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ESSEX COUNTY COUNCIL.

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SUMMARY of NOTIFICATION RETURNS

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Cases Notified during the Month ending

July 31st, 1899.

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Diphtheria is still prevalent in the Dunmow Rural District. Scarlet Fever shows epidemic prevalence in the Borough of Chelmsford.

In the West Ham Union Workhouse in Leyton Urban District several cases of Infectious Disease have occurred which are not included in the County returns.

JOHN C. THRESH,

County Medical Officer of Health.

Aug. 5th, 1899.

Compulsory Notification is in force in all the Districts in the County. The prevalence of certain diseases not notifiable is indicated as follows :--A FEW CASES, X ; PREVALENT, XX ; VERY PREVALENT, XXX.

[illegible]



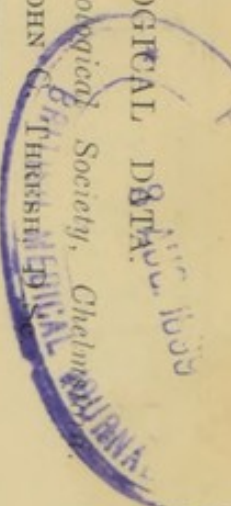
RURAL.	Popula- tion. CENSUS 1891.	FEVERS.										DISEASES PREVALENT				Medical Officer of Health.
		Smallpox.	Cholera.	Diphtheria.	Croup.	Erysipelas.	Scarlet Fever.	Typhus.				Measles.	Whooping Cough.	Mumps.	Influenza.	
								Enteric.	Relapsing.	Continued.	Puerperal.					
Belchamp	5,722	...	...	...	...	1	...	...	...	...	...	...	...	...	...	J. S. Holden, M.D.
Billericay	15,624	...	...	1	...	2	12	...	1	...	...	...	...	...	...	F. Carter, M.D
Braintree	19,976	...	...	1	...	...	3	...	...	...	...	...	...	...	...	T. Carr, M.D., D.P.H.
Bumpstead	3,064	...	...	...	...	...	6	...	...	...	...	...	...	...	...	W. Armistead, M.B.
Chelmsford	23,174	...	...	...	...	...	8	...	...	...	...	XX	...	...	...	J. C. Thresh, M.D., D.Sc., D.P.H.
Dunmow	16,674	...	...	17	...	...	3	...	...	...	...	...	...	...	...	E. E. Goodbody, M.D.
Epping	19,270	...	...	1	...	...	5	...	1	...	...	...	X	...	...	T. Fowler, L.R.C.P.I., L.R.C.S.I., DPH
Halstead, No. 1	4,762	...	...	1	...	...	...	...	...	...	...	...	...	...	...	J. H. Ashworth, M.D.
" No. 2	6,048	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J. B. Bromley, M.R.C.S.
Lexden & Winstree	21,566	...	...	1	...	2	1	...	...	...	...	...	...	...	...	J. W. Cook, M.D.
Maldon	18,034	...	...	...	...	...	1	...	...	...	...	...	...	...	...	J. C. Thresh, M.D., D.Sc. D.P.H.
Ongar	10,557	...	...	2	...	1	1	...	...	...	...	...	X	...	...	J. C. Quennell, M.R.C.S.
Orsett	14,378	...	...	1	...	3	10	...	...	...	...	...	X	...	...	Rea Corbet, M.R.C.S.
Rochford	16,947	...	...	...	...	2	14	...	8	...	...	...	...	...	...	R. Young, M.B.
Romford	16,042	...	...	...	...	2	11	...	1	...	...	...	...	...	...	A. Wright, M.R.C.S.
Saffron Walden	12,458	...	...	...	...	...	5	...	...	...	...	...	...	...	...	W. Armistead, M.B.
Stanstead	6,481	...	...	...	...	...	...	...	...	...	...	...	...	...	...	J. A. Turner, M.B., D.P.H.
Tendring	20,152	...	...	1	...	1	1	...	...	...	...	...	XXX	...	...	J. W. Cook, M.D.
County Borough of West Ham	204000	...	...	138	...	...	75	...	23	...	1	...	...	...	...	C. Sanders, M.B.



# METEOROLOGICAL DATA.

Station of Royal Meteorological Society, Chelmsford.

Observer ... JOHN C. THURTELL



June.

Mean Temp. of Dry Bulb Thermometer ...	1898	899
" of Wet Bulb	61.6	63.7
" of Maximum	57.5	60.5
" of Minimum	70.2	73.95
Maximum Temperature	49.2	53.2
Date	79.2	82.5
Minimum Temperature	15th & 16th	21st
Date	36.8	46.1
Mean Temperature for Month	21st	17th
Mean daily range of Temperature	59.2	63.56
Relative Humidity	21.0	20.77
No. of Rainy Days	77	72
Rainfall in inches	6	10
	64	2.96

## COMPARISON OF NUMBERS OF INFECTIOUS DISEASES NOTIFIED DURING JULY, 1898, AND JULY, 1899.

	Urban Districts.		Rural Districts.	
	1898	1899	1898	1899
Small Pox	...	0	0	0
Cholera	...	0	0	0
Diphtheria	...	87	103	31
Croup	...	3	1	0
Erysipelas	...	40	43	25
Scarlet Fever	...	131	132	30
Typhoid & Allied Fevers	...	36	49	8
Totals	...	297	428	94
				134





1899.

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# SUMMARY OF THE REPORTS

OF THE

DISTRICT MEDICAL OFFICERS OF HEALTH

IN THE

ADMINISTRATIVE COUNTY OF ESSEX,

For the Year 1898.

---

*PREPARED FOR THE COUNTY COUNCIL,*

BY

JOHN C. THRESH, D.Sc., M.D., D.P.H., etc.,


*County Medical Officer of Health.*

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Chelmsford:

PRINTED BY JOHN DUTTON, 8, TINDAL STREET.





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## PREFACE.

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This report is based chiefly upon the Annual Reports of the Medical Officers of Health for the various districts in the County, but here and there I have ventured to introduce and discuss subjects bearing upon the sanitary well-being of the county, which only indirectly arise out of the subject matter of these reports. I would more particularly refer to the proposed schemes for draining the Lea and Roding Valleys, and the water supply to the rapidly increasing population in the south-western portion of the county. This great increase in population is certain to continue, and the sanitary problems consequent thereon, which will arise ere long, cannot receive attention too early.

The summary of each report, in Part II., has been revised by the Medical Officer for the district to which it refers, and I have again to thank them for this assistance, and also for the monthly returns of Infectious Disease notified, from which the charts on pages 24 to 29 have been prepared. These charts shew at a glance the seasonal prevalence of such diseases, and enable us to compare the past year with the means for previous years.

I am sorry to find that there are still several districts in which the Sanitary Authorities do not cause the Medical Officers' Annual Reports to be printed. It would appear as though the authorities either consider them not worth the trifling cost of reproduction, or think that their publication is undesirable. Both views are in my opinion incorrect. The reports for the following districts were in manuscript: Braintree, Ilford, Shoebury, Witham, and Woodford Urban, and Braintree Rural. The following were type-written: Halstead and Maldon Urban, and Halstead, Rochford, and Tendring Rural. All others were printed.

JOHN C. THRESH.



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B.—Table of Population, Births, and New Cases of Sickness during the year 1898, classified according to Diseases, Ages, and Localities.



## SECTION I.

## CHANGES IN THE ADMINISTRATIVE COUNTY.

During the year under consideration Burnham-on-Crouch and Wyvenhoe have become Urban Districts. This increases the number of Urban Districts to 29.

## POPULATION OF THE COUNTY.

Accepting the estimates of the Medical Officers of Health given in the Table B of the Local Government Board, the population in the middle of the year was as under :—

In the 29 Urban Districts	...	488,809
In the 17 Rural Districts	...	257,991
Total	...	746,800
The Registrar-General's estimate would		
be approximately	... ..	695,000
Difference	...	51,800

Comparison with the returns of previous years shews that the rapidity with which the population is increasing becomes each year more considerable. The increase during the past year was no less than 42,420. In another five years the population will be at least one million. The increase is almost limited to the South and South-East, from Walthamstow to Southend, East Ham, Walthamstow, Ilford and Leyton shewing by far the largest increase.

