deep well at Tollesbury. Isolation Hospital. Improved water supply, Goldhanger. Improved drainage, Bradwell. Improvements of Steeple wells. Improved water supplies for Creeksea and Heybridge. Improvements of Southminster sewage outfalls.	Building bye-laws in force. Loan sanctioned by L.G.B. Nothing done. Completed. Loan sanctioned and work in progress. Being dealt with.
ONGAR	... Sewerage of eastern part of High Ongar and of Fyfield. Isolation Hospital. Disinfector. Water supply for Bobbingworth.	One repaired and deepened. Negotiations proceeding with private well owners at Heybridge. One extended, but further measures needed. Scavenger appointed at Heybridge Basin.
ORSETT	... Sewerage of Little Thurrock. Water supply to Horndon-on-the-Hill. Drainage of West Thurrock and Aveley. Water supply to Orsett, Corringham & Fobbing.	Still under consideration. Loan sanctioned. Further extension.
ROCHFORD	... Better water supplies. Drainage, Rayleigh, Hadleigh, Benfleet, and St. John's Land, Wakering. Drainage, Rochford.	Completed. Mains laid to Orsett and Corringham. Agreement with Southend Water Co. to supply Fobbing. Western scheme in operation. Still under consideration.

Rural Districts.	Improvements required.	Improvements chronicled in 1903 and Remarks.
ROMFORD	... Sewerage of Dagenham.	Scheme still under consideration of L.G.B.
	Sewerage of Rainham.	Scheme awaits sanction of L.G.B.
SAFFRON WALDEN	Improved water supplies.	Deepening of wells at Ashdon and Clavering. Reconstruction of well at Wicken.
	Improvement at Newport of sewer outfalls into river.	
STANSTED	...	New well at Henham.
TENDRING	... Sewering of Manningtree and Mistley.	Not yet commenced.
	Improved sewers for Bardfield, Elmstead, Ramsey, Parkeston and Thorpe.	Recently executed works at Parkeston and Weeley require modification.
	Better water supplies at Beaumont, Weeley and Wix.	
	Sewer at Great Holland.	
	Water supply for St. Osyth.	Public well decided upon.
	Water supply for Little Clacton.	
	Water supply for Ardleigh.	Company's main extended to the village.
	System of scavenging at Manningtree, Lawford, and Mistley.	

SUMMARY OF WORK DONE IN THE COUNTY PUBLIC HEALTH LABORATORY, CHELMSFORD.

Bacteriological Department—

Diphtheria, Swabs examined	...	1,144
Enteric Fever, Blood examined	...	25
Tuberculosis, Ring-worm, etc.	...	66
Water	... ..	53
Total bacteriological examinations		1,288

Chemical Department—

Samples of drinking water	...	171
„ river water and sewage effluents	... ..	170
Milk	... ..	4
Total chemical examinations	...	345

JOHN C. THRESH.

TABLE XXVII.

URBAN DISTRICTS.

SUMMARY OF REPORTS BY SANITARY INSPECTORS.

	Barking.	Braintree.	Brentwood.	Brightlingsea.	Buckhurst Hill.	Burnham.	Clacton.	Chelmsford.	Chingford.	Colchester.	East Ham.	Epping.	Frinton.	Grays.	Halstead.	Harwich.	Ilford.	Leigh-on-Sea.	Leyton.	Loughborough.	Malden.	Romford.	Saffron Walden.	Shoburness.	Southeast on-Sea.	Waltham Holy Cross.	Walthamstow.	Walton-on-the-Naze.	Wanstead.	Witham.	Woodford.	Wivenhoe.
1. Complaints received	146																															
2. Nuisances detected	797																															
3. Nuisances abated	862																															
4. Notices served	137																															
5. Summonses taken out	1																															
6. Convictions	1																															
7. Premises inspected	2201																															
8. Lodging-houses inspected	4																															
9. Slaughter-houses inspected	4																															
10. Bake-houses inspected	16																															
11. Dairies and Milk Shops inspected	39																															
12. Cowsheds inspected	4																															
13. Workshops inspected	65																															
14. Filthy houses cleansed, sec. 46, Public Health Act, 1875	381																															
15. Houses disinfected	18																															
16. Overcrowding abated	3																															
17. Houses placed in habitable repair	3																															
18. Houses closed	...																															
19. Houses erected or rebuilt for which Water "Certificates" were applied for	...																															

*Number of inspections.

20. "Certificates" granted	...																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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TABLE XXVIII. RURAL DISTRICTS.

SUMMARY OF REPORTS BY SANITARY INSPECTORS.

	Belchamph.	Billericay.	Braintree.	Bumpstead.	Chelmsford.	Dunmow.	Epping.	Halstead No. 1.	Halstead No. 2.	Lexden and Winstree.	Maldon.	Ongar.	Orsett No. 1	Orsett No. 2.	Rochford.	Romford.	Saffron Walden.	Stansted.	Tendring.
1. Complaints received	10	50	27	..	29	18	61	..	23	23	26		60	60	31	10	3	4	28
2. Nuisances detected	62	208	20	34	275	103	167	76	48	173	153		227	227	79	257	55	239	528
3. Nuisances abated	54	333	47	34	292	91	150	60	65	166	133		287	287	110	403	58	200	472
4. Notices served	23	118	20	32	304	119	228	76	26	47	172		115	115	110	266	58	40	26
5. Summonses taken out	1	2	..	..	2	..	..	..	..	..	..		..	..	..	..	..	..	1
6. Convictions	1	2	..	..	2	..	..	..	..	..	..		..	..	..	..	..	..	1
7. Premises inspected	242	122	613	82	1950	289	203	229	44	976	1320		385	385	120	..	436	240	489
8. Lodging-houses inspected	..	..	..	..	..	1	..	..	..	..	..		..	..	5	1	..	..	..
9. Slaughter-houses inspected	..	..	..	..	..	12	5	5	7	15	16		12	12	4	12	12	16*	13
10. Bakehouses inspected	15	13	41	7	45	33	24	9	16	25	26		19	19	3	16	36	20*	13
11. Dairies and Milk Shops inspected	1	8	26	4	63	19	20	10	6	6	28		24	24	4	11	24	..	52
12. Cowsheds inspected	1	25	58	7	63	22	50	10	8	15	33		29	29	5	30	24	24	47
13. Workshops inspected	52	17	95	35	175	86	16	42	57	5	66		..	..	..	..	68	28	12
14. Filthy houses cleansed, sec. 46, Public Health Act, 1875	..	..	..	..	..	4	..	..	..	..	..		..	..	..	..	..	..	..
15. Houses disinfected	1	21	18	3	65	7	38	20	6	32	24		65	65	28	17	1	..	1
16. Overcrowding abated	1	2	..	..	6	5	5	..	1	5	14		3	3	3	170	21	29	53
17. Houses placed in habitable repair	..	4	2	..	7	11	15	7	..	15	8		..	..	..	7	4	2	2
18. Houses closed	..	1	..	..	2	1	4	..	..	..	1		..	..	..	3	1	16	14
	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	6	..

*Number of inspections.

[illegible]

APPENDIX.

SUMMARY OF REPORTS OF MEDICAL OFFICERS OF HEALTH.

I. PORT SANITARY DISTRICTS.

COLCHESTER.

Medical Officer of Health—C. A. S. LING, M.R.C.S.

During the year 441 vessels entering the Colne, 27 of them from foreign parts, were inspected, and all were found to be in a very satisfactory condition. No cases of infectious or other disease have occurred. The hospital is in good condition and ready for any emergency that may arise.

On August 8th, nine of the crew of the s.y. "Lorena" were drowned in the Colne, owing to the overloading of a row boat.

HARWICH.

Medical Officer of Health—H. GURNEY, L.R.C.P., &c.

There has not been any case of infectious disease on any vessel.

The hospital ships, "Betsy" and "Hope," have been kept in readiness for any emergency that might have arisen.

The Port Inspector has inspected 677 vessels during the year. Various defects were met with, including choked water closets and badly ventilated cabins. All were remedied by the owners on attention being drawn to them.

MALDON.

Medical Officer of Health—H. R. BROWN, M.D.

During the year 1,114 vessels with an aggregate tonnage of 50,121 tons have entered the port, of these 26 came from foreign parts and 1,088 came coast wise

ii.

All were inspected but no sanitary defects were found nor did any deaths or cases of infectious disease occur.

In view of the prevalence of Small-pox in that locality, all vessels from Tyne ports were personally inspected by the Medical Officer of Health. The isolation hospital at Heybridge, belonging to the Maldon Joint Hospital Board, is now available for the reception of cases of infectious disease, and arrangements have been made by the Board for the speedy erection, if necessary, of a temporary Small-pox hospital, which would also be available for use by the Port Sanitary Authority.

II. URBAN SANITARY DISTRICTS.

BARKING.

Medical Officer of Health—C. F. FENTON, L.R.C.P., M.R.C.S.

Population, 1901 census	..	...	21,547
„ 1903 estimated...	...	...	25,000
Deaths registered in the district	...	...	322
Corrections	...	Additions	35
„	..	Deductions...	0
Mean for 12 years, 1891—1902.			
Nett Death-rate	...	1903.	17.1
Zymotic Death-rate	...	3.24	3.58
Infantile Mortality	...	113.2	160.6
Birth-rate	...	34.2	40.3
Cases of Infectious Disease per			
1,000 population	...	13.64	11.2

The report is printed and includes a statement prepared by the Inspector of Nuisances, 41 pages in all.

Water Supply. No complaints have been made as to the quality of the water supplied by the South Essex Water Company, nor have any cases of disease been traced to drinking water. There appears to be no probability of the provision of a public supply of water for Creeksmouth, which is greatly to be regretted.

In September a case of illness occurred in a house in which there was an improperly covered cistern. From the analysis of the water by Dr. Thresh it was clearly demonstrated that a very considerable and dangerous amount of pollution took place in the cistern. Where possible the drinking water in this district is taken direct from the main.

Food and Milk Supply. Systematic inspection of the food on sale has been made, but no seizures have taken place.

Six samples of milk were bacteriologically examined by Dr. Thresh in August, and three of these were found to show

evidence of faecal contamination. Of 32 samples submitted to the Public Analyst, deficiency of fat was found in four cases, and excess of water in three.

A conference was held in September with all the milk-sellers in the town on the question of providing a supply of sterilised humanized milk for infants. No definite arrangements have yet been made.

Some improvement has been effected of late years in the condition of the cowsheds in the district, but the state of some of them still leaves much to be desired.

Bakehouses. These are kept under supervision and the Council's regulations enforced. There are now no underground bakehouses in use in the district.

Slaughterhouses. There are three registered slaughterhouses in use, and one licensed. The latter is modern and kept in good order, but the former are old-fashioned. A public abattoir is suggested.

Watercourses. No complaint has been received as to the condition of the river Roding. The heavy floods have completely cleared the bed from all traces of the pollution of former years, and the improved condition of the Thames has assisted in diminishing the pollution of the Creek water. The same remarks apply to the other watercourses in the district.

Inspection of District. This is made systematically. The condition of the older property is thoroughly investigated from time to time. A table is given showing its present condition and requirements, also a list of houses with defective drains.

Factory and Workshop Act. Every workshop and work place, including outworkers' premises, has been inspected, and the conditions met with were satisfactory. There are six home-workers, who live in the district but work for persons outside, and three outworkers residing outside but employed by persons in the district. A register of workshops is kept.

Offensive Trades. No complaints have been received.

Sewage Disposal. No alteration has been made in this matter during the year. The Shone's ejectors both in connection

with the Kennedy Estate and Over-the-Gates are working quite satisfactorily.

Housing of the Working Classes. Houses are being erected on the same lines as formerly. In the West Ward there are cottages containing four rooms, without wash-house, and letting at 5s. 6d. per week, and the Council propose to build houses on the same lines, but larger, to be let at 5s. 3d. or 5s. 6d. The dwellings erected by the Council in 1901 let well, and at present none are empty. Dr. Fenton considers that a few tenements letting at 2s. 6d. to 3s. 6d. per week would be of great utility in housing the very poor.

Sanitary Requirements of the District:—

1. Relaying of many drains and sewers, and the provision of paving round houses.
2. More ventilation to the public sewers.
3. Sanitary tenements at low rentals for the working classes.
4. Fresh water supply for Creeksmouth and other parts of district not yet connected with public supply.
5. Public sanitary conveniences for both sexes, especially for women, in several parts of the town.
6. An improved method of dealing with the sludge at the Sewage Works.

Isolation Hospital. A new block was erected in June, consisting of two wards, each for four beds, and with a discharging block at each end of the building. It is fireproof and fitted with a constant hot water supply and with the electric light.

A fresh method has been adopted in dealing with the hospital sewage owing to the lack of success with the biological method, possibly on account of admixture with disinfectants. Deep irrigation is now in use and is at present working well.

No fencing has been erected around the grounds, nor has the land recently purchased yet been included.

Inspector's Report.

H. WOOD, Sanitary Inspector.

This report deals with the results of the systematic and other inspections. The common lodging-houses (4) have been inspected from time to time and always found to be satisfactory. The mortuary has been used for 29 bodies. More exhaustive enquiries than heretofore are now made into all cases of infectious disease notified. The bedding, &c., is in all cases disinfected by steam and the rooms fumigated with formic aldehyde or sulphur. 44 rooms have been stripped after cases of scarlet fever. 52 samples of food (chiefly milk and butter) were purchased for analysis, of which 13 were found to be adulterated. Eleven convictions were obtained, the fines aggregating £17 15s. There are 65 workshops and work places on the register. All have been inspected and found in a fairly satisfactory state. There are 39 milkshops, 4 cowsheds, and 4 slaughterhouses, all of which have been inspected.

Meat and other foods have been inspected both in the shops and in the Broadway Market on Friday and Saturday nights, but no unsound goods of any description were found exposed for sale.

BRAINTREE.

Medical Officer of Health—P. R. STEVENS, M.R.C.S., L.R.C.P.

Population, 1901 census	...	...	5,330
„ 1903 estimated	...	...	5,330
Deaths registered in the district	...	...	59
Corrections	...	Additions	9
„	..	Deductions	0
Mean for 12 years, 1891—1902.			
Nett Death-rate	...	1903. 12·8	... 16·52
Zymotic Death-rate	...	·4	... 1·33
Infantile Mortality	...	76·3	... 105·77
Birth-rate	...	22·1	... 22·68
Cases of Infectious Disease per			
1,000 population	...	·4	... 4·34

The report is in manuscript.

The water supply, from deep wells in the chalk, is good.

The sewage is delivered into tanks and dealt with by broad irrigation. The "D" card system of scavenging has been continued during the year and has been found satisfactory.

The ten bakehouses and eight slaughterhouses have been inspected and found in good order. There are no common lodging-houses in the town.

Factory and Workshop Act. There are six factories in the town and the means of escape in case of fire appear to be sufficient.

Twenty-one workshops were visited during the year. In two cases there was found to be a deficiency in the sanitary conveniences provided, which was remedied in both instances.

BRENTWOOD.

Medical Officer of Health—S. FRAZER, L.R.C.P., L.R.C.S.

Population, 1901 census	...	...	4,932
„ 1903 estimated	...	...	5,657
Deaths registered in the district	...	...	53
Corrections	...	Additions	5
„	...	Deductions	4
Mean for 4 years,			
	1903.	1899—1902.	
Nett Death-rate	...	9·5	11·46
Zymotic Death-rate	...	·7	·66
Infantile Mortality	...	84·9	124·5
Birth-rate	...	18·7	19·48
Cases of Infectious Disease per			
1,000 population	...	2·8	4·38

The report is printed and includes a summary of work done through the Sanitary Inspector.