There is probably a slight over-estimate in the urban population, since some Medical Officers compute the population by adding both the excess of births over deaths and the inhabitants of houses erected during the year. As almost certainly some of the tenants occupying these houses previously resided in the same town, such an estimate must be too high.

### THE COUNTY BIRTH-RATE.

The total number of births registered in the Urban Districts (excluding Burnham) is 13,962, and in the Rural Districts 6,200. In both districts the Birth-rate is decreasing, but more rapidly in the towns than in the country. The rate for the County, 27·0, is 2·4 below that for England and Wales.

#### BIRTH - RATES.

**TABLE I.**

	Birth-rates, 1898, per 1,000 population.	Birth-rates, 1897, per 1,000 population.	Mean Birth-rates for the seven years 1890- 1896, per 1,000 population.
In Rural Districts ... ..	24 0	24·7	26·64
In Urban Districts ... ..	28·7	30·2	31·3
Administrative County ...	27·0	28·2	29·4
England and Wales ... ..	29·4	29·7	30·4

### THE COUNTY DEATH-RATE.

The total number of deaths registered during the year in the Urban Districts was 6,724, and in the Rural Districts 3,814. Corrected for the deaths in the County Asylum, etc., we get 6,866 for the Urban Districts and 3,672 for the Rural Districts. With these corrections, the Death-rates in the two Districts become 14·0 and 14·3 respectively. The mortality has apparently been slightly higher in the country than in the towns, but with the uncertainty as to the true population of the former, and the very slight difference in the rates, it would not be safe to assert that such has actually been the case. Moreover, there can be little doubt that the population of some of the Urban Districts is over-estimated, and this naturally lowers the Death-rate.



Compared with previous years there is a decided decrease, and compared with England and Wales for the same year the result is satisfactory, in so far as it is no less than 3·5 per 1,000 lower.

DEATH-RATES FROM ALL CAUSES PER 1,000 POPULATION.

TABLE II.

Death-Rates.	1898.	1897.	Mean for seven years, 1890-1896.
Whole of Rural Districts	14·3	14·74	15·6
Whole of Urban Districts ...	14·0	14·94	15·5
Administrative County ..	14·1	11·87	15·5
England and Wales ... ..	17·6	17·4	18·6

In Tables VII. and VIII. (pages 18 and 19) are given the Death-rates from all causes and from various diseases in each district in the County. As is usually the case, there are considerable variations in the smaller districts, due doubtless to accidental causes. In the Urban Districts the extremes are :— Witham (8·5), lowest, and Halstead (16·5), highest. In the Rural Districts, Stanstead (9·7) is lowest and Rochford (16·5) highest. It will be observed that in no district has the average been nearly so high as for England and Wales. The abnormal dryness of last summer, with the consequent scarcity of water, does not appear to have had any untoward effect, since the Death-rates for both towns and country are lower than any previously recorded in the Administrative County. No doubt the increase in population is due chiefly to the influx of families in the prime of life amongst whom the death-rate is very low; but if the necessary correction could be made for this, it would not seriously increase the recorded rate.

## INFANTILE MORTALITY.

The mortality amongst infants under one year of age has been unusually high both in town and country, the Death-rates in both being higher than I have previously recorded. It is noteworthy also that in England and Wales the rate has only once been so high during the previous ten years. This subject is referred to in several reports and is apparently due chiefly to epidemic diarrhœa, which was very widely prevalent during the autumn. The excess is much more marked in the Urban than in the Rural Districts.

## INFANTILE MORTALITY.

TABLE III.

Deaths of Infants under one year of age per 1,000 Births.

	Rural Districts	Urban Districts.	County.	England and Wales.
1898	113	153	141	161
1897	107·	131	125	156
1896	103·	136	124	148
1895	108·	148	133	161
1894	97·5	117	109	137
1893	99·	136	122	159
1892	97	139	118	148
1891	99·5	122	113	149
1890	107·5	143	127	151
Average for 9 years ...	103·5	136·	124	152

From Tables VII. and VIII. it will be seen that the rate has been generally high, and in some of the Urban Districts the rate has exceeded the average for England and Wales. The highest rates were recorded in the following districts, Barking as usual, being at the head of the list :—

Barking	...	180
Romford	...	177
Southend	...	170
Walthamstow	...	169
Shoeburyness	...	167
East Ham	...	163
Wanstead	...	163



The lowest rates occurred in the under-mentioned districts :—

Witham	...	...	57
Chelmsford (R.)	...	...	80
Lexden and Winstree	...	...	80
Dunmow	...	...	83
Belchamp	...	...	87
Stanstead	...	...	90
Maldon (R.)	...	...	92
Brightlingsea	...	...	93

#### DEATHS FROM THE SEVEN PRINCIPAL ZYMOTIC DISEASES.

The total number of deaths recorded during the year considerably exceed those for the previous year, but the excess is due chiefly to Measles and Diarrhœa. In 1897 there were only 114 deaths from Measles, as compared with 246 in 1898; and the records for Diarrhœa were 658 in 1897, against 811 during last year. Diphtheria, unfortunately, also shews a slight increase.

#### DEATHS FROM ZYMOTIC DISEASES.

TABLE IV.

	Urban Districts.	Rural Districts.	Total.
Small-pox ... ..	1	0	1
Scarlet Fever ... ..	27	10	37
Diphtheria and Croup ..	179	57	236
Fevers ... ..	96	44	140
Measles... ..	190	56	246
Whooping Cough ... ..	155	46	201
Diarrhœa ... ..	660	151	811
Totals ... ..	1308	364	1672



The next Table gives the Death-rates for the last nine years from all the zymotic diseases in the Urban and Rural Districts in the County and in England and Wales. Usually the Zymotic Death-rate for the County is a little lower than for the whole country, but for 1898 the rate has been decidedly higher. Considering that the general Death-rate is so much lower than for England and Wales, this continued prevalence of infectious diseases appears to indicate that everything possible is not being done to prevent the spread of infection. The sanitary condition of the County and the sanitary administration in the various districts cannot be considered satisfactory whilst this excessive mortality continues. The provision of proper hospitals for the isolation of patients, the provision of steam apparatus for disinfecting bedding and clothing, the more thorough disinfection of premises, and the removal of insanitary conditions generally will undoubtedly prevent epidemics of infectious disease and reduce the mortality therefrom.

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

**TABLE V.**

	1898.	1897.	1896.	1895.	1894.	1893.	1892.	1891.	1890.
In the Urban Districts ...	2·68	2·45	2·25	2·84	1·89	2·82	2·80	1·74	2·57
In the Rural Districts ...	1·41	1·12	1·34	1·51	1·35	1·93	1·15	1·32	1·45
In the Administrative County	2·20	1·97	1·89	2·31	1·64	2·43	2·17	1·55	2·04
In England and Wales ...	1·75	2·15	2·18	2·14	1·76	2·47	1·92	1·83	2·03

DEATH-RATES PER 1,000 POPULATION FROM EACH OF THE  
SEVEN PRINCIPAL ZYMOTIC DISEASES, 1898.

TABLE VI.

	Small-pox.	Scarlet Fever.	Diphtheria and Croup.	Fevers.	Measles.	Whooping Cough.	Diarrhoea.	Totals.
Rural Districts ..	0	·04	·22	·17	·21	·17	·58	1·39
Urban Districts ..	0	·055	·36	·20	·38	·31	1·35	2·655
Administrative County	0	·05	·31	·18	·32	·26	1·08	2·20
England and Wales ...	·01	·11	·24*	·18	·41	·31	·96	2·22
Administrative County, Mean of 8 years, 1890-7	·001	·09	·46	·19	·29	·36	·57	2·00

\* Diphtheria only.

The Death-rates from the seven principal Zymotic diseases in the Urban Districts have varied enormously. For example, in Witham the rate was only ·3, whereas in Romford it was 4·6, or nearly 15 times as high. The Urban Districts in which the zymotic mortality has been markedly high are :—

Romford	...	4·6
Wyvenhoe	...	3·7
Walthamstow	...	3·5
Leigh-on-Sea	...	3·5
Barking	...	3·5
Clacton	...	3·1
Waltham Cross	...	3·1
Leyton	...	2·8
East Ham	...	2·7
Colchester	...	2·7



Such high rates have not prevailed in any of the Rural Districts, but in several the mortality has been excessive.