The birth-rate is increased when allowance is made for the 600 children living at the Hackney Schools and St. Charles' Schools to 20·9.

House Accommodation is still in considerable demand, though the deficiency has been lessened. The twenty-nine cottages commenced by the Council last year under the Housing of the Working Classes Act are now completed and in occupation. Seventy-five houses in all have been completed during the year. The building bye-laws are enforced, and little difficulty is experienced in securing conformation to their requirements.

Sewage Disposal. The bacteria beds have been completed for some time, but are not yet working satisfactorily. The sewage works treat the sewage, both of Brentwood and of the parishes of South Weald and Shenfield and are managed by a Joint Committee of the Brentwood Urban and Billericay Rural District Councils. Notwithstanding this there are no less than five different sewage works, belonging to different local authorities, constructed or planned within two miles of the town. This needless multiplication of works in an area, the natural conditions of which are most favourable for a single efficient sewage system is deprecated. The ventilation of the sewers is imperfect, there being still a deficiency of manholes and flushing chambers. In about 80 per cent. of the cottages the closets are hand flushed.

Scavenging. Complaints have arisen as to the manner in which this work has been carried out by the public scavengers, and direct employment by the Council is recommended.

Water Supply is by the South Essex Water Company. The deficiency of pressure in the higher part of the district continues, but works have been commenced by the Company calculated to remedy the defect.

Supervised Premises. There is now only one common lodginghouse. Its condition and management have been satisfactory. Bakehouses and slaughterhouses are regularly inspected and have been found fairly satisfactory. Two certificates for underground bakehouses have been granted. Workshops are now registered and inspected. They are in a fairly sanitary condition.

Isolation Hospital. Cases of infectious disease are still sent to the Billericay Isolation Hospital though the accommodation there for the two districts has been found, as the result of an enquiry held by the County Medical Officer of Health under the Isolation Hospitals Act, to be insufficient. Dr. Frazer once more points out the desirability of including in the Urban District, for hospital purposes, the populated area immediately adjoining Brentwood.

BRIGHTLINGSEA.

Medical Officer of Health—E. P. DICKIN, M.D., C.M.

Population, 1901 census	...	...	4,501
„ 1903 estimated	...	...	4,640
Deaths registered in the district	...	...	58
Corrections	...	Additions	4
„	...	Deductions	0
Mean for 6 years,			
1897—1902.			
Nett Death-rate	...	1903. 13·4	... 13·58
Zymotic Death-rate	...	·65	... 1·17 (1900-1902)
Infantile Mortality	...	107·1	... 101·45
Birth-rate	...	24·10	... 25·37
Cases of Infectious Disease per			
1,000 population	...	2·37	... 6·0 (1900-1902)

The report is printed and includes a summary of work done through the Sanitary Inspector.

Sewage Works and Sewage. The works have proved satisfactory throughout the year.

The insufficiency of the flushing has been remedied by the wet weather, and in consequence there have been no complaints of no bad smells.

Scavenging has been well carried out, but the advent of really hot weather would reveal the need of a proper covered cart.

Water Supply. The water from the public supply has been analysed and the previous good reports confirmed. The recommendation of periodical examinations is repeated.

Workshops and Factory Act, 1901. There are 12 bakehouses (none underground), 25 domestic workshops, and 33 workshops total 70. The bakehouses and domestic workshops and 16 of the workshops comply with the regulations. The remaining 17 workshops, though otherwise suitable, are without sanitary conveniences.

A list of outworkers has been compiled, and the rooms in which the work is done are inspected.

Milk Supply. A certain amount of adulterated milk is sold, and this may be expected to continue until some action is taken under the Sale of Food and Drugs Acts.

Oysters. The old "ledgings" on the Hard have ceased to be used at the instigation of the Fishmongers' Company which has shown much activity in inspecting the layings. The oyster culture as now carried on is believed to be quite safe.

Isolation Hospital. A fully equipped tent hospital is provided, but has not been used during the year.

BUCKHURST HILL.

Medical Officer of Health—W. H. GIMBLETT, M.D.

Population, 1901 census	...	...	4,786
„ 1903 estimated	...	...	5,000
Deaths registered in the district	...	...	46
Corrections	...	Additions	3
„	...	Deductions	5
		1903.	Mean for 8 years, 1895—1902.
Nett Death-rate	...	8·8	12·67
Zymotic Death-rate	...	1·8	1·66
Infantile Mortality	...	88·5	123·45
Birth-rate	...	22·6	23·46
Cases of Infectious Diseases per			
1,000 population	...	2·6	5·23

The report is printed.

The district has been very free from infectious disease during the year. For two years there has been no case of diphtheria.

In consequence of the abnormal rainfall—the highest on record—floods higher than any previously recorded in the district have occurred. Some damage was done to the sewage works.

On account of an outbreak of mumps and whooping-cough the non-provided schools were closed for three weeks.

The register under the Factories and Workshops Act remains as last year and includes two factories, four bake-houses, 24 workshops, and six domestic workshops.

BURNHAM-ON-CROUCH.

Medical Officer of Health—C. F. DOWNMAN, M.R.C.S., L.R.C.P.

Population, 1901 census	...	..	2,919
„ 1903 estimated	...	...	3,200
Deaths registered in the district	...		37
Corrections	...	Additions	0
„	...	Deductions	0
			Mean for 5 years, 1898—1902.
Nett Death-rate	...	1903.	11·6
			10·52
Zymotic Death-rate	...	·9	1·96
Infantile Mortality	...	78·6	104· (four years)
Birth-rate	...	27·8	28· „
Cases of Infectious Disease per 1,000 population	...	6·56	11·03 „

The report is printed.

Housing Accommodation. Overcrowding still exists in a large number of cases, owing to so many of the houses possessing only two bedrooms.

Sewage Disposal. The bacteria beds at the Sewage Works still give excellent results. On account of the oyster industry

special pains are taken to exclude typhoid excreta from the sewers.

Scavenging is carried out regularly, the ashbins being emptied once a week.

Water Supply. The deep well in the Thanet sands continues to yield a supply of good quality. The daily yield is 28,000 gallons or 8·7 per head. This is supplemented by the supply from the superficial gravel beds which now yield water freely.

Isolation Hospital. The old cottage is kept ready if required and has been used twice during the year. A more up-to-date and commodious house is required for the district.

CLACTON.

Medical Officer of Health—JNO. W. COOK, M.D.

Population, 1901 census	...	...	7,456
„ 1903 estimated	...	...	7,649
Deaths registered in the district	...	...	105
Corrections	...	Additions	6
„	..	Deductions...	8
Mean for 12 years, 1891—1902.			
Nett Death-rate	...	1903. 13·5*	...
Zymotic Death-rate	...	·9	...
Infantile Mortality	...	98·8	...
Birth-rate	...	21·2	...
Cases of Infectious Disease per 1,000 population	...	8·0	...

The report is printed.

The district is very flat and lies generally on London clay, with some pockets of gravel.

1856·5 hours of bright sunshine were registered and 26·49 inches of rainfall.

*Dr. Cook, by excluding the deaths of all non-residents, obtains a death-rate of 11·37.

The house accommodation for the working classes is good. Plenty of modern houses of this class are vacant, while a few old timber cottages remain occupied. There is need of a greater number of houses of a good class. Building bye-laws are enforced.

The cliff protection works, costing £5,000, are now being completed and many new streets are being made up and paved.

Sewerage and Drainage. The sewers of the St. Osyth Road locality have been completed, and the main sewerage of the town is now in excellent order. All the houses are connected with the sewers and the few privies remaining will be done away with as soon as possible. The two outfalls are placed well out to sea and are satisfactory.

Scavenging. Refuse is collected by the Council's own carts. It is at present conveyed to a brickyard, but the provision of a dust destructor in the near future is recommended.

Water Supply. This is abundant and of excellent quality. Monthly chemical analyses are made. The new well and pumping station at Great Bentley will soon be finished and will replace those now in use, which are only of a temporary character. The supply is filtered and pumped to a tank on the top of a water tower.

A register of workshops is kept. There was only one underground bakehouse in the town. It could not be made suitable and a certificate of fitness under the Factories and Workshops Act, 1901, was refused.

There is no common lodginghouse in the district.

The voluntary notification of phthisis was adopted two years ago and patients' houses are disinfected with formalin.

Isolation Hospital. This is to be enlarged by an addition of ten beds and will then suffice for the needs of the district for a number of years.

CHELMSFORD.

Medical Officer of Health—H. W. NEWTON, M.R.C.S., D.P.H.

Population, 1901 census	...	...	12,580
„ 1903 estimated	...	...	13,000
Deaths registered in the district	...	...	204
Corrections	...	Additions	0
„	..	Deductions	48
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903. 12·0	... 14·53
Zymotic Death-rate	...	1·5	... 1·54
Infantile Mortality	..	97·9	... 100·83
Birth-rate	...	25·15	... 26·0
Cases of Infectious Disease per			
1,000 population	...	5·8	... 8·25

The report is printed.

The borough is amply supplied with houses for the working classes and the accommodation provided is, speaking generally, very good. There are, however, a number of old cottages which require constant supervision. Twelve have been reported on during the year as unfit for human habitation, and have been or are being repaired.

Sewage Disposal. The (joint) sewage farm at Springfield continues to serve its purpose well. The sewer in Victoria Road has given trouble through failure to empty itself properly during the excessively wet season. About 400 lineal yards of the main sewer are now laid, commencing at Baddow Road and running in the direction of Lady Lane, to drain the Greengate Estate.

The drainage of Bundick's Hill requires improvement. It is still conducted into a cesspool, the overflow from which runs in close proximity to Admiral's Park well.

Scavenging. The removal of refuse is carried out regularly and well by the Corporation. The disposal of the refuse by tipping has given rise to many grave complaints and the need for a refuse destructor is generally recognised. The former tip

by the railway opposite to Bridge Road has had to be abandoned owing to the nuisance produced.

Water Supply. The deep well in Mildmay Road yields from 50,000 to 60,000 gallons of excellent water per day, and the Burgess and Admiral's Park surface wells about 190,000 gallons at present, owing to the excessive rainfall. The total supply of 240,000 gallons per day is sufficient at present, but the yield of the surface wells is reliable neither as to quantity nor quality, and it is most desirable that an increased supply should be obtained.

Places under Supervision. Lodginghouses, slaughterhouses, bakehouses, dairies, cowsheds, and milkshops are frequently inspected, and are in a satisfactory condition.

The two underground bakehouses were specially visited and reported upon. They will be abandoned as soon as new ones are erected.

The advisability is again urged of having a veterinary inspector appointed jointly by the Urban and Rural Sanitary Authorities to make regular visits to the various dairies and cowsheds.

There are only two offensive trades in the Borough. They are very well conducted, everything possible being done by the proprietors to mitigate nuisance.

Factory and Workshop Act. There are 20 retail bakehouses, two laundries, 58 other workshops, and 80 work places in the Borough. All of these have been subjected to a special inspection, and with few exceptions, were in excellent condition. In no case was any nuisance found to exist. Three lists of outworkers were received, all in the clothing trade.

Isolation Hospitals. The Isolation Hospitals, available for the Chelmsford Rural and Urban Districts, remain as reported last year, *i.e.*, at Baddow Road, Coval Lane, and Galleywood. The building of the new Joint Isolation Hospital has not yet been commenced. Plans have been prepared and are still under consideration.

Improvements in progress or required :—

1. The building of the proposed Joint Isolation Hospital.
2. An increased water supply that will give to each house and w.c. in the Borough a constant supply of water.
3. A refuse destructor.
4. Draining and sewerage of Bundick's Hill.

CHINGFORD.

Medical Officer of Health—GEO. F. FULCHER, M.B., C.M.

Population, 1901 census	...	...	4,373
„ 1903 estimated	...	...	5,003
Deaths registered in the district	...	...	65
Corrections	...	Additions	0
„	...	Deductions	19
Mean for 8 years, 1895—1902.			
Nett Death-rate	...	1903.	...
Zymotic Death-rate	...	0	...
Infantile Mortality	...	87.0	...
Birth-rate	...	23.0	...
Cases of Infectious Disease per			
1,000 population	...	6.4	...

The report is printed.

Monthly samples have been taken of water from the Ching Brook below the Buckhurst Hill and Woodford Sewage Works. The first samples were unsatisfactory, but not the subsequent ones. The working of the Chingford Sewage Farm has been satisfactory. An additional bacteria bed is being constructed.

Scavenging. Weekly removal of bins has been carried out satisfactorily by the contractor.

Dairies, cowsheds, and milkshops have been periodically inspected and found in good condition.

The slaughterhouse drain which had an insufficient fall has been rectified and now acts well.

Factory and Workshop Act. The factory and the four workshops have been inspected twice during the year and found in satisfactory condition.

COLCHESTER.

Medical Officer of Health—W. G. SAVAGE, M.D., B.SC., D.P.H.

Population, 1901 census	...	...	38,373
„ 1903 estimated	...	...	39,300
(including 3,940 persons in the barracks)			
Deaths registered in the district	...	...	536
Corrections	...	Additions	1
„	...	Deductions	38
		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	...	12·7	.. 15·30
Zymotic Death-rate	...	·87	... 1·73
Infantile Mortality	...	125·4	... 129·98
Birth-rate	...	26·0	... 25·88
Cases of Infectious Disease per			
1,000 population	...	6·2	... 8·49

The report is printed.

Water Supply. This is derived from a deep well in the chalk at Balcerne Hill. The water is pumped to a tower and distributed by gravitation to all the urban and most of the rural parts of the Borough. A few outlying hamlets and houses are supplied by shallow wells. The quality of the public supply is good, as evidenced by regular chemical and bacteriological examinations, and the quantity amounted during the year to 16 gallons per head per day for all purposes. Negotiations are being completed for the acquisition of water rights at Lexden in order to augment the supply. A constant supply is afforded and the mains have been extended 1,563 yards during the year.

Sewage Disposal. The new sewage works at the Hythe were opened in June. They are constructed at the site of the old sewage outfall works and by their means sedimentation and bacterial treatment are substituted for a chemical precipitation method. The average amount of sewage dealt with is about 1,000,000 gallons per day. (*Vide* Sewage disposal works.)

House Accommodation. A systematic house-to-house inspection has been commenced and has revealed the existence of 14 houses so dilapidated as to be unfit for human habitation. Of these nine have been voluntarily closed and the remainder repaired. Overcrowding of houses on space is notably absent in the Borough.

Premises under supervision. The one common lodginghouse has been regularly visited. Its management is satisfactory.

Factory and Workshop Act. There are now on the register 20 domestic workshops, 46 retail bakehouses, 2 laundries, and 213 other workshops. The industries carried on are almost entirely clothing and boot manufacture. The general condition of the workshops is fairly good.

All the underground bakehouses, four in number, have been specially visited and reported upon. One has been altered and certified as fit for use, the others have been abandoned.

Lists of outworkers were received from 45 employers. All relate to the clothing trade and they include 1,007 names.

Fifteen premises were found unwholesome and cleansed, and four were found quite unfit. Work was prohibited on account of infectious disease in twenty cases, in 13 for Scarlet Fever and in 7 for Small-pox.

Isolation Hospital. The accommodation provided has been able to meet all demands upon it.

The consent of the Local Government Board has been obtained to a loan of £2,960 for improvements at the hospital.

These will include a porter's lodge, a steam disinfecter, improved laundry appliances, and machinery and pipes for supplying hot water, all of which are urgently required.

The iron Small-pox hospital accommodated all the 24 cases which occurred. A number of tents were erected by the side of the hospital, and a few of the convalescents were transferred to them. With these tents accommodation was ample.

EAST HAM.

Medical Officer of Health—A. W. BEAUMONT, B.A., M.D.

Population, 1901 census	...	...	96,018
„ 1903 estimated	...	...	110,451
Deaths registered in the district	...	...	1,133
Corrections	...	Additions	132
„	...	Deductions	0
			Mean for 12 years, 1891-1902.
Nett Death-rate	...	1903. 11.5	... 13.67
Zymotic Death-rate	...	1.6	... 2.61
Infantile Mortality	...	113.0	... 149.08
Birth-rate	...	34.4	... 35.40
Cases of Infectious Disease			
per 1,000 population	...	9.7	... 11.04

The report is printed.

The subsoil is sand and gravel overlying the London clay; some of the southern parts of the district and of the Roding valley are marshy.

The principal industries are the Beckton Gas and Chemical Works, the Royal Albert Docks, bus and tramway depôts, &c.

Water Supply. This is from the East London Waterworks Company, and is mainly derived from deep wells. The water is of excellent quality, and the consumption is about 28 gallons per head per day. The supply is constant.

Cemeteries. There are five large cemeteries, covering over 250 acres, situated in the northern part of the district, and

two churchyards are also used for burial purposes. All are satisfactory.

The condition of the River Roding has given little cause for complaint, largely owing to the abnormal rainfall.

Plans for 1,202 new houses have been approved during the year, the average for the past five years being 1,806.

A scheme has been inaugurated for the construction, under the Housing of the Working Classes Act, of some 350 tenement houses. Over 100 are now occupied. The situation is near the docks and gasworks, and the accommodation is excellent, with electric light and constant water supply. The rents range from 6s. 3d. to 7s. 6d. per week, which renders the scheme self-supporting.

Many inspections have been made under the Customs and Inland Revenue Act, 1890, on application from the owners for exemption certificates from Inhabited House Duty. These have been granted in 164 cases, where the houses were constructed so as to afford suitable accommodation for each of the families or persons inhabiting them, and where due provision was made for their sanitary requirements. A very large number of applications have been refused.

Bakehouses. There are 52 bakehouses in the district, of which a list is furnished. Twelve of these are underground, and were all carefully inspected with a view to certification. Only one of the twelve attained the required standard in respect of (1) natural light during the day time, (2) efficient means of ventilation, (3) sound dry walls, (4) sufficient head room, (5) impervious, smooth floors, and (6) portable troughs. In most cases there was a deficiency of light and ventilation, but the owners were found willing to carry out the suggestions made, and in no case was it necessary to withhold the certificate.

Slaughterhouses. The 14 slaughterhouses in the district have been regularly inspected.

Factory and Workshop Act. Much time has been devoted to the systematic inspection of factories and workshops. The

nuisances discovered have in every instance been abated, and no difficulty has been experienced in enforcing the provisions of the Act. There are 164 factories and workshops on the register, and information has been received from other districts as to some 310 outworkers, whose premises have been inspected in every case.

Open spaces, &c. There are five parks, comprising 160 acres, and several acres of allotments, which are much appreciated. A new park, comprising 15 acres, was opened at Beckton in June, and a large open air swimming bath in the Central Park was also opened during the year.

A large number of up-cast shafts for sewer ventilation have been erected during the year.

New bye-laws have been drawn up for the purpose of more stringent sanitary administration, especially in connection with the construction of new buildings.

An Act of Parliament, conferring additional powers on the East Ham District Council, received the Royal assent last August. The sanitary clauses include (1) a section defining drains and sewers and making combined drains repairable at the owner's expense, (2) power of enforcing urinals in connection with all refreshment houses, and greater powers with respect to private urinals generally, (3) provision for the paving of back passages and alleys, (4) power of enforcing suitable sanitary dustbins.

Scarlet Fever Hospital. This is a temporary building, containing 32 beds, and there is also a Convalescent Home for this disease in the Central Park, containing 28 beds. Owing to the rapid growth of the district the hospital accommodation is now found insufficient, and plans and estimates have been agreed to for a new permanent Scarlet Fever Hospital, containing 60 beds.

EPPING.

Medical Officer of Health—T. FOWLER, L.R.C.P. & S.I.
D.P.H. Camb.

Population, 1901 census	...	...	3,789
„ 1903 estimated	...	...	3,918
Deaths registered in the district	...		59
Corrections	...	Additions	1
„	...	Deductions	25
			Mean for 6 years, 1897-1902.
Nett Death-rate	...	1903. 8·9	... 15·12
Zymotic Death-rate	...	·8	... 1·55
Infantile Mortality	...	133·3	... 108·6
Birth-rate...	...	19·1	... 26·18
Cases of Infectious Disease			
per 1,000 population	...	2·3	... 6·60

The report is printed.

Sewers and Drainage. The new sewer in the Station Road, in connection with the southern outfall, has been completed. Most of the houses here, as well as at Allnutt's Estate and Coopersale Common, have been connected with the different sewers. It is anticipated that the whole of this work will soon be completed. Several houses have also been connected with north-western outfall during the year, and the old faulty methods of drainage have been done away with.

Sewage Disposal. The land both at the southern outfall and the Railfield sewage farm is unsuitable, being a stiff impervious clay, and, in consequence, the working is unsatisfactory. A deputation of the Council has visited the sewage works at Sutton, and in consequence of their favourable report the adoption of the biological method of purification is now contemplated.

Water Supply. This is almost entirely in the hands of the Herts and Essex Waterworks Company, who provide an exceptionally pure chalk water, derived from deep wells. There was considerable deficiency in the supply last summer, believed to be due to inadequacy of machinery and storage.

Additions to both are in progress or contemplation, and the Council has effected an agreement between the Herts and Essex and the East London Companies to unite their mains at Abridge.

House Accommodation. Twenty of the worse houses have either been put into habitable repair or closed in consequence of the Council's action, and a further list is now being dealt with. Forty-four of these were found to require improvement. In several instances, in consequence of the Council's previous action, improvements were already being carried out.

The scarcity of cottages still continues, and much overcrowding occurs in consequence.

Scavenging. House refuse is collected monthly, and as many complaints are received a fortnightly collection is recommended.

FRINTON.

Medical Officer of Health—H. W. GODFREY, M.D., M.R.C.S.

Population, 1901 census	...	...	646
„ 1903 estimated	...	...	300
Deaths registered in the district	...	...	4
Corrections	...	Additions	0
„	...	Deductions	0
Mean for 3 years,			
	1903.	1900—1902	
Nett Death-rate	...	...	3·2
Zymotic Death-rate	...	...	11·84
Infantile Mortality	...	...	1·2
Birth-rate	...	...	0
Cases of Infectious Disease per	...	...	167
1,000 population	...	...	22·5
	...	...	27·92
	...	...	1·0

The report is type-written.

The district is growing rapidly. Many new houses are being erected, and the Council intends to control the construction of these by means of new bye-laws stricter than those already in force.

The population, which is estimated at 800, is increased by visitors in the summer months to almost 3,000.

The drainage is in good order, the outfall being into the sea and giving rise to no complaints. A septic tank, previously used as a temporary measure, has been disconnected upon the completion of the new sewer.

The removal of house refuse is carried out by a contractor, movable receptacles being in use in nearly every instance.

The water supply from the Tendring Hundred Water Co. is now ample and of good quality.

GRAYS.

Medical Officer of Health—J. A. WARD, L.R.C.P., M.R.C.S., L.S.A.

Population, 1901 census	...	...	13,834
„ 1903 estimated	...	...	14,750
Deaths registered in the district	...	...	144
Corrections	...	Additions	19
„	...	Deductions	2
		Mean for 12 years,	
		1891—1902.	
Nett Death-rate	...	1903.	...
Zymotic Death-rate	...	10.9	12.01
Infantile Mortality	..	1.4	2.50
Birth-rate	...	95.2	127.42
Cases of Infectious Disease per	...	34.2	31.08
1,000 population	...	4.6	13.36

The report is printed.

The district comprises an area of 1,382 acres, the soil being gravel and alluvium overlying a deep substratum of chalk.

The population consists chiefly of the working classes, who are employed mainly at the neighbouring cement works, Tilbury Docks, and in the building trade.

A great demand still exists for houses suitable for the working classes. Those erected let at 8s. to 10s. per week (and a few small ones at 7s.) and are consequently beyond the

means of the average labourer, whose wages in this district may be taken at 23s. per week. The Council have erected 25 houses as an experiment, but not being able to let them at a lower rent than 8s. per week, have decided to build no more.

Water Supply. Water is supplied almost entirely by the South Essex Water Company. It is derived from springs at Linford, and deep wells in the chalk. Though of great organic purity the hardness, 18—30 degrees, is too high for a public supply. The supply was constant throughout last year.

Sewage Disposal. All the houses in the district, with 58 exceptions, are now connected with the sewers. Ninety-four were connected last year. The erection of ventilation shafts has been completed. No complaints have been received of smell arising from the sewer manholes, nor, since the bacteriological method of treating the sewage has been adopted, have any complaints been made by the Thames Conservancy as to the quality of the effluent. The nuisance arising from smells at the works has been greatly diminished since the alteration, but not entirely obviated, though it is hoped that this object will be attained by covering over the distributing channels to the bacteria beds, and by other measures which are being taken. A new 15in. intercepting sewer and a 30in. outfall surface water drain are being constructed to prevent flooding, which occasionally occurs in the lowest lying part of the town during heavy rainfall.

House refuse is collected weekly by the Council and burnt in a "Meldrum" destructor, upwards of 2,500 tons being dealt with annually.

Factory and Workshop Act. There are 65 workshops in the district. All have been inspected during the year, and the sanitary defects found, remedied.

Premises under Supervision. There are 23 milk purveyors and three cowkeepers in the district. Of the former, nine are milk-shops proper, and are, generally speaking, satisfactory. The remaining 14 are small general shops in which the conditions

assist the windmill in raising the sewage is still under consideration.

Several fresh manholes have been put in during the year. The relaying of the sewer on the south side of the High Street is still held over on the ground of expense, but it is a matter that must be faced in the near future.

House refuse is collected by the Council, partly by their own men and partly by contract. It is in great part ploughed into land, but some, to save expense in carting, is shot into gravel pits, which are largely used by children as playgrounds.

Factory and Workshop Act. There are 48 premises on the register including 15 bakehouses. The only underground bakehouse in the district has been done away with. Several minor defects in the workshops and bakehouses, discovered on inspection, have been remedied. The list of outworkers is not yet prepared.

HARWICH,

Medical Officer of Health—HAROLD GURNEY, L.R.C.P.,

L.R.C.S.

Population, 1901 census	...	...	10,070
„ 1903 estimated	...	...	10,353
Deaths registered in the district	...	...	93
Corrections	...	Additions	5
„	...	Deductions	0
Mean for 12 years, 1891—1902.			
Nett Death-rate	...	1903. 9.5	13.67
Zymotic Death-rate	...	2	1.11
Infantile Mortality	...	85.7	127.33
Birth-rate	...	30.4	32.40
Cases of Infectious Disease per			
1,000 population	...	2.5	5.07

The report is printed.

Sewage Disposal. The scheme for providing a high level storage sewer reservoir to prevent flooding has been abandoned, and instead a relief valve, opened during heavy rains,

has been fixed at the outlet of the old storage reservoir. This has so far proved effectual.

A new sewer is soon to be laid from Maria Street to the pumping station, which will prevent the flooding of the basements of the houses in the Bathside district, which now frequently occurs after heavy rain.

The main drain in the First Avenue, Dovercourt, requires ventilation.

Water Supply. During the summer the Tendring Hundred Water Company inaugurated their new high level water service, having built a new water tower about 100 feet in height. There are now few complaints of shortage of water, even from the most lofty houses in the Borough.

The water of several wells having been analysed and found unfit for drinking, town water has been laid on in each case, and the wells closed.

Factory and Workshop Act. A large number of inspections have been made, but no defect found, the workshops being clean, well ventilated, and spacious. There are hardly any outworkers. There are two underground bakehouses, both suitable for the purpose, being well lighted and well ventilated.

ILFORD.

Medical Officer of Health—C. F. STOVIN, M.A., D.P.H.

Population, 1901 census	...	...	41,229
„ 1903 estimated	...	...	54,226
Deaths registered in the district	...	...	828
Corrections	...	Additions	27
„	...	Deductions	357
Mean for 12 years, 1891-1902.			
Nett Death-rate	...	1903. 10·0	12·23
Zymotic Death-rate	...	1·3	2·73
Infantile Mortality	...	92·6	128·0
Birth-rate	...	30·7	28·80
Cases of Infectious Disease			
per 1,000 population	...	6·7	11·07

The above rates for 1903, with the exception of the cases of infectious disease per 1,000 population, are not calculated upon the total estimated population, but on a nett population of 49,646, obtained by deducting from the total the following institutional populations:—

Dr. Barnardo's Homes ...	...	1,000
Claybury Asylum ...	...	2,660
West Ham Asylum ...	...	920
		<hr/>
		4,580
		<hr/>

The report is printed.

The surface of the district generally is gently undulating. The subsoil is gravel for the most part, but in some portions the underlying London clay comes to the surface, and in one area it is covered by brick earth.

Milk Supply. Cowsheds and Dairies. The Dairies and Milkshops Order of 1885 is made use of to prevent the establishment of dairies except where premises and appliances are suitable. With regard to the quality of the milk itself very little efficient control is exercised. The administration of the Food and Drugs Acts is in the hands of the County Council, and its transference, at any rate as regards milk, to the District Council is suggested.

The new Improvement Bill before Parliament contains a number of clauses designed to secure the more efficient control of the milk industry. These include powers to take samples and inspect cows both within and without the district, to require dairymen to furnish lists both of milk supply and of customers, and to notify disease both amongst their servants and their cattle, &c., &c.

There are 6 cowsheds and 37 dairies registered in the district. Two of the former are unsatisfactory and will be dealt with.

The great bulk of the meat consumed in Ilford comes from the Smithfield Market. The four local slaughterhouses, which

are licensed annually, deal mainly with pigs and sheep. One of them is satisfactory; the others are not up to a high standard, but are carefully looked after. Frequent inspections are made, and only a small joint of pork has been condemned.

Frequent inspections of fish shops and vegetable and fruit shops are made. Some small consignments of fish, and 50lb. of apples were condemned.

There are no offensive trades in the district.

Twenty-six samples have been taken under the Food and Drugs Act during the year; none of these proved to be adulterated. It is intended to take a great many more samples during 1904.

Factory and Workshop Act. There are 32 factories in the district, and 250 workshops and workplaces on the register. Two notices under the Public Health Act were served and complied with. Notices of outworkers have been sent to and received from other authorities, and a list of outworkers kept.

There are 28 bakehouses in the district. Of the two underground bakehouses, one has been closed, and the other altered so as to meet the requirements of the Council. Frequent inspections have been made, and five notices served.

Water Supply. The district is supplied by the East London Water Company in all that portion north of the Cranbrook road, including Fencepiece. Analysis has given satisfactory results.

The other portion of the district is supplied by the South Essex Water Company. This water has given a much better result on analysis than before. The Company is sinking a well in the Roding Valley in this district.

Housing of the Working Classes Acts. There is little overcrowding at the present time. Proceedings under Part II. of the Housing of the Working Classes Act, 1890, have been taken with regard to four cottages, and the owner is taking steps to make them habitable. A few old and undesirable cottages are let at about 6s. a week, and readily find tenants

on account of the rent. Cottages at a rental of about 5s. per week are much wanted.

There are no common lodginghouses in the district.