Romford	...	...	2·5
Epping	...	...	2·3
Orsett	...	...	2·2
Rochford	...	...	2·2
Billericay	.	...	1·8

Halstead has had by far the lowest mortality. In fact, in No. 1 District not a death occurred from any infectious disease, and in No. 2 District the Zymotic Death-rate was only ·33.

#### PHTHISIS.

The Death-rate from Consumption of the Lungs has also varied very greatly, but taking the County as a whole, the Death-rate from this disease appears to be decreasing.

The total number of deaths from Phthisis during the year is 694, giving a death-rate of ·93 per 1,000 inhabitants. In the Urban Districts there were 464 such deaths, equal to ·96 per 1,000; whilst in the Rural Districts there were 230 deaths, or ·89 per 1,000.

Several of the smaller districts have had a high death-rate from Phthisis during the year, but these are all probably accidental.

A meeting was held during the year in London, and presided over by H.R.H. the Prince of Wales, to consider the question of the preventability of Tuberculosis. A National Association was formed, which has commenced a vigorous crusade of an educational character, teaching that Phthisis and other tubercular diseases are eminently preventable, and the steps to be taken to prevent them. The Marquis of Salisbury stated at the meeting that little or nothing could be expected of legislation, and that the education of the public, more especially by the medical profession, must chiefly be relied upon. This meeting has resulted in a considerable amount of attention being given to the subject by Medical Officers of Health, and it is referred to in very many of the Annual Reports.



Dr. Brown, in his report for Colchester, says :—"Tuberculosis is one of the most fatal diseases that afflict the infantile population. . . . The kind of meat used by the inhabitants of many places is doubtless one means of its existence and extension. Milk also is looked upon with suspicion, and in towns where cattle are kept for trade purposes, without fresh air or proper means of ventilating the cowsheds, is no doubt an efficient cause of its production. But in Colchester these cannot be looked upon as the chief originators of this widespread and lingering disease. We have excellent meat, and the milk purveyed by the milk-sellers is, so far as my knowledge extends, of a pure and wholesome character. The chief cause of the production of this disease in the borough is damp and unhealthy, crowded small dwellings where fresh air and free sunlight are at a discount."

With reference to Leyton, the Medical Officer of Health says :—"There is no doubt that the deaths from Tuberculosis are considerably on the increase each year. . . . The number of deaths from Phthisis . . . is very great, and this is especially noticeable in the Returns from such an Institution as the Union Workhouse, where the sufferers have been previously exposed to all weathers, and have been ill-clad and badly nourished.

"In addition to these deaths from Phthisis, we must take into account the vast number of cases of Tuberculosis which affect other organs and which are not specifically classed in our statistics, and that amongst these we must put the many wasting diseases of childhood.

"It becomes incumbent, therefore, on every public body, to whose care the sanitary health of the district is entrusted, to endeavour to check by every available means the progress of any disease which is tending to become a scourge.

"This endeavour should, moreover, be the more zealously carried out in such a district as ours, where the population is

increasing rapidly and where the dangers arising from overcrowding and insanitary houses are most likely to occur.

"I am of opinion that the Sanitary Department should be authorized to take such steps with regard to Tuberculosis as it is now empowered to take with regard to cases of infectious disease which are now notifiable.

"Considerable service could be done by the offer of the Sanitary Authority to undertake, free of cost, the disinfection of any room, bedding, etc., when a fatal case has occurred."

In the Waltham Holy Cross Report the Medical Officer of Health says:—

"Tuberculosis is a general term used to designate all forms of disease produced by a living organism called the Tubercle Bacillus.

"The President of the Local Government Board has pointed out that the death-rate of England and Wales has been materially reduced of late years owing to sanitation, and such reduction is chiefly noticeable in the number of deaths from Phthisis, the most frequent form of Tuberculosis, and that milk is the most common vehicle in which the tubercle bacillus is introduced into the human body.

"The English people are the only civilized nation using uncooked milk, and when it is generally known that milk boiled for a single instant . . . will destroy the virus of tubercle, it is confidently hoped that this simple preventive method will be practised in all households, and the prejudice against cooked milk, which is unfounded, will cease.

"To control the production and distribution of milk that may be infected with tubercle, it is most essential that all cows and cowsheds in the country should be under the constant supervision of skilled persons, for there is reason to believe that city dairies are palaces compared with some of our country sheds. Are all dairies and cowsheds sanitary, and do they receive constant and skilled supervision?"



The Medical Officer of Health for the Maldon Rural District says :—

“ The microbe gets into the system in the following ways :—(a) with food, (b) with the air we breathe.

“ **FOOD.** A considerable number of milch cows are tuberculous, and if the tubercular disease affects the udder of the cow, the milk will contain tubercle bacilli, and when consumed unboiled, it is capable of communicating the disease to human beings, especially to infants and young children.

“ The flesh of a tubercular animal may contain the bacilli, and if these are not killed by cooking, such meat may communicate tuberculosis to the consumer.

“ Both these dangers may be guarded against by efficient cooking, since the infective organism is very quickly killed by a heat approaching that of boiling water.

“ The spread of tuberculous disease amongst cows is facilitated by overcrowding in badly-ventilated cowsheds. Inspection to prevent such overcrowding and to ensure cleanliness is therefore essential. Unfortunately, efficient meat inspection is impossible in rural districts.

“ **AIR.** Persons suffering from consumption expectorate a good deal, and the “ phlegm ” is usually loaded with bacilli. If the expectoration is allowed to dry on the floors or elsewhere, it ultimately becomes converted into dust, gets blown about, and so may be inhaled and infect others with the disease.

“ The filthy habit of expectorating should be abandoned, and persons suffering from consumption should either use a special spitting cup or soft rags. The former can be cleansed and disinfected with boiling water, and the latter can be burned. Houses or rooms which have been inhabited by persons in an advanced stage of the disease should afterwards be thoroughly cleansed and disinfected.

“ It is now fully recognised that consumption in its early stages is curable. The bacteriological examination of the sputum affords the earliest information of the presence of the tubercle bacilli.



"The establishment of Sanatoria for consumptive patients for the open-air treatment with suitable dieting is greatly to be desired, and the National Association for the Prevention of Consumption is about to try the experiment of establishing such Sanatoria, on a self-supporting basis. I should like to see such an establishment on the elevated ground near Althorne overlooking the valleys of the Blackwater and Crouch, and another on Danbury Hill."

The Medical Officer of Health for Chelmsford Borough thinks Phthisis should be made a notifiable disease, "for it is undoubtedly spread by overcrowding, and by insanitary and damp dwellings; but of course if it came under the Notification Act it would be necessary for Sanitary Authorities to provide suitable Hospital accommodation." He advocates greater powers for the supervision of dairies and cowsheds, and that the milk from any cow showing any suspicion of Tubercular disease should be at once rigidly excluded from any supply. His remarks with reference to the want of general cleanliness in cowsheds are unfortunately too true. "As regards the cow itself, I myself have never heard of or seen any precaution taken to prevent added dirt or filth coming in contact with the milk, when the process of milking is going on; by this I mean that the cow itself is practically never subjected to any grooming or cleansing previous to milking; and when one thinks that during the winter, at any rate, cows are kept more or less in stalls, they have to lie down on litter that is grossly contaminated with filth, it is quite impossible to prevent some of this filth from getting into the milk. Again, it is the rarest possible thing to see the dairyman go and thoroughly cleanse his hands previous to milking, to start with, I know that frequently their hands are not as clean as one might wish.

"I know, of course, that many will say that these are absurd precautions, but, as is well known, milk is a very productive media for a large number of bacteria. As it is also a staple article of diet for the sick, I am very strongly of opinion that all possible precautions should be taken to keep it as pure and as free from any added dirt as possible."



BIRTH-RATES AND DEATH-RATES.  
TABLE VII.