House refuse is collected once a week throughout the whole district, and this work is now carried out by the Council as it has been found cheaper to do so than to give the work to contractors. The refuse is taken to brickfields, and, on account of the character of the season, this has not given rise to so much trouble during the past.

Sewerage and Drainage. With the heavy rainfall the sewers have been taxed beyond their capacity in certain portions of the district during the year. The following relief works have been carried out in consequence:—

1. Extension of sewer through Gordon Road and Connaught Road, to relieve the flooding in Oaklands Park Avenue.

2. A new sewer in Albert Road and Sunnyside Road.

3. An overflow sewer from the Northbrook Road sewer to the low-level sewer in Westbury Road.

The extension of sewage works was begun during the year. Two precipitation tanks are being laid down, and a storm-water roughing filter, which will be finished during the present year.

Various clauses relating to drainage have been included in the Bill now before Parliament.

LEIGH-ON-SEA.

Medical Officer of Health—W. DOUGLAS WATSON,

M.R.C.S., L.R.C.P.

Population, 1901 census	...	...	3,667
„ 1903 estimated	...	...	4,064
Deaths registered in the district	...		40
Corrections	...	Additions	0
„	...	Deductions	0

		1903.		Mean for 6 years, 1897-1902.
Nett Death-rate	...	9.8	...	13.42
Zymotic Death-rate	..	.5	...	3.48
Infantile Mortality	...	63.06	...	102.72
Birth-rate	...	27.3	...	26.78
Cases of Infectious Disease				
per 1,000 population	...	3.9	...	17.97

The report is printed.

The exceptional quantity of storm water, which has had to be dealt with owing to the excessive rainfall, has caused a difficulty owing to the discharge of effluent being dependent on the state of the tide. This has been remedied to some extent by the construction of a reservoir at the sewage works. The effluent on the whole is satisfactory.

Many of the houses in the old town are without w.c.'s, and some which have w.c.'s have no flushing apparatus.

There have been constant complaints as to inefficient dust removal, and in many instances proper receptacles for dust are not provided.

Water Supply. An additional reservoir has been constructed, capable of holding 100,000 gallons. Since the installation of the air-lift in 1902 a better supply of water has been maintained—about 8,000 gallons per hour. The provision of an auxiliary supply, which would render intermissions unnecessary, is under consideration.

Factory and Workshop Act. There are no large factories. Various workshops and workplaces have been inspected.

Isolation Hospital. The only accommodation available at present is that provided by a small cottage rented for the purpose, which would suffice for one or two cases. The matter has been referred to a committee, which has reported from time to time to the Council, but has as yet decided on no scheme.

LEYTON.

Medical Officer of Health—A. F. PESKETT, M.R.C.S.

Population, 1901 census	...	...	98,912
„ 1903 estimated...	...	...	102,000
Deaths registered in the district	...	...	1,976
Corrections	...	Additions	0
„	...	Deductions...	864
			Mean for 12 years,
			1891—1902.
Nett Death-rate	...	1903.	10.9
Zymotic Death-rate	...	...	1.6
Infantile Mortality	...	...	98.4
Birth-rate	...	...	32.1
Cases of Infectious Disease per	...	...	...
1,000 population	...	7.2	10.94

The report is printed.

Sewerage. During the year 104 vent shafts have been erected, and various alterations and additions have been made to the sewers in the district.

Cowsheds and Dairies. There are now 11 cowsheds in the district, two having been closed during the year. These have been periodically inspected, special attention being paid to the question of cleanliness. Seven milk dealers have been registered. Several cases of infectious disease occurred during the year in the houses of persons engaged in the milk trade. They were compelled to remain away from their employment until the risk of spreading the infection was over.

Slaughterhouses. There are 19 slaughterhouses in the district, two having been closed and one newly licensed during the year. They have been visited from time to time and the cleansing of the walls and renewal of receptacles for offal have been insisted on.

Unsound Food. Large quantities of fruit, 342 lbs. of fish, and over 3,000 eggs have been destroyed as unfit for human consumption.

Housing of the Working Classes Act. Seven houses were closed as unfit for habitation; two have since been repaired by the owners and are now occupied, but the other five are finally closed.

Numerous complaints have been made by occupiers of adjacent houses owing to the insanitary state of roadways at the rear of shops. These should be properly paved and drained before the premises are passed as fit for occupation.

Factory and Workshop Act. There are 97 workshops on the register, the principal industries being connected with the clothing trade. The workshops and the homes of 143 out-workers have been inspected as to their sanitary condition, special attention being given to the cleanliness of the work-rooms, the prevention of overcrowding and the condition of the sanitary arrangements. In 31 cases overcrowding and filthy conditions were found to exist and in 33 cases sanitary defects. Notices were served on the owners or occupiers and the nuisances abated.

Bakehouses. These are in a satisfactory condition. Eight underground bakehouses have been closed as unfit for the purpose and the remainder certified on completion of the necessary alterations.

Isolation Hospital. 206 cases of Scarlet Fever have been admitted to the temporary isolation hospital, where there are 40 beds available for this disease, and 48 cases of Diphtheria, for which 10 beds are available. This hospital has been throughout the year inadequate to deal with all the cases of Scarlet Fever and Diphtheria that had to be removed.

In April the Local Government Board sanctioned a loan for £3,625 for 50 years to defray the cost of the site for a permanent hospital at Oliver Road on condition that the site should not be used for a Small-pox hospital. Since then a sub-committee has been appointed to visit two or three towns where hospitals have recently been erected, and tenders of £403 12s. 3d. for fencing and £60 8s. 6d. for planting trees

have been accepted, and a loan for these amounts sanctioned. This work has now been completed.

There are in the Infirmary, Whipps Cross Road, 80 beds devoted to phthisis patients, 56 for males and 24 for females. There is a large staff of nurses, no pauper help being allowed, and the accommodation for phthisis is of an exceptionally up-to-date kind.

LOUGHTON.

Medical Officer of Health—A. B. HARRIS, M.A., M.B.,
B.CH., Oxon.

Population, 1901 census	...	...	4,730
„ 1903 estimated	...	...	5,000
Deaths registered in the district	...	...	43
Corrections	...	Additions	0
„	...	Deduction	1
Mean for 3 years,			
1900 1901 1902.			
Nett Death-rate	...	1903.	...
	...	8.4	9.5
Zymotic Death-rate	...	1.0	.98
Infantile Mortality	...	85.9	136.23
Birth-rate	...	25.6	26.63
Cases of Infectious Disease			
per 1,000 population	...	6.6	7.47

The report is printed.

Sewage Disposal. The water carriage system is in use throughout the greater part of the district. The purification at the outfall works is hampered by want of sufficient area of land. The adoption of some bacterial method of purification will be necessary at some future date.

There are certain portions of the district, namely, Chigwell Lane, part of England's Lane, and Debden Green, which cannot be drained into the common sewers, and the houses and cottages drain primarily into cesspools. These places have received particular attention, and their condition is on the whole satisfactory.

Scavenging. Refuse is removed fortnightly by a public scavenger, and is dealt with at the sewage farm.

Water Supply. This is derived from the East London Waterworks Co.'s deep chalk wells and is abundant, but hard. There are no surface wells.

There are no common lodginghouses in the district.

Bye-laws relating to slaughterhouses, cowsheds, dairies, milkshops and piggeries came into operation in June. All the premises affected were inspected during September, when instructions for necessary alterations were given. These were met in a kindly spirit, and great sanitary improvements have been effected without legal assistance.

Factory and Workshop Act. There are 25 workshops on the register. All have been inspected during the year, and defects pointed out and remedied.

MALDON.

Medical Officer of Health—H. REYNOLDS BROWN,

M.D., C.M.

Population, 1901 census	...	...	5,565
„ 1903 estimated	...	...	5,599
Deaths registered in the district	...	...	104
Corrections	...	Additions	0
„	...	Deductions	30
Mean for 12 years, 1891-1902.			
Nett Death-rate	...	1903. 13.2	...
Zymotic Death-rate	...	...	1.69
Infantile Mortality	...	76.4	...
Birth-rate	...	28.0	...
Cases of Infectious Disease			
per 1,000 population	...	3.21	...

The report is type-written.

Water Supply. The water supply is from deep wells in the Greensand underlying the London clay, and is of good quality. The quantity, however, is insufficient, amounting to less than

ten gallons per inhabitant daily, and, as it is necessary to increase the number of w.c.'s in use, some augmentation in the supply is imperative.

Sewage Disposal. The sewage is discharged in a crude state into the estuary of the River Blackwater. It is impossible to make it all discharge at a single outfall, but it is to be hoped that at the main outfall at least, which deals with about five-sixths of the total, it may soon be possible to establish some form of bacterial filter.

The privies which still remain in use are, for the most part, in a ruinous condition, and the surrounding soil polluted by sewage. Their number is, however, being reduced year by year, and the great bulk of the houses are water-closeted. In spite of this 29 out of the 56 cases of Typhoid Fever contracted in the town during the last six years have arisen in houses with privies.

The old-standing nuisance arising from a sewage polluted ditch behind Foundry Terrace has at last been remedied, by the diversion of the sewage into a properly made sewer.

House Refuse is collected from ashpits by the borough carts at the request of occupiers. The increased adoption of sanitary dustbins, along with systematic collection of their contents, is very much to be desired.

House Accommodation. Some of the older houses are very ill-built and deficient in air space and ventilation. Many of them are overcrowded owing to want of houses at a low rent. Some building has been going on, and the building bye-laws have been strictly enforced.

Factories and Workshops. There are only two factories of considerable size. The workshops have been systematically inspected, and the few defects found have been remedied voluntarily. The bakehouses are satisfactory and none are underground.

Isolation. The new hospital at Heybridge, provided by the Joint Hospital Board for the Borough and for the northern part of the Maldon Rural District, has been open since the beginning

of December. It contains ten beds, arranged for the reception of two diseases at the same time, an ample administrative block, an ambulance, and steam disinfecter. Disinfection of bedding and clothing is carried out here at the expense of the Borough. Rooms are disinfected by formalin spray.

ROMFORD.

Medical Officer of Health—A. WRIGHT, M.D.

Population, 1901 census	...	...	13,656
„ 1903 estimated	...	...	14,400
Deaths registered in the district	...	...	241
Corrections	...	Additions	1
„	...	Deductions	73
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903. 11·7	... 13·76
Zymotic Death-rate	...	·2	... 1·82
Infantile Mortality	...	99·1	... 116·59
Birth-rate	...	29·4	... 31·36
Cases of Infectious Disease per			
1,000 population	...	5·4	... 12·26

The report is printed.

The bakehouses and slaughterhouses have been inspected and found in a satisfactory condition.

The South Essex Water Company's water has been laid on to a few houses where the drinking water was found on analysis to be impure.

Periodical inspections of the district have been made, and at the end of the year it was in a healthy condition.

Thirty-six cases of Scarlet Fever, Diphtheria, and Enteric Fever from the Urban district were admitted into the Isolation Hospital, and among these only one death occurred (from Diphtheria). The hospital is in a most satisfactory condition.

SAFFRON WALDEN.

Medical Officer of Health—W. ARMISTEAD, M.B.

Population, 1901 census	...	...	5,896
„ 1903 estimated	...	...	5,854
Deaths registered in the district	...	...	99
Corrections	...	Additions	0
„	...	Deductions	27
Mean for 12 years, 1891—1902.			
Nett Death-rate	...	1903. 12·3	...
Zymotic Death-rate	...	0	...
Infantile Mortality	...	74·1	...
Birth-rate	...	18·4	...
Cases of Infectious Disease per			
1,000 population	...	2·9	...

The report is printed and includes a special report on the administration of the Factories and Workshops Act in the Borough during last year.

The geological formation is upper chalk, covered on the higher ground with boulder clay. The elevation above sea level varies from 150 to 400 feet.

The principal industries carried on are malting, cement making, and the manufacture of clothing.

House accommodation for the working classes is fairly adequate, the number of inhabited houses being on the increase while the population is diminishing. Most of the cottages have a sufficiency of open space and cleanliness of surroundings is enforced as far as possible. Five per cent. of the inhabited houses have less than three rooms, 10 per cent. less than four, and 30 per cent. less than five. Building bye-laws are enforced. Four cases of overcrowding were reported during the year, and some action under the Housing of the Working Classes Act may be necessary.

Sewerage and Drainage. The sewage scheme of which particulars were given in the report for 1902 has not been proceeded with owing to difficulty in acquiring the land, and the discovery by the Council's engineers of a discrepancy in the level at the outfall works.

Most of the houses are drained into the existing sewerage system, but there are some earth closets and privies which will be done away with as soon as the proposed new sewers are provided.

House refuse has for the last four years been removed by the Council's scavengers once a week by the method known as the "D" card system, and with beneficial results.

Water Supply is derived from a deep well bored into the chalk in 1899 to the depth of 350 feet and lined with steel tubes, $8\frac{1}{2}$ inches internal diameter. The water undergoes a softening process by which the hardness is reduced about one half. The water level in the chalk, which had sunk about $9\frac{1}{2}$ feet during the recent dry seasons, rose last November to within one foot of its former level.

Supervised Premises. There are no common lodginghouses in the district. The dairies, cowsheds, and milkshops, 37 in all, have been inspected and found fairly satisfactory. The slaughterhouses have all been inspected by the Medical Officer of Health in conjunction with the Borough Surveyor. Most were found structurally defective and notices were served to have the defects remedied. These have in all cases been complied with. The bakehouses are in a satisfactory condition. There are now 78 workshops on the register and in nine of them inspection has led to the discovery and remedy of sanitary defects.

Infectious cases are removed to the Isolation Hospital, which is the joint property of the Saffron Walden Urban and Rural districts.

SHOEBURYNESSE.

Medical Officer of Health—E. W. WALTER, M.R.C.S., L.R.C.P.

Population, 1901 census	...	...	4,081
„ 1903 estimated	...	...	4,275
Deaths registered in the district	...		41
Corrections	...	Additions	3
„	...	Deductions	0

		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	...	10.3	12.85
Zymotic Death-rate	...	.94	2.43
Infantile Mortality	...	92.5	145.07
Birth-rate	...	40.5	34.20
Cases of Infectious Disease per			
1,000 population	...	4.7	9.48

The report is in manuscript.

The soil of the district is principally clay and gravel, country flat and fairly well wooded. The chief industries are brick-making, agriculture, and employment on the government works.

There is a constant public supply of exceptionally pure water derived from an artesian well.

The district is drained into two main sewers, which discharge into the sea. Part of the system is provided with automatic flushing tanks. Nearly all the w.c.'s are connected with the sewers. There are a few earth closets, which are emptied three times a week. The ashpits are emptied twice a week.

The general condition of the housing of the working classes is satisfactory; overcrowding becomes less frequent as building progresses.

The dairies and cowsheds are in a satisfactory condition.

All workshops and work places, including the three bake-houses in the district have been inspected, but no register has as yet been compiled.

The isolation hospital at Sutton Ford Bridge has been of great advantage to the district.

SOUTHEND.

Medical Officer of Health—J. T. C. NASH, M.D., D.P.H.

Population, 1901 census	...	28,857
„ 1903 estimated...	...	37,283
Deaths registered in the district	...	448
Corrections	...	Additions ... 17
„	...	Deductions... 22

		1903.	Mean for 11 years, 1892-1902.
Nett Death-rate ...	...	11.88	14.48
Zymotic Death-rate ...	...	1.05	2.43
Infantile Mortality ...	...	118.71	148.73*
Birth-rate ...	...	25.07	26.82*
Cases of Infectious Disease			
per 1,000 population ...	...	6.36	9.5

*The Medical Officer of Health gives the Infantile Mortality and the Birth-rate for the 12 years 1891-1902 as 153.09 and 23.65 respectively.

The report is printed.

Sewerage and Drainage. The proposed main sewer for the Sea View Estate has been delayed by negotiations resulting from the necessity of carrying it through private land. These difficulties have now been overcome, and the contractor has been instructed to press forward with the extension of the Western Valley sewer, which is now in progress.

Sanction was obtained in August to borrow £1,530 for a new 12in. sewer from Fairfax Drive to Chatterfield's Lane, forming a western extension of the Prittlefield scheme. This has been constructed and the houses in Fairfax Drive and on the Westcliff Park Estate connected with it. These had discharged into cesspools, which were overflowing and polluting a stream.

The long-standing nuisance caused by Butts cesspool on the Sea View Estate will also be effectually dealt with by the extension of the Western Valley sewer.

The length of sewers laid during the year by the Corporation was 3,460 yards, and by estate owners 5,690 yards.

A new surface water drain in the High Street has been constructed at a cost of £1,450.

Housing of the Working Classes Act. The 40 working class houses, for the construction of which a loan of £10,000 was sanctioned by the Local Government Board, have been completed at a total cost of £11,637 9s. 4d., the size of certain of

the rooms having been increased beyond that provided for in the original scheme. They are to be let at the minimum rentals of 5s. 3d. per week for the smaller houses, and 6s. 9d. for the larger, the tenants paying rates.

Two condemned cottages on the Chalkwell Hall Estate and two of Hutley's cottages in Prittlewell have been pulled down. Burnt Oak Farm Cottage, which was in a dilapidated condition, has been put into habitable repair.

Premises under supervision. The only offensive trades carried on are those of rag and bone merchant and horse slaughterer. A special inspection was made during August of all premises of the former type, but little nuisance was detected. A draft code of bye-laws for their regulation is being considered.

The seven slaughterhouses have been regularly inspected; one notice was served.

The 34 dairies and 4 cowsheds on the register have been frequently inspected. Greater attention is being paid to the condition of the milk supply, both at the farms in the Borough and at the purveyor's premises. A tabular statement is appended to the report, showing the condition of the four cowsheds when first inspected and the improvements already carried out or in progress at the end of the year.

The following resolution, under the Cowsheds, Dairies, and Milkshops Order, 1885, has been passed by the Council, and comes into force on May 10th, 1904:—

“Every retail purveyor of milk shall cause every
“vessel containing milk to be protected from dust, flies,
“and other sources of contamination by means of suitable
“covers.”

Factory and Workshop Act. There are now 60 workshops and 31 bakehouses on the register, to which over 500 visits of inspection have been paid. A considerable number of workplaces, including most of the kitchen-restaurants, have also been inspected

Lists of outworkers have been received and their premises inspected.

The bakehouses have been regularly inspected, and the defects detected remedied. Three underground bake-houses have been certified on completion of the necessary improvements, and the fourth has been closed.

Education Act, 1902. The schools in the Borough have been reported on by the Surveyor as to structural condition, and by the Sanitary Department as to drainage. Some of the defects met with under the latter heading have already been remedied, and others remain to be dealt with later.

Disinfection. This is now carried out by means of formic aldehyde, either in the gaseous form or as a spray of a 1 to 2 per cent. solution, the use of sulphur having been discontinued. Steam disinfection is carried out in all possible cases.

Disposal of Refuse. No further steps have been taken in the matter of providing a refuse destructor beyond instructing the Borough Surveyor and Engineer to prepare plans and estimates. The Council has made admirable arrangements for the frequent and speedy removal of refuse from the dwelling houses, but the method of its disposal is very faulty. It is carried to the brickfields at Sutton Road, which were formerly well outside the town, but have now been built around on all sides, so that dust and flies are carried into the neighbouring houses.

Water Supply. This remains of high organic purity, though, owing to the admixture of the hard water from the lower tertiary deposits at Fobbing, no longer a characteristically soft water. The results of both chemical and bacteriological examination are uniformly good. A polluted shallow well at the Southchurch Hall Dairy Farm has been condemned and a supply from the main laid on.

WALTHAM HOLY CROSS.

Medical Officer of Health—J. DAMER-PRIEST, M.R.C.S.,

D.P.H.

Population, 1901 census	...	...	6,549
„ 1903 estimated	...	...	6,653
Deaths registered in the district	...	...	68
Corrections	...	Additions	8
„	...	Deductions	3
		1903.	Mean for 12 years, 1891-1902
Nett Death-rate	...	11.0	13.71
Zymotic Death-rate	...	1.05	1.94
Infantile Mortality	...	97.3	125.40
Birth-rate	...	27.8	28.04
Cases of Infectious Disease			
per 1,000 population	...	4.2	7.34

The report is printed.

Water Supply. The East London Waterworks Company provide a constant service from the deep well in Lea Road. This has been abundant throughout the year, and the supply from High Beech storage reservoir has not been requisitioned. Frequent chemical and bacteriological examinations of the water are made, and give very satisfactory results.

The 3in. main has been extended 233 yards to the summit of Daws Hill, and a private 2in. pipe has been laid to Upshire Hall, a distance of 416 yards.

Housing of the Working Classes. There is still great scarcity of houses suitable to the requirements of the working classes, as new building has barely kept pace with the increasing numbers to be accommodated. The recently erected cottages are of a very suitable type, but the insufficiency of their numbers leads, through sub-letting, to various sanitary evils.

Sewage Disposal. The new installation for biological treatment is now completed and in operation. In constructing it the pre-existing plant and tanks, used hitherto in connection with the former method of disposal by means of "intermittent

downward filtration," have been adapted as far as possible. (*Vide* Description of Sewage Works.)

Scavenging has been well carried out under the supervision of the Surveyor, house refuse being regularly removed.

Isolation Hospital. The newly constituted Waltham Joint Hospital Board has selected a site for a permanent hospital on the north side of Honey Lane, one and a quarter miles from the town of Waltham Abbey. Plans are in course of preparation. The temporary hospital has not been used during the year, it being found more economical to treat isolated cases elsewhere.

Factory and Workshop Act. There are 5 factories, 8 bake-houses (none underground), and 31 other workshops in the district. These have all been inspected. Full particulars, including sanitary defects found and work executed, are appended to the report.

WALTHAMSTOW.

Medical Officer of Health—J. J. CLARKE, L.R.C.P.I., D.P.H.

Population, 1901 census	...	...	95,131
„ 1903 estimated	...	...	106,290
Deaths registered in the district	...	...	1,065
Corrections	...	Additions	123
„	...	Deductions	10
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903.	11·08
Zymotic Death-rate	...	...	1·81
Infantile Mortality	...	...	113·44
Birth-rate	...	...	33·26
Cases of Infectious Disease per 1,000 population	...	...	6·18
			11·52

The report is printed.

The subsoil in the town is mainly gravel, but the London clay shows itself on the surface in various parts.

Water Supply. The supply from the East London Water Company is constant. The quality of the water supplied from July to October was found to be unsatisfactory by the Council's analyst, Mr. Leo Taylor, F.I.C. No samples were analysed for the Council during the first half of the year as there was no reason to suspect that the supply was unsatisfactory, but in July and August there was a greater amount than usual of diarrhoeal sickness in adults, followed by a much greater amount in September and October and an unusual amount of enteric. The water was suspected, and, after analysis, was pronounced by Mr. Taylor to be extremely unsatisfactory, the amount of organic matter, though largely of vegetable origin, being very excessive. Bacteriological examination confirmed this conclusion, revealing the presence of an excessive number of organisms (1,400 per c.c. in August).

Complaint was made to the Local Government Board and to the Company and the reply was made by the latter body that the samples could not have been taken properly. Some of the results of their own analysts, however, corresponded closely with Mr. Taylor's. As his reports in November were more favourable, and the excessive prevalence of diarrhoea and enteric fever had then ceased, no further action was taken.

Sewage Disposal. The whole district has a duplicate system of sewers and practically every house has water closet accommodation.

The abnormal rains during June and July caused serious flooding of the cellars of a great number of houses. Several improvements in the sewers and at the sewage works have been made to prevent a recurrence of this nuisance. A new surface water sewer has been laid down in Forest Road, Chingford Road, Hoe Street, and Queen's Road, and the soil and surface water sewers in Ashford, Cranbrook, and Brunner Roads have been reconstructed. Eight new manholes have also been constructed for flushing purposes at the heads of sewers.

No further progress has been made in the treatment and disposal of the sewage. Precipitation by the aid of lime, black ash, and iron sulphate, followed by broad irrigation over the sewage farm, of 240 acres, has sufficed, as in former years, and no serious complaints as to the quality of the effluent have been made. A considerable portion of the farm has been under drained.

Scavenging. House refuse is removed twice and in the main streets three times a week by the Council's workmen. This work has been efficiently done. Notices of the new bye-laws, requiring suitable metal dustbins, have been distributed to every householder. Compliance with this requirement is not yet general amongst the poorer inhabitants, but an improvement is taking place. A destructor will probably be provided this year. The lighting and scavenging of the roads has been invariably good.

House Accommodation. Ample accommodation is provided for the working classes, but the rents in parts adjacent to the railway stations are too high for the ordinary labourer with a family. A committee has been formed to take action under part III. of the Housing of the Working Classes Act in order to remedy this defect. It has met several times during the year, but no practical result has yet come of its deliberations, and the great difficulty is to provide a suitable house for less rent than is now charged.

All the buildings erected during the year have been thoroughly supervised by the Building Inspectors under the Surveyor, and have to conform to the bye-laws in force (Model Bye-laws of the Local Government Board).

Premises under Supervision. The Model Regulations of the Local Government Board for cowsheds, milkshops, and dairies are in operation, and are generally observed. There are 14 licensed cowsheds and 98 milksellers in the district. Repeated visits have been made during the year, and the premises have been generally kept in a satisfactory condition.

The only offensive trade carried on in the district is that of fat-boiling in the Northern Ward. No serious complaint has been made regarding it, but at times the smells were far from pleasant. It is hoped that this business as now carried on will soon have to be discontinued, for the building going on in the neighbourhood of the premises will render the keeping of pigs impossible.

Factory and Workshop Act. A register of workshops, workshop record book, and record of outworkers are kept. The premises on the register at the close of the year included 587 outworkers' premises, 49 laundries, 52 retail bakehouses, and 28 other workshops. These have been systematically visited and the remedy of any sanitary defects secured.

Seven underground bakehouses were inspected. One was closed and the remainder reconstructed.

The home work carried on is in connection with clothing, the repair of furniture, and upholstery. No action had to be taken owing to unwholesome conditions in the dwellings concerned, but in 13 cases work was temporarily prohibited owing to dangerous infectious disease in the house, and the clothing was disinfected before removal.

Isolation Hospital. The accommodation for Diphtheria has proved sufficient during the year, but many Scarlatina patients had to be refused admission, and Typhoid Fever is not treated in the Hospital at all. As a result 21 persons were found during the year to have contracted the latter disease owing to the non-removal of primary cases. The Council, recognising the inadequacy of the present accommodation, have ordered further provision to be made and plans have been submitted to the Local Government Board for a twelve bed block, with separate cubicles for acute cases and a twenty-four bed block for convalescent children. Possibly building operations may be commenced in the early summer.

Disinfection is carried out by the Council's employees and the practice of certifying that private disinfection had been carried out to the satisfaction of the medical attendant has

been put an end to by means of a circular letter addressed to all the local medical practitioners informing them that no certificate of private disinfection would be accepted by the Council as satisfying the provisions of the Infectious Diseases Prevention Act, 1890 (Sections 5 and 6).

WANSTEAD.

Medical Officer of Health—F. ARGLES, M.R.C.P., ED., M.R.C.S.

Population, 1901 census	...	...	8,303*
„ 1903 estimated	...	...	8,818*
Deaths registered in the district	...	...	104
Corrections	...	Additions	4
„	...	Deductions	3
			Mean for 12 years,
			1891—1902.
Nett Death-rate	...	1903. 11·9	... 10·49
Zymotic Death-rate	...	1·5	... 1·07
Infantile Mortality	...	89·8	... 120·12
Birth-rate	...	18·9	... 19·08
Cases of Infectious Disease per			
1,000 population	...	5·4	... 8·69

The report is printed.

The water supply from the East London Water Company has been satisfactory.

Scavenging is carried out by contract. The collection is weekly.

Stench arising from stagnant water in the old gravel pits at New Wanstead cause considerable annoyance during July and August.

Factory and Workshop Act. The necessary inspections have been made, but no contraventions of the act have been discovered.

There are two underground bakehouses, both structurally fitted for the purpose. The occupants have not yet applied for certificates.

*This is exclusive of the orphanage with a population of 895.

Isolation Hospital. The reconstruction of the hospital has been completed during the year. There are now 10 beds for Scarlet Fever and 8 for Diphtheria. 46 patients were admitted during the year, 10 from Wanstead and 36 from Woodford.

WITHAM.

Medical Officer of Health—KARL C. GIMSON, M.B., B.CH.

Population, 1901 census	...	...	3,454
„ 1903 estimated	...	...	3,498
Deaths registered in the district	...		38
Corrections	...	Additions	1
„	...	Deductions	0
			Mean for 12 years, 1881—1902.
Nett Death-rate	...	1903. 11.1	... 13.67
Zymotic Death-rate	...	—	... .86
Infantile Mortality	...	—	... 108.13
Birth-rate	...	20.9	... 23.04
Cases of Infectious Disease per			
1,000 population	...	1.1	... 5.87

The report is in manuscript.

The district has remained very free from infectious disease throughout the year. Four cases in all occurred, two being cases of Typhoid Fever. One of these was traced to a polluted well and one to shell fish.

Sewage disposal is satisfactory. The sewage farm has been visited from time to time and found to be in good condition.

The new supply of pure chalk water is being laid on to all parts of the district and the work is to be completed in May. The supply will then be continuous.

Factories and Workshops. There is no cause for complaint in any of these and the condition of the bakehouses and slaughterhouses is satisfactory.

The Isolation Hospital has not yet been commenced, but it is hoped that steps will be taken during the coming year to provide one for the district.

WOODFORD.

Medical Officer of Health—W. G. GROVES, M.R.C.S.

Population, 1901 census	...	...	13,798
„ 1903 estimated...	..	..	14,422
Deaths registered in the district	...		155
Corrections ..	Additions	...	5
„ ...	Deductions		3
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903. 10·9	... 12·04
Zymotic Death-rate	...	1·1	... 1·37
Infantile Mortality	...	108·0	... 125·4
Birth-rate	...	27·0	... 26·61
Cases of Infectious Disease per			
1,000 population	...	6·4	7·42

The report is printed.

Water Supply. This is now constant and is of the purest quality.

Sewage Disposal. There are two systems of drainage, an eastern and a western, the former being by far the more extensive. It is, at present, being altered and extended in the lower part of the district.

The sewage at the western works is treated by the bacteriological method. Works are now in progress to treat the sewage of the eastern portion of the district on the same system. In both instances after tank treatment the effluent flows over cultivated land.

Dust and refuse are collected weekly by a contractor.

Factory and Workshop Act. The total number of premises kept under observation under this Act is now 59. All are in good sanitary condition, any defects met with having been rectified.

One of the two underground bakehouses in the district has been closed, the proprietor preferring to build a new bakehouse above ground rather than carry out the extensive alterations required to enable a certificate to be granted for the old one.

Isolation Hospital. Entirely new provision in this respect will have to be made, as Wanstead, with which Woodford has had an agreement since 1894, has given a year's notice to end it. Two possible sites for a hospital have been inspected and a report on the subject will shortly be issued.

Small-pox cases are isolated at the Dagenham Hospital by arrangement with the West Ham Sanitary Authority.