	URBAN DISTRICTS.	Birth-rate.	Infantile Mortality	Death-rates from			Medical Officers of Health.	Esti- mated Popula- tion.
				All Causes.		Seven principal Zymotic Diseases.		
				Cor- rected.	Uncor- rected.			
1	Barking ..	36.2	180	16.0	..	3.50	C. F. Fenton, L.R.C.P., M.R.C.S.	20,000
2	Bramtree ..	21.8	110	15.0	..	2.00	P. R. Stevens, L.R.C.P., M.R.C.S.	5,400
3	Brightlingsea ..	27.4	93	12.3	..	1.16	H. S. Cooper, L.R.C.P., M.R.C.S.	4,295
4	Buckhurst Hill ..	21.0	151	10.4	..	.00	A. Ambrose, M.D., D.P.H.	4,700
5	Burnham ..	..	..	..	14.8	.60	C. F. Downman, L.R.C.P., M.R.C.S.	2,576
6	Clacton ..	26.15	140	12.8	..	3.16	J. W. Cook, M.D.	6,002
7	Chelmsford ..	27.1	80	13.3	..	1.50	H. W. Newton, L.R.C.P., M.R.C.S., D.P.H.	11,997
8	Chingford ..	24.7	88	9.8	..	1.35	T. S. Taylor, M.B.	3,682
9	Colchester ..	23.8	138	14.7	..	2.70	G. Brown, M.D.	40,710
10	East Ham ..	37.3	163	14.3	..	2.70	A. W. Beaumont, M.D.	70,000
11	Epping ..	27.3	96	13.2	..	1.10	T. Fowler, L.R.C.P.I., L.R.C.S.I., D.P.H.	3,396
12	Grays ..	27.6	145	10.2	..	2.17	S. H. Snell, M.D., D.P.H.	14,750
13	Halstead ..	23.0	144	16.5	..	1.26	C. G. Roberts, M.B.	6,300
14	Harwich ..	34.7	129	15.3	..	2.60	H. Gurney, L.R.C.P., L.R.C.S.	8,703
15	Ilford ..	25.7	153	10.2	..	2.20	J. Shimeld, L.R.C.P., L.R.C.S.	27,178
16	Leigh-on-Sea ..	27.2	147	14.9	..	3.50	W. D. Watson, M.R.C.S., L.R.C.P.	3,750
17	Leyton ..	28.4	150	12.8	..	2.80	A. F. Peskett, M.R.C.S.	90,000
18	Maldon ..	*27.0	148	14.6	..	1.6	H. R. Brown, M.B., C.M.	5,729
19	Romford ..	28.5	177	15.2	..	4.60	A. Wright, M.R.C.S.	10,500
20	Saffron Walden ..	22.3	146	13.0	..	.97	W. Armistead, M.B.	6,134
21	Shoeburyness ..	33.2	167	10.9	..	1.20	E. W. Walter, M.R.C.S.	4,128
22	Southend-on-Sea ..	26.7	170	14.5	..	2.60	A. C. Waters, M.B.	22,583
23	Waltham Holy Cross ..	25.2	134	13.1	..	3.10	J. D. Priest, M.R.C.S., D.P.H.	6,780
24	Walthamstow ..	28.7	169	13.5	..	3.50	J. J. Clarke, L.R.C.P.I., D.P.H.	80,000
25	Wanstead ..	20.1	163	10.7	..	.80	F. Argles, M.R.C.P.Ed., M.R.C.S.	7,950
26	Walton-on-the-Naze ..	23.6	128	15.1	..	.60	J. W. Cook, M.D.	1,649
27	Witham ..	20.6	57	8.5	..	.30	W. D. Gimson, M.D.	3,400
28	Woodford ..	24.9	145	11.7	..	1.70	W. G. Groves, M.R.C.S.	13,837
29	Wyvenhoe ..	28.1	144	16.3	..	3.70	G. P. Smith, L.S.A.	2,700

1st April to December 31st.

TABLE VIII

RURAL DISTRICTS.	Birth-rate.	Infantile Mortality	Death-rates from			Medical Officers of Health.	Esti- mated Popula- tion.
			All Causes.		Seven principal Zymotic Diseases.		
			Cor- rected.	Uncor- rected.			
1 Belchamp	18.0	87.	13.8	..	.80	J. S. Holden, M.D.	5,722
2 Billericay	22.3	123.	12.8	..	1.80	F. Carter, M.D.	20,564
3 Braintree	19.9	104.	13.9	..	.80	T. Carr, M.D., D.P.H.	19,734
4 Bumpstead	19.0	145.	12.1	..	.30	W. Armistead, M.B.	2,886
5 Chelmsford	22.1	132.	15.6	..	.97	J. C. Thresh, M.D., D.Sc., D.P.H.	23,603
6 Dunmow	22.4	83.	13.5	..	.90	E. E. Goodbody, M.D.	16,674
7 Epping	25.7	108.	15.2	..	2.30	T. Fowler, L.R.C.P.I., L.R.C.S.I., D.P.H.	16,873
8 Halstead, No. 1	19.9	101.	12.5	..	.00	J. H. Ashworth, M.D.	4,955
9 Halstead, No. 2	23.6	133.	14.0	..	.33	J. B. Bromley, M.R.C.S.	6,048
10 Lexden and Winstree	24.1	80.	13.5	..	1.00	J. W. Cook, M.D.	21,087
11 Maldon	25.0	92.	16.0	..	1.15	J. C. Thresh, M.D., D.Sc., D.P.H.	15,710
12 Ongar	22.4	101.	13.5	..	.60	J. C. Quennell, M.R.C.S.	10,557
13 Orsett	32.4	132.	15.3	..	2.20	Rea Corbet, M.R.C.S.	16,774
14 Rochford	26.3	130.	16.5	..	2.20	R. Young, M.B.	14,524
15 Romford	29.6	119.	13.4	..	2.50	A. Wright, M.R.C.S.	18,560
16 Saffron Walden	20.2	147.	13.7	..	1.12	W. Armistead, M.B.	12,458
17 Stanstead	17.1	90.	9.7	..	1.10	J. A. Turner, M.B., D.P.H.	8,958
18 Tendring	23.8	107.	13.6	..	1.20	J. W. Cook, M.D.	22,224



## SECTION II.

## PREVALENCE OF ZYMOTIC DISEASES.

The Infectious Diseases (Notification) Act having been adopted in every District in the County, our returns are very complete. I find, however, that the totals of the monthly returns kindly furnished me by all the Medical Officers of Health do not always correspond with the totals in the annual reports.

Table IX. gives the total number of cases of each disease notified yearly since 1891. The figures for that year, however, should not be used for comparative purposes, as several districts only adopted the Notification Act during the year ; hence the returns are incomplete. It must be remembered also that the population of the County is continuously increasing. When this is taken into consideration and the number of cases notified annually per 1,000 population calculated, it will be seen that there is, speaking generally, a steady diminution going on of cases notified. Taking the diseases separately, it is not satisfactory to find that Typhoid Fever is the only disease which shews no signs of decreasing.

Number of Cases of Infectious Diseases Notified per 1,000 Inhabitants in the Administrative County.			
1892	...	...	10·0
1893	...	...	13·3
1894	...	...	9·5
1895	...	...	8·9
1896	..	...	9·0
1897	...	...	8·2
1898	...	..	7·2

TABLE IX.

TOTAL NUMBER OF CASES OF INFECTIOUS DISEASES  
NOTIFIED, 1891—1898.

	Small-pox.	Scarlet Fever.	Diphtheria and Croup.	Fevers—Typhoid and Continued.	Puerperal Fever.	Erysipelas.	Totals.
1898	5	2,371	1,418	854	30	664	5,342
1897	0	2,956	1,256	773	48	710	5,743
1896	19	2,931	1,437	888	43	733	6,051
1895	63	2,482	1,738	712	26	661	5,682
1894	420	2,511	1,619	648	37	785	6,020
1893	235	3,952	2,009	776	61	1,100	8,133
1892	33	3,013	1,613	490	24	797	5,970
1891 (incomplete)	11	1,402	1,257	400	27	413	3,510
Average for the 8 years ..	98	2,702	1,543	692	37	733	5,806

In Colchester and Ilford Measles has been added to the list of diseases notifiable, and in Ilford Whooping Cough also has been scheduled. The opinions expressed with reference to the desirability of scheduling these diseases will be found in the sections treating thereof. In Table X. are recorded the number of cases notified in each Urban and Rural District, together with the rate per 1,000 population.

In the Urban Districts the Case-rate was 8·3, as compared with 9·8 in 1897 and an average of 11·5 for the previous seven years. In the Rural Districts the Case-rate was 5·0, as compared with 5·5 for the year 1897 and an average of 8·6 for the previous seven years. There is, therefore, a much more marked diminution in the country districts than in the towns.