The principal sanitary want in the district is the abolition of the stagnant ponds to which attention has been drawn in previous reports.

WALTON-ON-THE-NAZE.

Medical Officer of Health—J. W. COOK, M.D.

Population, 1901 census	...	...	2,015
„ 1903 estimated	...	...	2,061
Deaths registered in the district	...	...	23
Corrections	...	Additions ..	4
„	...	Deductions...	2
Mean for 12 years, 1891—1902.			
Nett Death-rate	...	1903 12·13	...
Zymotic Death-rate	...	·5	...
Infantile Mortality	...	55·55	...
Birth-rate	...	26·2	...
Cases of Infectious Disease per 1,000 population	...	2·4	...

The report is printed.

House accommodation for the working classes continues to be improved, new houses being built in various portions of the district and the old cottages yearly diminishing in number. The accommodation and the rent of the new houses would be more than are suited to working men's requirements were it not for the opportunity of letting to visitors in the season. The condition of the streets and roads is being much improved.

Sewage Disposal. The new system of sewers is working well and the septic tank, which exploded in 1902, has been repaired and is now adequately ventilated. Complaints have

been made of the odour from the septic tanks and colour of the sea close to the outfall and Dr. Cook suggests that the trouble may be remedied by carrying the outfall further out to sea. W.c.'s are in use throughout the district and are of modern type with good flushes. House refuse is removed by men employed by the Council weekly or oftener in the season.

The water supply is obtained from the deep wells of the Tendring Hundred Water Company. A new reservoir has been opened for the supply of Frinton and Walton-on-the-Naze, which affords an ample supply for all purposes, including fire prevention.

The one existing underground bakehouse cannot continue in occupation as the necessary certificate under the Factory and Workshops Act, 1901, has been refused, the premises being unsuitable.

Cases of infectious disease are perforce treated in their own homes, owing to the absence of an Isolation Hospital. Inquiries are made and disinfectants supplied in every case and in diphtheria cases antitoxin as well. Disinfection, after recovery, is by means of formalin by spray and fumigation. A difficulty has arisen as to the proposed provision of an Isolation Hospital, as the scheme for combination with neighbouring districts is unfavourably regarded by the adjoining Councils, and a scheme dealing only with a single small district such as this is considered to be wasteful.

WIVENHOE.

Medical Officer of Health—G. PENDER-SMITH, L.S.A.

Population, 1901 census	...	...	2,560
„ 1903 estimated	...	...	2,500
Deaths registered in the district	...	...	28
Corrections	...	Additions	2
,	...	Deductions	0

			1903,	Mean for 5 years, 1898—1902.
Nett Death-rate	...	...	10·0	13·1
Zymotic Death-rate	...	...	·4	1·34
Infantile Mortality	...	...	43·5	95·56
Birth-rate	...	...	18·4	24·1
Cases of Infectious Disease per				
1,000 population	...	...	15·2	6·32

The report is printed.

Both Scarlet Fever and Diphtheria were unusually prevalent, but caused no deaths. All the Diphtheria cases were treated with antitoxin and some of the contacts had prophylactic doses. Phthisis is notified, and the houses where it exists disinfected.

Bakehouses, dairies, slaughterhouses, factories, and workshops are inspected and have been found satisfactory.

Water Supply. Some of the houses are not yet connected with the mains, shallow wells being in use. It is recommended that immediate steps should be taken to close these.

Sewage Disposal. The scheme for a sewage system has again been discussed, but has been once more deferred owing to the financial position at the completion of the waterworks and the general want of prosperity of the district.

Isolation Hospital. There is no Isolation Hospital in or for the district. During the year one case of Typhoid Fever was removed to the Colchester Hospital.

III. RURAL DISTRICTS.

BELCHAMP

Medical Officer of Health—J. SINCLAIR HOLDEN, M.D.

Population, 1901 census	...	...	4,847
„ 1903 estimated	...	...	4,847
Deaths registered in the district	...	...	66
Corrections	...	Additions	4
„	...	Deductions	0
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903.	15·2
Zymotic Death-rate	...	·21	·75
Infantile Mortality	...	115·8	99·44
Birth-rate	...	19·6	20·77
Cases of Infectious Disease per			
1,000 population	...	1·24	7·31

The report is printed.

The geological formation of the district is chalk, covered on the higher ground with boulder clay and in the valleys with drift sand and gravel or brickearth; superficially with alluvium.

Water Supply. The deficiency of the supply in many of the wells of late years owing to the low rainfall has been quite put an end to by the unprecedented rainfall of this year, amounting to 31½ inches, about 50 per cent. above the average.

The contract for a public well for Borley has been successfully carried out. A four inch bore tube was sunk 126ft. The chalk was reached at a depth of 82 feet and the water stands at about that level.

In the village of Foxearth a new public supply has been generously given by Mr. Ward, by means of a standpipe on the roadside supplied from the artesian well reservoir at his brewery.

In the parish of Belchamp Otten, where a reservoir with filter and pump had been constructed last year in connection

with the school pond, it has been found necessary to remove the reservoir, and pump direct from the pond, as the water was much purer there than after it had stood in the reservoir. The pond is supplied by a spring.

Five wells have been cleaned out and in one case deepened. Two have been closed in consequence of contamination.

Sewage Disposal. No new sewers have been laid during the year, except that at Bures Hamlet a drain which is in part a sewer was made for six cottages. Nine ditches conveying sewage have been cleaned out. The Foxearth ditch has been fairly free from offence this year, owing both to the heavy rainfall and to the flushing it receives from the brewery.

Several new drains have been made and others repaired.

House Accommodation. Two new houses were erected and inspected, and seven demolished, three under closing orders and four voluntarily. One case of overcrowding was abated. Legal proceedings were taken in one case and a conviction obtained for failure to provide a drain for some cottages after repeated notices and warnings.

Factories and Workshops. There are no factories in the district. A register has been made of fifty-two workshops including fifteen bakehouses. All were inspected and any sanitary defects remedied. There are no employers of out-workers and no lists have been received of any resident out-workers.

No further steps have been taken with respect to the providing of an Isolation Hospital.

BILLERICAY.

Medical Officer of Health — F. CARTER, M.D.

Population, 1901 census	...	...	15,192
„ 1903 estimated	...	...	15,192
Deaths registered in the district	...	...	409
Corrections	...	Additions	0
„	...	Deductions	208

		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	... ..	13·2	15·33
Zymotic Death-rate	... ..	·4	1·30
Infantile Mortality	... ..	62·0	99·75
Birth-rate	... ..	25·5	27·0
Cases of Infectious Disease per			
1,000 population	... ..	2·9	6·92

The report is printed.

Sewerage and Drainage. The sewerage of the lower part of Billericay has been continued and a new sewer laid along the Back Lane and up the Norsey Road. The scheme in present contemplation is, however, incomplete and provision still requires to be made for dealing with the sewage from practically the whole of the Back Street of Billericay.

The dangerous pollution of a roadside pond at Hutton has been remedied by the construction of a sewer.

A Local Government Board enquiry has been held at Wickford into the proposed sewage works at that place. The School Authority object to the proposed site for the outfall works and the matter is at present under consideration by the Local Government Board.

A sewer is now being laid in Brook Street. It will serve the Warley Asylum, the Warley Peninsula, and Brook Street and will deliver at the outfall works at Puckwell Bridge, where three acres of land have been acquired for the purpose.

A sewer is being laid in Priests' Lane which will join the Hutton and Shenfield sewer.

Water Supply. The trial bore at Slyce's Gate has been carried to a depth of 787 feet, the chalk being reached at 499½ feet. Trial pumping will be commenced shortly.

Supervised Premises. Slaughterhouses, dairies, cowsheds, and bakehouses have been inspected, with a generally satisfactory result.

House Accommodation. Several houses have been reported on as dilapidated and orders given for repair. One house has been closed as unfit for human habitation.

Isolation Hospital. Thirty-two cases were admitted during the year, of which five came from Brentwood. A lodge has been built and is occupied by a former sanitary inspector and his wife, who has been a nurse.

BRAINTREE.

Medical Officer of Health—L. P. BLACK, M.A., M.B., D.P.H.

Population, 1901 census	...	...	18,106
„ 1902 estimated...	...	...	18,106
Deaths registered in the district	...	...	244
Corrections	...	Additions	0
„	...	Deductions...	12
Mean for 12 years,			
		1903.	1891—1902.
Nett Death-rate	...	12·8	15·02
Zymotic Death-rate	...	·44	·97
Infantile Mortality	...	82·6	97·7
Birth-rate	...	20·05	21·99
Cases of Infectious Disease per			
1,000 population	...	2·26	4·97

The report is printed.

Water Supply. The two new wells at Cressing have been completed. They will supply a considerable number of cottages previously without water.

A capital supply has been obtained from a new well at Cotton's Lane, Finchingfield, in place of the ponds and ditches previously in use.

A scheme for water supply and sewage disposal has been prepared for Coggeshall, but the cost appears prohibitive. £50 is to be spent in consideration of a similar scheme for Bocking.

Various old supplies have been protected or improved.

Sewage Disposal. New sewers have been laid at Coggeshall and Wethersfield and old sewers relaid at Terling and Rayne Road, Bocking. All the sewer ditches in the district have been cleaned out.

Dairies and Cowsheds. Twenty-six dairies and milkshops were inspected and 58 cowsheds.

Factories have been inspected in accordance with the Factory and Workshop Act, 1901.

Isolation Hospital. Ten cases have been removed to the Joint Hospital in Braintree and two cases of Small-pox were accommodated at Tiptree by the Lexden and Winstree Rural District Council. Sanction has been obtained from the Local Government Board after inquiry to purchase a site for a Small-pox hospital at Black Notley. The further arrangements are being made by the Joint Committee.

BUMPSTEAD.

Medical Officer of Health—W. ARMISTEAD, M.B.

Population, 1901 census	...	...	2,541
„ 1903 estimated	...	...	2,472
Deaths registered in the district	...	...	28
Corrections	...	Additions	5
„	...	Deductions	0
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903. 13·3	... 15·44
Zymotic Death-rate	...	1·6	... 1·32
Infantile Mortality	...	44·8	.. 111·6
Birth-rate	...	27·1	... 25·43
Cases of Infectious Disease per			
1,000 population	...	1·2	... 8·69

The report is printed and includes a special report on the Factories and Workshops.

The district is chiefly in the catchment basin of the Stour, with an elevation varying from 170 to 400 feet above sea level. The geological formation is chalk covered on the higher ground with boulder clay and in the valleys with gravel and alluvium.

House Accommodation. This is generally adequate owing to the decreasing population, but some of the old cottages are barely fit for habitation. No case of overcrowding has been

reported, nor has any house been represented as unfit for habitation. There is a sufficiency of open space about most of the cottages and cleanliness of surroundings is enforced as far as practicable. There are no building bye-laws in the district.

Sewerage and Drainage. The outfall of the sewer into the river at Steeple Bumpstead has been kept in a rather better condition than last year by again cleaning out the river in its course through the village. Birdbrook is the only other village in the district possessing a sewer, and this has been thoroughly flushed and cleaned out. Most of the houses are provided with sufficient garden ground for sewage disposal.

Excrement Disposal. Some of the houses have water-closets connected with cesspools, others have adopted the pail system, and the older type of privy is gradually being replaced by closets of improved construction.

House Refuse. No public scavengers are employed. Refuse is removed by the inhabitants, after notice by the Council where necessary, either to the adjacent garden or allotment ground.

Water Supply. This is derived from wells and ponds, which owing to the heavy rainfall during the year have, in contrast with recent experience, yielded a sufficient supply. The ponds at Jacob's Farm and White's Farm have had the weeds cut down during the early summer. Four samples of water from Helions Bumpstead were found on analysis to be polluted. A supply has been provided for Ashen by utilising springs in Church Field and on the Ridgewell Road.

There are no common lodginghouses in this district. The slaughterhouses, cowsheds, and dairies have been inspected as usual.

The seven bakehouses have been inspected and found satisfactory. There are now 35 workshops on the register, 27 having been added during the year. These have been inspected.

Home work is carried out chiefly in the parishes of Helions Bumpstead, Steeple Bumpstead, and Sturmer, but in

none of the houses have any cases of infectious disease been notified during the year, nor were any so unwholesome as to require the prohibition of homework.

Lists of outworkers have been furnished by employers, including one, totalling 117, obtained from a large clothing establishment.

Isolation Hospital. This is at present reserved for Small-pox, of which no case has occurred during the year.

CHELMSFORD.

Medical Officer of Health—JOHN C THRESH, M.D., D.SC.

Population, 1901 census	...	..	23,717
„ 1903 estimated	..	...	23,920
Deaths registered in the district	...		279
Corrections	...	Additions	45
„	...	Deductions	8
			Mean for 12 years, 1891—1902.
		1903.	
Nett Death-rate	...	13·2	14·43
Zymotic Death-rate	...	·71	1·13
Infantile Mortality	...	93·	91·77
Birth-rate	...	24·3	23·9
Cases of Infectious Disease per			
1,000 population	...	4·26	7·73

The report is printed.

House Accommodation. Forty-seven new houses have been erected and occupied during the year, but most of these are required for the increasing population. Many of the older cottages are ill-built and damp, and in most parishes none of better character are available. Owing to the want of cottages with three bedrooms a certain amount of overcrowding occurs and cannot be remedied.

A new and less stringent code of building bye-laws has been adopted which, it is hoped, will lead to the erection of an increased number of cottages.

Sewage Disposal. The sewage of Great Baddow, Springfield, and Widford is disposed of on a sewage farm along with that of the borough of Chelmsford. No complaint has been made of this farm. The Ingatestone effluent was found in March to be impure. Certain alterations were made and the nuisance has not recurred. Sewage works have been provided for Writtle and are working well. The sewage works at New Hall, Boreham, gave rise to complaints, but, the defects having been remedied, they are now working well.

Excrement Disposal. The pail closets in the more populous portions of Writtle, Broomfield, and Little and Great Waltham are scavenged by a contractor for a fixed annual sum.

House Refuse. In the more rural parishes the inhabitants dispose of this in their gardens, usually in a "bumby." These cause no nuisance if not too close to the cottages and if the contents are occasionally covered with earth. Springfield and Great Baddow are scavenged weekly by a contractor for a fixed annual sum. A penalty is provided for neglect, and the system works well so long as supervised by the Inspector.

Water Supply. The works for Springfield and Great Baddow yield an abundant supply in the driest season. There is, however, some difficulty in maintaining the increased pressure now required owing to the erection of new houses on higher ground and to furring of the mains. Three alternative schemes proposed by the Surveyor for increasing both the supply and the pressure are under consideration.

The Danbury waterworks have yielded an abundant supply, owing to the heavy rainfall. The project of providing an additional higher level reservoir has been abandoned, at least for the present.

The new works at Ingatestone are now to be completed by increasing the depth of the well to about 300 feet in order to provide storage for accumulation of water in the intervals of pumping. The total cost is estimated at £8,626.

The bore at Writtle has been completed, but the trial pumping was rendered useless by the enormous amount of sand raised. The need of a public supply is urgent, but it seems likely to be some years before it can be obtained.

Most of the shallow wells in the district are defective and polluted, and many superficial springs are also seriously liable to pollution. Two old wells have been re-constructed and several new ones dug as suggested in the circular of instructions drawn up for the purpose.

There is no common lodginghouse in the district.

Cowsheds, milkshops, slaughterhouses, and offensive trades are regularly inspected. One cowshed was reported as unfit for use and is to be abandoned.