The average rate has been exceeded in the following Urban Districts :—

Braintree	...	...	17·2 per 1,000 population.
Leigh-on-Sea	...	...	16·2                   ,,
East Ham	...	...	13·2                   ,,
Southend	...	...	11·7                   ,,

and in the Rural Districts the average has been exceeded in the following :—

Rochford	...	...	8·6 per 1,000 population.
Braintree	...	..	8·0                   ,,
Orsett	...	...	7·2                   ,,
Romford	...	...	6·8                   ,,
Ongar	...	...	6·4                   ,,
Bumpstead	...	...	6·2                   ,,
Belchamp	...	...	5·7                   ,,
Halstead (No. 1)	...	...	5·8                   ,,

The lowest rates are recorded in Maldon, Brightlingsea, Epping and Chelmsford Urban Districts, and in the Tendring and Lexden and Winstree Rural Districts.

DISTRIBUTION THROUGHOUT THE COUNTY OF ZYMOTIC  
DISEASES GENERALLY.

TABLE X.

	No. of Cases Notified.	No. per 1,000 In- habitants	Diseases most prevalent.
<b>Urban Districts.</b>			
Barking ... ..	198	9.9	Diphtheria, Scarlatina & Typhoid
Braintree ... ..	93	17.2	Scarlet Fever and Diphtheria
Brightlingsea ... ..	11	2.5	Diphtheria
Buckhurst Hill ... ..	27	5.7	Typhoid and Scarlet Fever
Burnham ... ..	13	5.0	Diphtheria
Clacton ... ..	35	5.8	Diphtheria and Scarlet Fever
Chelmsford ... ..	36	3.0	Diphtheria and Typhoid
Chingford ... ..	20	5.4	Scarlet Fever and Diphtheria
Colchester ... ..	192	4.7	Scarlet Fever and Diphtheria
East Ham ... ..	928	13.2	Scarlet Fever, Diphtheria and Typhoid
Epping ... ..	9	2.6	Scarlet Fever
Grays ... ..	113	7.6	Scarlet Fever, Typhoid and Erysipelas
Halstead ... ..	26	4.1	Scarlet Fever, Diphtheria and Erysipelas
Harwich ... ..	34	3.9	Scarlet Fever, Typhoid and Erysipelas
Ilford ... ..	206	7.5	Scarlet Fever, Diphtheria and Typhoid
Leigh-on-Sea ... ..	61	16.2	Diphtheria and Typhoid
Leyton ... ..	709	7.8	Scarlet Fever, Diphtheria and Typhoid
Maldon ... ..	9	1.5	Diphtheria and Typhoid
Romford ... ..	75	7.1	Diphtheria, Scarlet Fever and Typhoid
Saffron Walden ... ..	15	2.4	Diphtheria
Shoeburyness ... ..	45	10.9	Typhoid
Southend ... ..	265	11.7	Typhoid, Scarlet Fever and Diphtheria
Waltham Holy Cross ... ..	46	6.7	Diphtheria and Scarlet Fever
Walthamstow ... ..	688	8.6	Scarlet Fever, Diphtheria and Typhoid
Wanstead ... ..	87	10.1	Scarlet Fever and Diphtheria
Walton-on-the-Naze ... ..	8	4.8	Diphtheria
Witham ... ..	15	4.4	Scarlet Fever
Woodford ... ..	75	5.4	Scarlet Fever
Wyvenhoe ... ..	14	5.2	Diphtheria
<b>Rural Districts.</b>			
Belchamp ... ..	33	5.7	Scarlet Fever and Diphtheria
Billericay ... ..	92	4.5	Scarlet Fever and Typhoid
Braintree ... ..	158	8.0	Scarlet Fever and Diphtheria
Bumpstead ... ..	18	6.2	Scarlet Fever
Chelmsford ... ..	99	4.2	Scarlet Fever and Typhoid
Dunmow ... ..	61	3.6	Diphtheria
Epping ... ..	71	4.8	Scarlet Fever and Diphtheria
Halstead, No. 1 ... ..	29	5.8	Scarlet Fever
Halstead, No. 2 ... ..	18	2.9	Scarlet Fever



TABLE X.—*continued.*

RURAL DISTRICTS— <i>continued.</i>			No. of Cases Notified.	No. per 1,000 In- habitants.	Diseases most prevalent.
Lexden and Winstree	...	...	70	3.3	Diphtheria, Scarlet Fever and Typhoid
Maldon	...	...	60	3.8	Scarlet Fever and Typhoid
Ongar	...	...	68	6.4	Scarlet Fever and Diphtheria
Orsett	...	...	121	7.2	Typhoid, Scarlet Fever and Diphtheria
Rochford	...	...	125	8.6	Scarlet Fever, Typhoid and Diphtheria
Romford	...	...	127	6.8	Scarlet Fever, Diphtheria and Typhoid
Saffron Walden	...	...	43	3.4	Scarlet Fever
Stanstead	...	...	28	3.1	Diphtheria and Scarlet Fever
Tendring	...	...	58	2.6	Typhoid and Diphtheria

The following series of Charts are compiled from the monthly returns of the Medical Officers of Health, and shew the marked effect of season upon the prevalence of infectious diseases.

CHART I.

DIPHTHERIA AND CROUP.  
URBAN DISTRICTS.

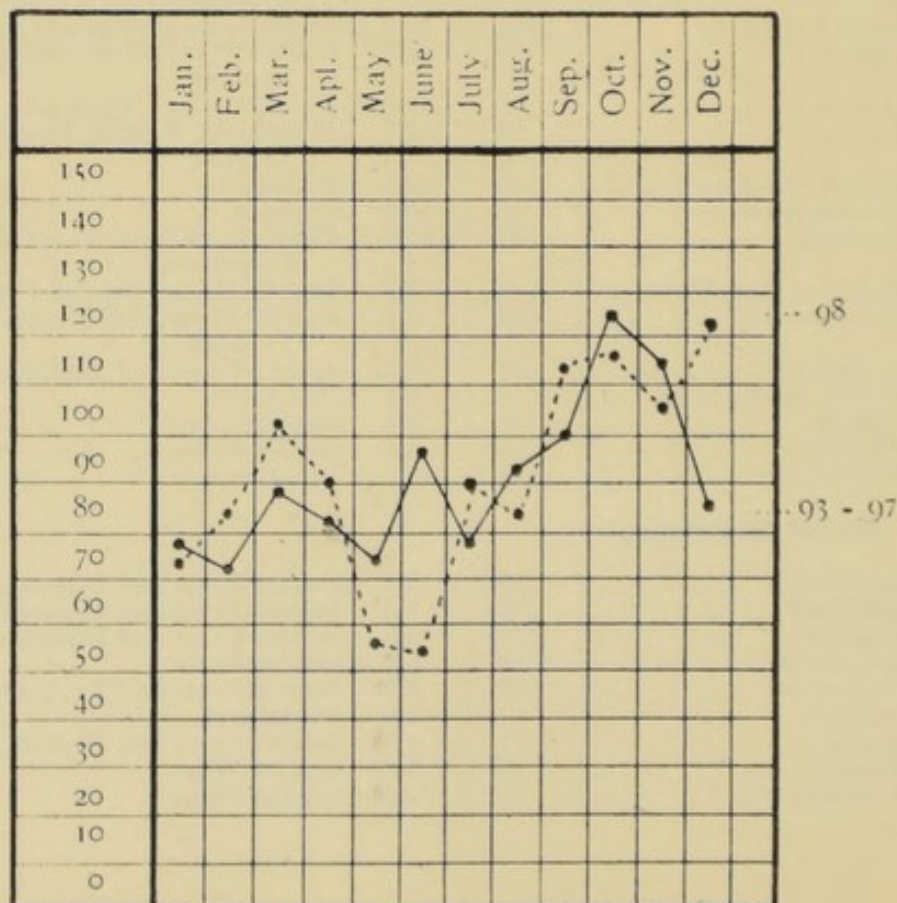


CHART II.  
SCARLET FEVER.  
URBAN DISTRICTS.

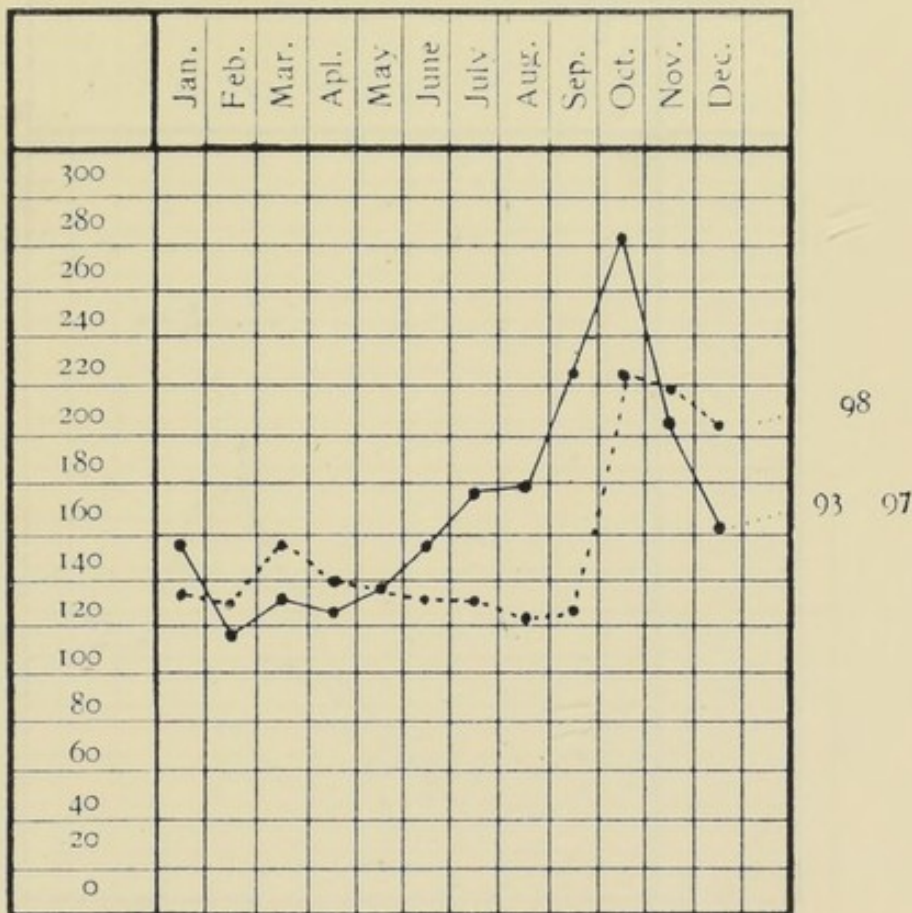




CHART III.  
TYPHOID AND ALLIED FEVERS.  
URBAN DISTRICTS.

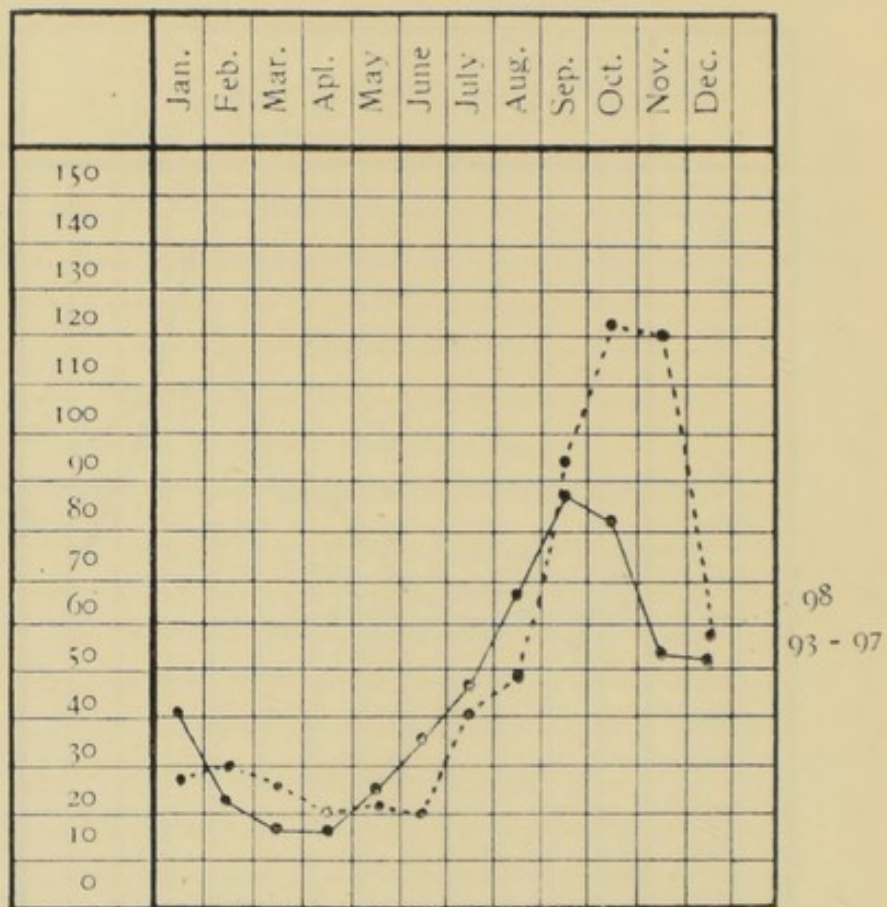


CHART IV.  
DIPHTHERIA AND CROUP.  
RURAL DISTRICTS.

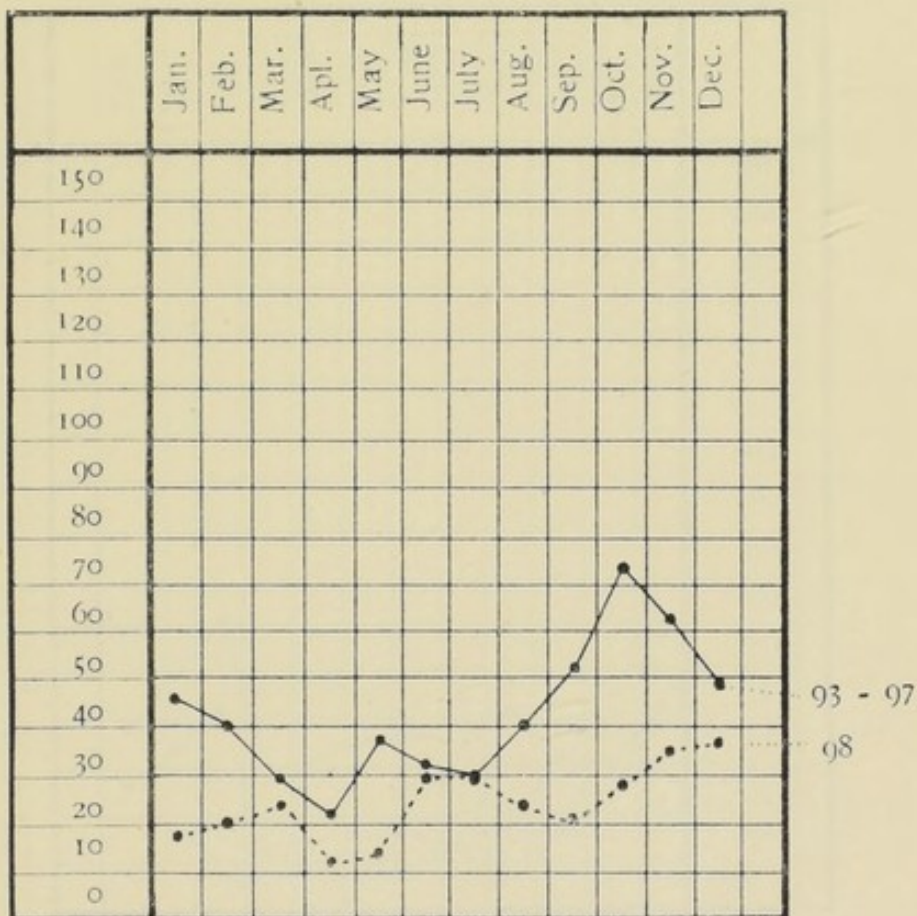
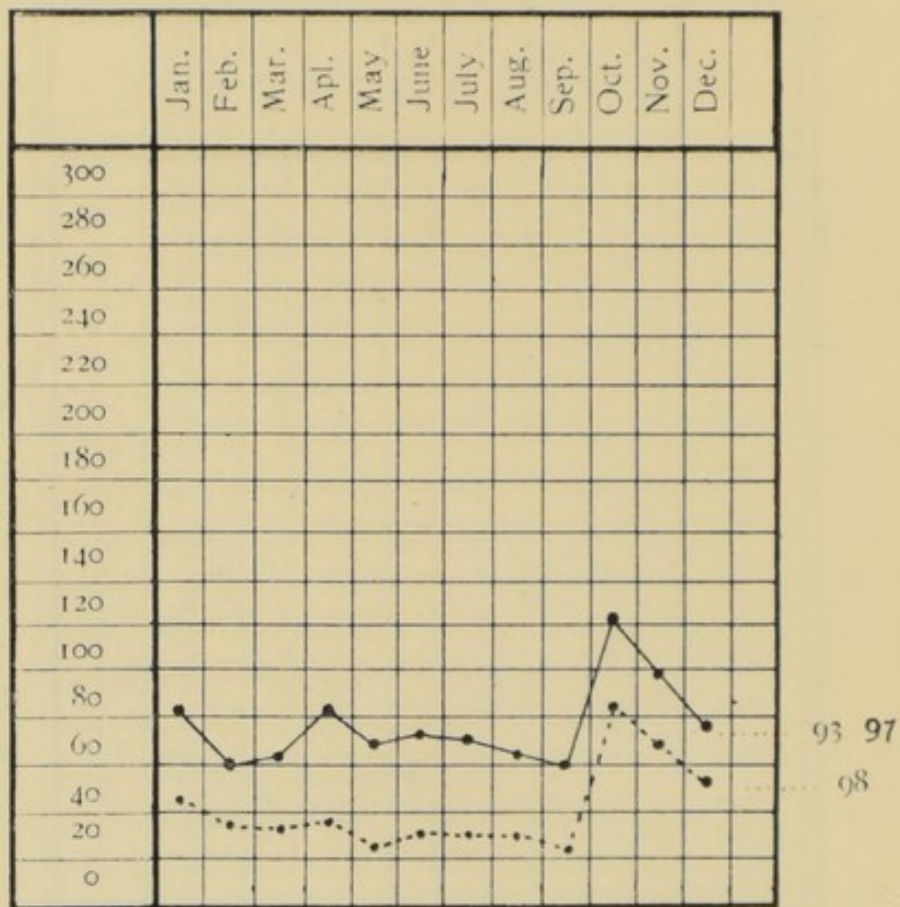