Factories and Workshops Act. The workshops and workplaces are inspected at least once a year, and the bakehouses more frequently. Some difficulty is experienced in securing the cleanliness of the latter and preventing their use as lumber-rooms. A register of factories and workshops is kept.

Disinfection is carried out by means of two per cent. formalin spray and subsequent sulphur fumigation, one pound of sulphur per 1,000 cubic feet being used.

Isolation Hospital. Little progress has been made by the Joint Hospital Board towards providing the district with a suitable hospital. The amount of accommodation required is under discussion.

DUNMOW.

Medical Officer of Health—E. E. GOODBODY, M.D.

Population, 1901 census	...	...	15,705
„ 1903 estimated	...	...	15,520
Deaths registered in the district	...	...	233
Corrections	...	Additions	0
„	...	Deductions	0

			1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	...	...	15·0	15·89
Zymotic Death-rate	..	...	·45	·92
Infantile Mortality	..	...	76·3	87·08
Birth-rate	...	...	23·6	23·15
Cases of Infectious Disease per				
1,000 population	...	...	1·2	5·38

The report is printed.

Sewage Disposal. By the present system the sewage is run directly into the Chelmer. The Council has discussed the matter and collected information, but so far no definite plan of reform has been settled on. The Medical Officer of Health considers that the question of a public water supply is more important and should precede that of sewage disposal.

In the smaller villages the disposal of sewage by running it into streams and ditches is universal and no system for the removal of house refuse is anywhere in force.

Several new sewers have been laid and defective sewers repaired. All open sewers have been cleaned out and the inlets to the road drains cleaned and trapped where necessary. The drains of a number of cottages have been inspected and in 33 cases repaired.

Water Supply. The scheme for a pure water supply in the village of Felstead has been adopted by the Council and the Local Government Board has been requested to hold an inquiry.

Supervised Premises. The condition of the common lodging-house at Church End, Great Dunmow, continues good. All factories and workshops have been inspected and found satisfactory. Registers and lists of outworkers are duly kept.

Isolation Hospital. Progress in providing a hospital has been delayed by the necessity of demonstrating the possibility of obtaining water. A bored well has been sunk into the chalk and water struck at a depth of $284\frac{1}{2}$ feet. The plans have now

been prepared and now await the approval of the Local Government Board. It is hoped that construction will shortly be commenced.

EPPING.

Medical Officer of Health—TREVOR FOWLER, L.R.C.P.

AND S.I., D.P.H.

Population, 1901 census	...	...	12,782
„ 1903 estimated...	...	...	12,782
Deaths registered in the district	...	...	133
Corrections	...	Additions	9
„	...	Deductions...	1
		Mean for 12 years, 1891—1902.	
Nett Death-rate	...	1903. 11·0	... 13·77
Zymotic Death-rate	...	·94	... 1·31
Infantile Mortality	...	100·3	... 100·65
Birth-rate	...	24·2	... 24·4
Cases of Infectious Disease per			
1,000 population	...	2·97	... 5·87

The report is printed.

Water Supply. This is mainly provided by the Herts and Essex Water Company, while the East London Company supplies the Chigwell end of the district. The supplies of both companies are intermittent and cisterns should therefore be provided in all the houses supplied. The excessive hardness and the frequent presence of a considerable amount of iron in the Herts and Essex Company's water are objectionable. Their mains have been extended from Harlow to the Sheering Road and Mill Street.

All public wells and pumps have been kept in good repair and several new wells have been sunk.

Sewerage and Drainage. New sewers have been laid at Harlow, Blackacre Road, Coppice Row, and Piercing Hill. The old sewers at Harlow and Coppice Row have been left for

storm and surface drainage. A public sewer is required for the northern end of Theydon Bois.

Factory and Workshop Act. All premises coming under the Act have been inspected during the year. The sanitary conditions were in all cases satisfactory. No homeworkers are employed in the district.

HALSTEAD, No. 1.

Medical Officer of Health—J. H. ASHWORTH, M.D.

Population, 1901 census	...	...	4,481
„ 1903 estimated	...	...	4,561
Deaths registered in the district	...		51
Corrections	...	Additions	6
„	...	Deductions	0
		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	...	12·5	14·51
Zymotic Death-rate	...	·66	·63
Infantile Mortality	...	107·6	97·75
Birth-rate	...	22·36	24·41
Cases of Infectious Disease per			
1,000 population	...	8·6	5·87

The report is printed.

Sewage Disposal. The drainage scheme for Earls Colne is in abeyance. Systematic scavenging is also required, the village having a population of about 1,800.

Water Supply. The village of Earls Colne is inadequately supplied with pure water. A new public pump has been erected at Greenstead Green.

Supervised Premises. The bakehouses and slaughterhouses have all been inspected and found in proper order.

Factories and Workshops Act. A register of workshops and workplaces has been provided. They have all been inspected and are in a satisfactory condition.

HALSTEAD, No. 2.

Medical Officer of Health—J. B. BROMLEY, M.R.C.S.

Population, 1901 census	...	...	5,695
„ 1903 estimated	...	...	5,695
Deaths registered in the district	...	...	56
Corrections	...	Additions	8
„	...	Deductions	0
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903. 11·2	...
Zymotic Death-rate	...	·0	...
Infantile Mortality	...	35·0	...
Birth-rate	...	25·1	...
Cases of Infectious Disease per 1,000 population	...	3·51	...

The report is printed.

Housing. One cottage at Sible Hedingham was condemned as unfit for habitation, but still remains occupied. A case of overcrowding at Great Yeldham has been abated.

Water Supply. Five wells in Castle Hedingham, two in Sible Hedingham, and one in Toppesfield have been deepened, and a better supply of water obtained.

Sewage Disposal. At Sible Hedingham a new sewer, with bacterial and filter tank, has been constructed in Church Street. The greater number of owners have connected their slop drains to the sewer and converted privies into w.c.'s.

Some improvements have been made and more are required in the sanitary arrangements of Hedingham and Yeldham railway stations.

Supervised Premises. All bakehouses, slaughterhouses, dairies, and cowsheds have been inspected and found in satisfactory condition.

All factories, workshops, and work-places have also been inspected and certain improvements effected.

Isolation Hospital. Sixteen cases, all of Scarlet Fever, have been treated during the year. Of these all but one were from

the Halstead Urban and first division of the Rural District. New iron fencing has been erected and some necessary alterations and repairs are being carried out.

LEXDEN AND WINSTREE.

Medical Officer of Health—J. W. COOK, M.D.

Population, 1901 census	...	18,572
„ 1903 estimated...	...	18,960
Deaths registered in the district	...	234
Corrections	...	Additions ... 0
„	...	Deductions... 1
		Mean for 12 years, 1891—1902.
Nett Death-rate	1903. 12·3	... 14·27
Zymotic Death-rate	... 6*	... 1·25
Infantile Mortality	... 86·9	... 91·37
Birth-rate	... 23·7	... 24·63
Cases of Infectious Disease per		
1,000 population	... 2·7	... 6·55

* Deaths registered in the district, uncorrected.

The report is printed.

The district, with the exception of the village of Row-hedge, is purely an agricultural one. The soil is mainly clay, with beds of gravel and sand in places.

House Accommodation. Many of the workmen's cottages are very old and with poor accommodation. A code of building bye-laws came into operation in the early part of the year. It has been found desirable to seek for some modification in these and the Local Government Board is at present considering the application. Some new cottages have been built of wood and more comfort obtained at a less expense than when brick is used.

Sewerage and Drainage. No addition has been made to the drainage of the district during the year. Several villages require sewers.

Excrement Disposal. Pail closets have to some extent taken the place of the old common privy, but are not always properly attended to. The pails, cesspools, and privies at West Mersea and Rowhedge are emptied by a contractor, and at Dedham a contractor empties the catchpits on the line of sewer, elsewhere the occupier being responsible. Portable iron ashbins are being introduced as far as possible.

Water Supply. The new supply at Rowhedge has been completed by mains being laid all over the village and many houses are already connected.

A new pump is much needed on the Fingringhoe spring.

A new supply is much needed at Abberton, but nothing has as yet been done towards providing it. The construction of a well and pump is recommended.

The Stanway standpipe supply derived from the Borough of Colchester, though very costly, has answered well and is appreciated. The lease is running out, but its extension may not be required as a new well, 315 feet deep and tapping a plentiful supply in the chalk, has been sunk in the neighbourhood.

Supervised Premises. The 15 slaughterhouses have been frequently inspected and found to be carefully attended to. The inspection of dairies, cowsheds, and milkshops has been only partially carried out. The bakehouses are generally in good order, but one was found to contain a sink and copper used for the family washing.

Factory and Workshop Act. All known workshops are looked after. The list of outworkers contains 851 names. The houses of these persons are generally clean and orderly and the people themselves obedient to any necessary instructions.

Isolation Hospital. There is no proper Isolation Hospital. The tent hospital for Small-pox cases has been most useful. Two outbreaks of Small-pox were successfully coped with by its aid and that of a portable steam disinfecter.

MALDON.

Medical Officer of Health—JOHN C. THRESH, M.D., D.Sc.

Population, 1901 census	...	...	14,630
„ 1903 estimated...	...	...	14,630
Deaths registered in the district	...	...	154
Corrections	...	Additions	28
„	...	Deductions...	0
			Mean for 5 years, 1898—1902.
Nett Death-rate	...	1903.	12·4
Zymotic Death-rate	...	...	·55
Infantile Mortality	...	...	69·6
Birth-rate	...	...	24·5
Cases of Infectious Disease per			
1,000 population	...	4·1	6·18

The report is printed and contains an introduction addressed to the inhabitants and an appendix describing the Maldon Joint Hospital.

House Accommodation. The general condition is slowly improving and further improvement is looked for as the result of the new bye-laws, which have practically been approved by the Local Government Board and which enforce the paving of yards and sanction the erection of less expensive cottages than the present code permits. The Local Government Board inquiry into the scheme for the provision under the Housing of Working Classes Act of six cottages at Bradwell resulted in the sanction of a loan for £1,250. It seems probable from the tenders received that even this large sum will not suffice. One house has been closed as unfit for human habitation. The recently adopted bye-laws for tents, vans, and sheds have been infringed in almost every case. Legal proceedings are in contemplation. Overcrowding has occurred mainly from the importation of holiday children in summer, being otherwise not excessive.

Sewage Disposal. The irrigation areas at Tillingham and Tolleshunt D'Arcy and the bacterial installation at Tollesbury

have acted satisfactorily. Nuisance is said to have occurred at the Heybridge Basin outfall. It has been suggested that this would be overcome by continuing the outfall further into the creek, but nothing has yet been decided upon.

At Southminster one of the outfalls has been extended, but further improvement is needed.

Nuisances arise at various places from the discharge of sewage into ditches. More attention to these ditches, which are practically public sewers, is recommended.

Excrement Disposal. A scavenger has been appointed to remove the contents of the pail closets at Heybridge Basin. Tollesbury and Southminster are satisfactorily scavenged, but no scavenger has been appointed for Heybridge. At Althorne ground has been provided for the disposal of the slops of certain cottages in the street by the acquisition of a small area of land at their rear. The privies have been set back also.

House Refuse. The bye-laws with reference to refuse removal apply to all parts except Tollesbury, but are not rigorously enforced.

Water Supplies. The heavy rainfall has caused the small subsoil supplies to yield abundantly.

The public supplies to Purleigh and other parishes and to Southminster continue very satisfactory.

The waters yielded by the seven public wells in Tillingham were examined in May. Five were found to be polluted with manure or sewage. Notices were ordered to be fixed to the five pumps declaring the water unfit for drinking.

At Steeple one of the deep wells has been repaired and deepened. The other requires attention.

A loan of £120 for improving the Goldhanger well has been sanctioned and orders given for the work to be commenced.

A loan of £1,950 has been sanctioned for carrying out the Tolleshunt Knights scheme. The supply is from a gravel patch near Tiptree Heath and will yield more than is required.

Negotiations are still proceeding for supplying the village of Heybridge from the mains belonging to the Ironworks.

At Heybridge Basin the level of the water in the deep well continues to fall and a notice has been posted restricting the use of the water to domestic purposes. Negotiations are in progress for the acquisition of another deep well in the hamlet, which is at present useless.

Supervised Premises. There are no offensive trades in the district and no common lodginghouse. The construction of the slaughterhouses is rarely satisfactory but they are kept fairly clean. The bakehouses are now kept in better order than before as the result of a circular pointing out the requirements of the Factories and Workshops Act. The bye-laws for dairies and cowsheds are enforced as far as possible. Workshops and workplaces are regularly inspected.

Isolation Hospital. The hospital provided by the Maldon Joint Hospital Board was opened in December. It consists of three blocks on a site of three acres and can accommodate ten patients suffering from two diseases. Water is obtained from a boring in the Thanet sands and pumped by a Robinson hot air engine to storage tanks. The sewage is pumped on to an irrigation plot. A disinfecter is provided. The total inclusive cost was £5,000 and the result is a most complete little hospital. The site for a Small-pox hospital at Little Totham has been fenced in and a wood and iron building erected. It can be prepared for the reception of a patient in a few hours.

ONGAR.

Medical Officer of Health—J. C. QUENNEL, M.R.C.S.

Population, 1901 census	...	...	10,044
„ 1903 estimated...	...	...	10,044
Deaths registered in the district	...	...	130
Corrections	...	Additions	0
„	...	Deductions	0

		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	... ..	13·4	15·01
Zymotic Death-rate	... ..	1·1	1·04
Infantile Mortality	.. ..	122·4	112·23
Birth-rate	... ..	24·4	24·51
Cases of Infectious Disease per			
1,000 population	... ..	3·8	6·11

The report is printed.

The district is a purely agricultural one.

Water Supply. This is satisfactory both in amount and in purity.

As the result of a visit by a Local Government Board Inspector the necessary amount has been granted for the expense of laying on water mains from the Essex and Herts Water Company's supply to the parish of Bobbingworth and this work will shortly be accomplished.

Sewage Disposal. The works at Chipping Ongar appear to be satisfactory, but many houses are not yet connected. The new system at Abridge is working satisfactorily.

The eastern part of High Ongar is still undrained and the sewage, finding its way into the roadside ditches, creates a dangerous nuisance.

A drainage system is required for Fyfield, not only for the safety of the inhabitants, but to diminish the pollution of the river Roding, into which the crude sewage still finds its way.

House Accommodation. This difficult question remains unsolved. Landlords of dilapidated cottages will not incur the expense of repairs and the hardship to the tenants involved by closing the houses prevents the sanitary authority from exercising its powers of doing so.

Factory and Workshop Act. No register has been prepared nor is any information available.

Isolation Hospital. It is proposed to erect a cottage with accommodation for four patients. Recent experience indicates that this may be sufficient.

ORSETT.

Medical Officer of Health—REA CORBETT, M.R.C.S.

Population, 1901 census	...	..	19,912
„ 1903 estimated	...	...	21,062
Deaths registered in the district	...	...	291
Corrections	...	Additions	5
„	...	Deductions	26
		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate	...	12·8	15·2
Zymotic Death-rate	...	1·3	2·48
Infantile Mortality	...	122·7	130·84
Birth-rate	...	33·3	32·18
Cases of Infectious Disease per			
1,000 population	...	6·5	11·2

The report is printed.

The geological formation underlying the district is chalk, which crops out at Grays and Stifford. Thanet sands, Woolwich beds, London clay and Bagshot beds occur in different parts.

Water Supply. The chief supply is derived from the South Essex Water Company. The mains supply Tilbury Docks, Little Thurrock, West Thurrock, Stifford, Aveley, South and North Ockendon, Stanford-le-Hope, and Horndon-on-the-Hill. The wells are situated at Grays, Linford, and Mucking. A supply to Horndon-on-the-Hill is now laid on from Linford, where a second large well has been sunk into the chalk and an abundant supply of good water obtained. A new main has been laid from it to the Aveley reservoir. There is a scarcity of water at Orsett, although many wells have been deepened, but negotiations with the South Essex Company have resulted in mains being laid to the village.