CHART V.  
SCARLET FEVER.  
RURAL DISTRICTS.







## SMALL-POX.

Five cases only occurred during the year, one in East Ham, one in Leyton, two in Waltham Holy Cross, and one in Orsett Rural District. No particulars are given about the case at East Ham. At Leyton "the only likely source of infection that could be traced was the handling of documents from Middlesborough, where at that time this disease was very severe." At Waltham Holy Cross "The first case was a child aged five, at Long Street, Copt Hall Green, notified on June 17th, and died on the following day; the body, duly disinfected, was removed to the mortuary and buried on the 19th. Notice of the second case was received on June 30th and was a brother of the deceased child. Prior to the second case being notified, the contents of the infected room had been destroyed by fire, and all exposed persons re-vaccinated. The second case was of the modified or variloid type, and made a good recovery. The primary infection was probably contracted in London, but there was no definite proof to that effect. Rigid isolation, re-vaccination of exposed persons, destruction of infected articles, and the offer of re-vaccination to the inhabitants of the Hamlet, were the successful methods employed in arresting the spread of the disease."

The case which occurred in the Orsett district was that of a Lascar at the Tilbury Docks, and he was at once removed to the Cottage Hospital there.

In many reports the subject of Vaccination is referred to and the probable effect of the recent Vaccination Act discussed. Dr. Cook, the Medical Officer of Health for the Tendring, Lexden and Winstree, Walton and Clacton Districts, regards the Act, as a whole, as a retrograde step, but he approves of the use of calf lymph and of the home vaccination. He says with reference to these subjects:—"From my considerable experience with this mode of vaccination, I feel that I can speak with some force, for I visited, at the request of the late Sir George Buchanan, the calf lymph vaccination stations in Holland and Belgium, and carried on the vaccination of calves



in this country and supplied the Local Government Board, until it established the first station in Lamb's Conduit Street. . . . The risk of any disease that might exist in the calf is safeguarded by the calf used being at once killed and examined, and if any trace of disease is found the lymph is at once destroyed. . . . I also think it a wise measure that the vaccination is to be done at the home of the infant, as the Vaccinator will see for himself the condition of that home, and thus be able to judge as to the wisdom of performing the operation there."

The Medical Officer of Health for Colchester has much to say on the subject. He concludes:—"If those conscientious people who have contracted themselves out of the provisions of the Act had been compelled to pay when their objections were put forward a sum, say, from five shillings to five pounds, according to circumstances, as a fund for enabling the town where they dwell to erect hospitals for the cure and treatment of the disease when it may unfortunately break out in their neighbourhood, they would thus make certain provision for Small-pox if it should attack them, and in this manner prevent its spread."

The Medical Officer of Health for Waltham Holy Cross says:—"Vaccination and re-vaccination prevent and control Small-pox, and without Vaccination no sanitary precautions can *prevent* Small-pox, but isolation and segregation of individuals may control it. It is impossible to predict what will be the result of the omission of re-vaccination or what fruit the 'conscience' clause will bear, but the utterly absurd statements made by so-called conscientious objectors to presiding Magistrates that have appeared in the weekly press tend rather to strengthen the wavering than add recruits to the anti-vaccinationists."

In the Rochford report it is stated that the large number of conscientious objectors who have succeeded in obtaining exemption render it impossible to reckon upon immunity for any length of time. "In fact, an outbreak may be looked for



at no distant date, and I should strongly advise your Council to make provision for the isolation of cases immediately they are notified."

# SCARLET FEVER.

## TABLE XII.

Urban Districts.	No. of Cases.	No. of Deaths.	Rural Districts.	No. of Cases.	No. of Deaths.
Barking ...	69	0	Belchamp ...	14	2
Braintree ...	70	3	Billericay ...	33	0
Brightlingsea ...	1	0	Braintree ...	85	2
Buckhurst Hill ...	6	0	Bumpstead ...	11	0
Burnham ...	3	0	Chelmsford ...	55	2
Clacton ...	12	1	Dunmow ...	5	0
Chelmsford ...	8	0	Epping ...	32	2
Clingford ...	8	0	Halstead, No. 1 ...	19	0
Colchester ...	62	0	Halstead, No. 2 ...	9	0
East Ham ...	574	10	Lexden and Winstree...	17	0
Epping ...	4	0	Maldon ...	26	0
Grays ...	45	0	Ongar ...	27	0
Halstead ...	6	0	Orsett ...	30	0
Harwich ...	13	0	Rochford ...	49	1
Ilford ...	77	0	Romford ...	41	0
Leigh-on-Sea ...	1	0	Saffron Walden ...	34	0
Leyton ...	351	5	Stanstead ...	8	1
Maldon ...	0	0	Tendring ...	5	0
Romford ...	22	1			
Saffron Walden ...	4	0			
Shoeburyness ...	9	1			
Southend-on-Sea ...	99	3			
Waltham Holy Cross ...	12	0			
Walthamstow ...	293	3			
Wanstead ...	60	0			
Walton-on-the-Naze ...	2	0			
Witham ...	11	0			
Woodford ...	48	0			
Wyvenhoe ...	1	0			
Totals...	1871	27	Totals...	500	10

The above Table shews that 1,871 cases of Scarlet Fever occurred in the Urban Districts and 500 in the Rural, being 413 and 163 less respectively than in the previous year. The mortality per 100 cases was 1.56. Year by year this disease appears to be becoming milder in type, and there is no doubt that many cases now occur so slight in character that the diagnosis is difficult, if not impossible. The occurrence of these

mild cases increases the difficulty of arresting the spread of the disease. The gradual diminution in the mortality rate is well shewn in the following Table :—

			Number of Deaths from Scarlet Fever per 100 cases notified.
1893	...	...	3·7
1894	...	...	2·0
1895	...	...	2·17
1896	...	...	1·76
1897	...	...	1·66
1898	...	...	1·56

It certainly appears that, in this County at least, Scarlet Fever is a less formidable disease than Measles, since in Colchester and Ilford, the two towns in which Measles are notified, the death-rate therefrom was 2·5 per 100.