Bulphan and the lower parts of North and South Ockendon are supplied from artesian wells.

A main has been laid from Stanford-le-Hope to Digby Road, Corringham. An agreement has been made with the

Southend Water Company to lay a main and supply the village of Fobbing.

Laindon Hills is badly supplied, the spring at Well Green being liable to pollution. A spring on the West Hill has been enclosed and covered and yields a good supply.

To the north of Laindon Hills, where a considerable amount of building is going on, water certificates have been refused for houses where the supply proposed was rain water caught on the roofs.

Sewage Disposal. A sewer is laid from Tilbury Station to join the Grays system, draining the houses and buildings at Tilbury Docks and parts of Chadwell St. Mary and Little Thurrock. At Stanford-le-Hope and Corringham sewers and bacteria beds are now in use. In no other parish is there a proper sewerage system. At Orsett the union house and 50 to 60 cottages drain into a subsidence tank, from which the overflow runs into a ditch about 300 yards distant.

Public scavenging is in force at West Thurrock, Little Thurrock, Stifford, Tilbury Docks, and Stanford-le-Hope. Cesspools are emptied by tank vans at South Ockendon, Stifford, West Thurrock, and Purfleet.

House Accommodation. Of late years many cottages have been condemned and closed and many more put into a good state of repair. Overcrowding does not prevail to any great extent.

The industries carried on largely in the district are oil refineries, paper, explosives, and cement making.

Bakehouses and slaughterhouses, cowsheds, dairies, and milkshops have been regularly inspected and found generally in good order.

The chief sanitary requirements are, drainage of West Thurrock and Aveley and water supply to Orsett, Corringham, and Fobbing.

ROCHFORD.

Medical Officer of Health—F. DORRELL GRAYSON, M.R.C.S.

Population, 1901 census	...	...	14,565
„ 1903 estimated...	...	...	15,444
Deaths registered in the district	...	...	214
Corrections	...	Additions	0
„	...	Deductions...	26
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903.	...
Zymotic Death-rate	...	1·1*	...
Infantile Mortality	...	77·3	...
Birth-rate	...	26·8	...
Cases of Infectious Disease per			
1,000 population	...	7·4	...

* Deaths registered in the district, uncorrected.

The report is printed.

Water Supply. The Western District water scheme has been completed and commenced to supply water early in August, chiefly to houses in South Benfleet and Rochford, the houses *en route* being not yet connected with the main in large numbers. The water is soft and excellent for all purposes.

Drainage. The drainage schemes for Hadleigh, Rayleigh, and Benfleet have been further considered, but nothing definite has been decided upon.

Brickfields. No complaints have been made.

Gipsies. A considerable colony of gipsies is growing up on the Bohemian Estate, Eastwood, where some of the race have purchased plots of land which they let as camping ground to their friends. Two cases of Typhoid Fever have occurred amongst them and more stringent bye-laws are required.

ROMFORD.

Medical Officer of Health—A. WRIGHT, M.D.

Population, 1901 census	...	...	19,018
„ 1903 estimated...	...	...	20,000
Deaths registered in the district	...	...	248
Corrections	...	Additions	22
„	...	Deductions	6
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903.	14.21
Zymotic Death-rate	...	1.65	2.24
Infantile Mortality	...	109.1	132.03
Birth-rate	...	31.1	29.82
Cases of Infectious Disease per 1,000 population	...	16.0	9.50 (11 years.)

The report is printed.

Water Supply. The South Essex Water Company supplies the greater part of the district.

Sewage Disposal. The plans of systems of sewerage for Rainham and for Dagenham, which are much needed, still await the sanction of the Local Government Board. When these are carried out all parts of the district, with the exception of isolated localities, will be well sewered.

The slaughterhouses, bakehouses, dairies, and cowsheds have been inspected. One or two were repaired, &c., under notice from the Sanitary Inspector.

House Accommodation. Three houses have been closed as unfit for human habitation, seven cases of overcrowding abated, seventeen filthy houses cleansed, and twenty-two dilapidated houses repaired.

Nuisance. A very offensive factory at Rainham for the manufacture of fish oil from decomposing fish, which last year caused serious pollution of the stream and much nuisance, has been closed. A foul state of the atmosphere is frequent here, due to factories (manures, candles, glue, &c.) on both banks of the Thames, especially the southern.

SAFFRON WALDEN.

Medical Officer of Health—WM. ARMISTEAD, M.B., F.C.S.

Population, 1901 census	...	...	10,764
„ 1903 estimated	...	...	10,425
Deaths registered in the district	...	...	130
Corrections	...	Additions	27
„	...	Deductions	0
			Mean for 12 years, 1891—1902.
Nett Death-rate	...	1903. 15·1	... 15·78
Zymotic Death-rate	...	·2	... 1·11
Infantile Mortality	...	69·9	... 97·5
Birth-rate	...	22·0	... 24·73
Cases of Infectious Disease per			
1,000 population	...	4·0	... 5·45

The report is printed and includes a special report on the Factories and Workshops Act.

The district varies in elevation from 120 to 450 feet. The geological formation is chalk, covered on the higher ground with boulder clay and in the valleys with gravel and alluvium.

House Accommodation. Generally sufficient in view of the decreasing population. Some of the older cottages are barely fit for human habitation, but during the year no house was officially represented as being unfit. Of the total houses only about three per cent. have less than three and 11 per cent. less than four rooms.

There are no building bye-laws in force in the district.

Sewerage and Drainage. At Newport the sewers have their outfall into the river and often cause unpleasant smells. The sewer for the villages of Rickling and Quendon has been systematically flushed out during the year.

Excrement Disposal. Some of the houses have water closets connected with cesspools. The older type of privy is gradually being replaced by pail closets or privies of improved construction.

House Refuse. In all parts of the district the occupiers are responsible for the removal of their house refuse, which is disposed of on the gardens adjacent to the houses or on the allotments.

Water Supply. This is chiefly from the chalk, and at the beginning of the year, owing to the succession of six dry seasons, the public wells at Arkesden, Clavering, and Ashdon failed. The well at Clavering was deepened 6 feet and that at Ashdon $7\frac{1}{2}$. Since the heavy rainfall of last year the water level in the chalk has risen above the point at which it stood in February, 1900, and the wells in the district now yield a plentiful supply. A well at Wicken has been taken over and put in repair by the District Council.

Supervised Premises. There are no common lodginghouses. Slaughterhouses, dairies, cowsheds, and milkshops have been inspected and found satisfactory except in the case of two dairies where the sinks discharged inside over untrapped drains. This is now being remedied.

Factories and Workshops Act. There are 36 bakehouses which have been inspected and found satisfactory. There are now 68 workshops on the register. These have been inspected and certain matters relating to their sanitary condition have been attended to. Some homework is given out in the parishes of Ashdon and Hempstead from a factory outside the district.

Isolation Hospital. This is the joint property of the Saffron Walden Urban and Rural Districts and is under the management of a Joint Hospital Board. During the year 17 cases, all of Scarlet Fever, were removed to it from this district.

STANSTED.

Medical Officer of Health—R. A. DUNN, M.D., D.H.Y.

Population, 1901 census	...	...	6,888
„ 1903 estimated	...	...	6,888
Deaths registered in the district	...		76
Corrections	...	Additions	14
„	...	Deductions	0

		1903.	Mean for 12 years, 1891—1902.
Nett Death-rate ...	...	13·07	13·02
Zymotic Death-rate ...	...	·29	·94
Infantile Mortality ...	...	77·4	103·1
Birth-rate ...	...	24·39	22·83
Cases of Infectious Disease per 1,000 population ...	...	5·37	5·46

The report is printed.

Water Supply. A new well has been sunk at Henham during the year. The yield, though at present sufficient, unfortunately did not come up to expectation. Owing to the heavy rainfall there is no shortage of water now in the district.

Sewage Disposal. The high level sewer at Stansted has been extended and the lower parts of the town have been drained during the year by the Liernur system. This has proved satisfactory, though a few of the cottage traps gave trouble at first, owing to the occupiers allowing obstructive matters to be thrown down the drains. Now that most of the houses have been connected with the sewer the existing cess-pools are being done away with.

Premises under Supervision. The cowsheds have all been inspected and the register brought up-to-date. Slaughterhouses and bakehouses are periodically visited and on the whole are fairly satisfactory.

Factory and Workshop Act. The Sanitary Inspector has completed the register. The premises have been found to be in a satisfactory state, any necessary improvements being readily carried out.

Isolation Hospital. The Small-pox hospital, situated in the Hadham Rural District of Hertfordshire, is the joint property of the Stansted and Hadham Rural and Sawbridgeworth and Bishop Stortford Urban District Councils. That for other infectious diseases is situated in the Urban District of Bishops Stortford. It accommodates patients from all the above districts and is managed by a Joint Committee.

TENDRING.

Medical Officer of Health—J. W. COOK, M.D.

Population, 1901 census	...	...	20,507
„ 1903 estimated...	...	...	20,983
Deaths registered in the district	...	...	269
Corrections	...	Additions	0
„	...	Deductions...	30
			Mean for 13 years, 1890—1902.
Nett Death-rate	...	1903.	11·4
Zymotic Death-rate	...	...	·7*
Infantile Mortality	..	...	61·2
Birth-rate	..	...	24·9
Cases of Infectious Disease per			
1,000 population	...	3·6	4·21

* Deaths registered in the district, uncorrected.

The report is type-written.

The building bye-laws are enforced under the supervision of the inspector. The relaxation which was in contemplation last year has on further consideration not been deemed necessary.

Seventeen houses have been represented as unfit for human habitation and notices for repair issued. In some cases the repairs have been completed and in others they are in progress. Twenty-one new cottages have been built.

Investigation into the condition of dairies and cowsheds has been continued and pressure has been gradually substituted for persuasion, with the result that some very good new cowsheds have been erected and others modernised. Much, however, still remains to be done.

The water carriage system of sewage disposal is in use in the more populous parts of the district, but several of these localities are not properly sewered and many hand flushed w.c.'s remain. At Manningtree, Mistley, and Parkeston, house refuse is removed by contract and the plan answers well. Its extension to the adjoining portion of Lawford is advocated.

The Tendring Hundred Water Company's supply is now laid on to Little Clacton, but the difficulty as to supplying the village of Ardleigh remains, the length of main required being four miles.

Six schools have been closed during the year on account of infectious disease.

The voluntary notification of phthisis has been adopted.

The Isolation Hospital consists of a van and three tents (eight beds). It has not been in use during the year.

POPULATIONS, 1901 & 1903, & NO. OF BIRTHS.

NAMES OF LOCALITY.	Population, Census 1901.	Population, middle of 1900. (estimated)	No. of Births.	No. of Deaths Net.	MORTALITY FROM ALL CAUSES SUBJOINED AGES.						NAMES OF LOCALITY.	Population, Census 1901.	Population, middle of 1900. (estimated)	No. of Births.	No. of Deaths Net.	MORTALITY FROM ALL CAUSES AT SUBJOINED AGES.					
					Under 1.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.						Under 1.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.
URBAN.										RURAL.											
BARKING	21,547	25,000	856	357	97	72	29	16	96	47	BELCHAMP	4,847	4,847	95	70	11	1	4	...	22	32
BRAINTREE	5,330	5,330	118	68	9	5	...	6	16	23	BILLERICAY	17,504	17,503	387	201	26	12	4	14	52	93
BRENTWOOD	4,932	5,637	106	54	9	5	2	1	17	20	BRAINTREE	18,109	18,106	363	232	30	7	7	12	48	128
BRIGHTLINGSEA	4,501	4,640	112	62	12	10	2	2	14	22	BUMPSTEAD	2,541	2,472	67	33	3	3	2	1	7	17
BUCKHURST HILL	4,786	5,000	113	44	10	9	1	...	14	10	CHELMSFORD	23,717	23,920	581	316	54	12	16	13	86	135
BURNHAM	2,919	3,200	89	37	6	3	4	1	6	17	DUNMOW	15,705	15,520	367	233	28	9	10	8	78	100
CHELMSFORD	12,580	13,000	327	156	32	11	3	9	44	57	EPPING	12,783	12,782	309	141	31	8	9	2	30	61
CHINGFORD	4,373	5,003	115	46	10	2	...	2	19	13	HALSTEAD I.	4,481	4,561	102	57	11	2	3	1	16	24
CLACTON	7,456	7,649	162	163	16	9	3	6	38	33	HALSTEAD II.	5,695	5,695	143	64	6	2	2	4	14	36
COLCHESTER	38,373	39,300	1,021	499	128	35	20	20	147	149	LEXDEN AND WINSTREE	18,586	18,960	449	233	39	11	9	9	60	106
EAST HAM	96,018	110,451	3,805	1,265	430	208	51	52	347	177	MALDON	14,633	14,630	359	182	25	6	2	11	51	87
EPPING	3,789	3,918	75	35	9	4	...	1	13	8	ONGAR	10,044	10,044	245	135	31	13	1	11	27	52
FRINTON	645	800	18	4	3	...	...	...	1	...	ORSETT	19,912	21,062	701	270	86	18	13	11	59	83
GRAYS	13,834	14,750	504	161	48	12	16	11	43	33	ROCHFORD	14,565	15,444	414	188	32	12	9	10	91	60
HALSTEAD	6,073	6,100	145	114	21	12	5	6	27	57	ROMFORD	19,018	20,000	623	264	60	23	15	16	69	81
HARWICH	10,070	10,353	315	98	27	9	3	8	27	19	SAFFRON WALDEN	10,764	10,425	229	157	16	3	5	5	29	99
ILFORD	41,234	54,226	1,522	498	141	59	16	19	129	108	STANSTED	6,888	6,888	168	90	13	7	5	2	15	48
LEIGH-ON-SEA	3,667	4,064	111	40	7	3	...	2	14	14	TENDRING	20,984	20,983	523	239	32	19	24	10	65	119
LETON	98,912	102,000	273	1,112	322	159	49	30	318	234											
LOUGHTON	4,730	5,000	123	42	11	6	...	3	11	11											
MALDON	5,565	5,599	157	74	12	3	1	2	19	37											
ROMFORD	13,656	14,400	424	168	42	18	5	9	61	106											
SAFFRON WALDEN	5,896	5,854	108	72	8	1	4	...	21	38											
SHOEBURYNESS	4,081	4,275	173	44	16	3	...	4	12	9											
SOUTHEND-ON-SEA	28,857	37,283	935	443	112	32	18	14	168	99											
WALTHAM HOLY CROSS	6,549	6,653	189	73	18	3	2	1	32	17											
WALTHAMSTOW	95,131	106,290	3,535	1,178	401	186	45	41	258	207											
WALTON-ON-NAZE	2,014	2,061	54	25	3	1	2	2	11	4											
WANSTEAD	8,284	8,818	167	99	17	8	4	5	32	36											
WITHAM	3,454	3,498	73	39	4	1	1	...	16	16											
WIVENHOE	2,560	2,500	46	25	2	3	3	1	8	8											
WOODFORD	13,798	14,422	386	157	42	21	7	6	45	36											

NATIONAL TELEPHONE:
BOLCKOW'S, SOUTH BANK."



24 FEB 1904

MEADOWCROFT,

ESTON, R.S.O.,

YORKSHIRE,

RGE C. H. FULTON, M.B. C.M.

MEDICAL OFFICER
OF HEALTH.

With compliments.