**BARKING.** The cases here were of a very mild character, and the greatest difficulty was experienced in making a diagnosis. Several children were discovered attending School “in a peeling state.”

**EAST HAM.** The disease was very prevalent here, especially during the last quarter. It became necessary to provide further accommodation, and Ranccliffe House was taken as a kind of Convalescent Home, to which patients from the Hospital at Bonny Downs were drafted.

**LEYTON.** There was a marked decrease in the number of cases here. 61 per cent. of the cases occurred during the first half of the year. The mortality per 100 cases was only 1·4, against 3·3 in the preceding year.

**MALDON (U.)** This district remained entirely free from the disease throughout the year, and is the only district in which no case occurred.

**SOUTHEND.** Several unrecognised cases occurred here and caused limited outbreaks. A slight epidemic occurred amongst the children attending Brewery Road School immediately preceding the Christmas Holidays.



WALTHAMSTOW. The Medical Officer of Health says "the spread of the disease is very often due to a belief amongst the poor and ignorant that Scarlatina is not Scarlet Fever and requires no isolation, and consequent free mingling of the infected with the rest of the household." The mortality was only 1.02 per 100 cases.

WALTHAM HOLY CROSS. -The Medical Officer of Health says :—"Of late years the type of Scarlet Fever has become more and more attenuated ; a case of Anginosa or Maligna has not been recorded since 1891."

BRAINTREE (R.) An epidemic evidently occurred here, most of the cases being in Bocking. No particulars are given.

CHELMSFORD (R.) The disease tended to become epidemic. When the first case was notified in Highwood a house-to-house visitation was made, resulting in the discovery of a number of other cases. Twelve patients were promptly removed to the Hospital, and this probably prevented an epidemic. There were other suspicious cases (five in one house), which were carefully watched. On some an evanescent rash had been observed, and some had sore throat. As none of the patients afterwards "peeled," these were possibly a form of Influenza.

EPPING (R.) The Medical Officer of Health refers to the mildness of the disease, and says this constituted the chief difficulty in eradicating the disease.

ROCHFORD. In one or two reports the infection is stated to have been introduced from London. In this district, an outbreak at Rayleigh was caused through the boarding out of a child from the East of London, sent down in the "peeling" stage.

SAFFRON WALDEN (R.) The Schools at Wimbush were closed during January and February. At Hadstock the Schools were also closed on account of a sudden outbreak. The Medical Officer of Health prevented holiday children being sent down from Stepney to Wimbush on account of the prevalence of this disease.



As so many mild cases of Scarlet Fever now occur, it may be well to draw attention to the fact that Dr. Klein has described a simple method of bacteriological diagnosis. The method adopted for obtaining the *streptococcus scarlatinae* or *conglomeratus* from the secretion of the throat is as follows:—A swab of sterile cotton-wool twisted round the end of a platinum wire or other rod is applied to the mucous membrane of the throat, and the material thus collected on this swab is washed from it with, and so distributed in, sterile salt solution. A few drops of this distribution of throat secretion in salt solution are then rubbed over the surface of nutrient agar which has already set in a sterile dish. After incubation at 37° C. for 24 hours, or at most 48 hours, colonies appear on the surface of the agar-plate, the number of them differing, of course, according to the amount of the original dilution. Amongst the colonies thus appearing are numerous small, round, translucent growths, from which sub-cultures can easily be set up in nutrient alkaline broth, incubated at 37° C. By the next day, at latest after 48 hours, it will be evident from the condition of the broth whether or no the *streptococcus scarlatinae* is multiplying in it. If it be growing therein, there is found at the bottom of the otherwise perfectly limpid broth whitish-grey nebulous flocculi, which, on further incubation of the culture, become enlarged in bulk, and produce a flocculent mass at the bottom of the tube. Examined under the microscope, these masses are seen to be entirely made up of long chains of cocci, hence the name *conglomeratus*; which chains, however, are easily disintegrated mechanically into longer or shorter fragments. Sub-culture of the microbe in sterile milk, incubated at 37° C., brings about coagulation of the milk in one to three days. This power of coagulating milk I insisted on in my reports of ten years ago, as one of the characters differentiating *streptococcus scarlatinae* from *streptococcus pyogenes*. When planted into litmus milk (blue) *streptococcus scarlatinae* rapidly turns the milk red, thus showing that it is an acid producer.



In sub-culture on agar this streptococcus exhibits the following peculiarities :—The colonies are at first small, round, and translucent. After a few days they increase considerably in size, are brown in transmitted light, and exhibit to the naked eye (better still under a magnifying glass) an irregular outline, and a characteristic spotty appearance, due to the presence of small and large nobs and thickenings distributed partly over the edge, partly over the surface of the colony. The colony thus becomes, as time goes on, more and more opaque and granular.

## DIPHTHERIA AND CROUP.

**TABLE XIII.**

Case-rate and Death-rate per 1,000 Population.

	1898.		1897.		Seven years, 1890-1896.	
	Case-rate.	Death-rate.	Case-rate.	Death-rate.	Case-rate.	Death-rate.
Rural Districts ...	1·22	·22	1·19	·28	1·91	·39
Urban Districts ...	2·25	·36	2·12	·32	3·03	·56
County ...	1·90	·31	1·67	·30	2·51	·49
England and Wales ...	...	...	...	·24	...	·22

The above Table shews that the Case-rate and Death-rate from Diphtheria and Croup have been slightly higher than in the previous year, but much below the average of the seven preceding years. The number of deaths per 100 cases has been a little lower than usual, and it seems possible that the type is diminishing in severity, or it may be that the anti-toxin system of treatment is responsible for the slight diminution in the mortality.

## Deaths per 100 cases notified.

	1898.	1897.	1896.	1895.
Rural Districts ...	18·	23·6	19·5	22
Urban „ ...	16·3	15·0	16·	19
County ...	16·6	17·1	17·	20

The mortality rate remains persistently higher in the rural districts than in the urban. This condition existed prior to the introduction of anti-toxin, and is probably not due to the mode of treatment. The more reasonable explanation is, that in towns many mild and doubtful cases are notified which in country places would never come to the knowledge of the Medical Officer of Health. There is no doubt that there are many errors made in the diagnosis of this disease. In fact, the Medical Officer of Health for one Urban District states that probably half the cases notified to him during the year were not true Diphtheria. The results (*vide* Appendix) of the bacteriological diagnosis of 100 suspected cases, made in my laboratory, tends to shew that without this aid many errors must result from the mere clinical examination. Out of this 100 cases, 49 proved to be true Diphtheria, whilst in 51 no evidence could be found of the presence of the specific bacillus. On the other hand, there may occur many unsuspected cases, which escape diagnosis and notification.

With reference to a very important matter bearing on the dissemination of the disease and the valuable aid afforded by bacteriological examinations, the following extract from the Woodford report may be quoted :—

“The freedom of the district (Woodford) from this disease was remarkable, more especially when its prevalence in one of the neighbouring districts is taken into account. I think some credit may fairly be taken on account of the procedure adopted, . . . on my advice. No scholar is allowed to return to school after having had Diphtheria until he or she has a certificate of freedom from infection, based upon a bacteriological examination\* of the secretion from the throat, the District Council paying, when necessary, fees for the examinations. It has been found that infection exists for six, seven, or even eight weeks *after, to all appearances, the patient is quite well*. I personally believe that by the universal adoption of this practice the disease might be very materially lessened, if

\* These examinations were all made in my laboratory at Chelmsford. J.C.T.)



not altogether stamped out. Culture tubes are provided also in doubtful cases where the patients are not in a position to pay for them themselves, so that an accurate diagnosis may be made as early as possible."

The following Table shews the distribution of the disease throughout the county during the year, and also the number of deaths which occurred therefrom in each district.

## DIPHTHERIA AND CROUP.

TABLE XIV.

Urban Districts,	No. of Cases.	No. of Deaths.	Rural Districts,	No. of Cases.	No. of Deaths.
Barking ... ..	74	7	Belchamp ... ..	8	1
Braintree ... ..	17	6	Billericay ... ..	13	3
Brightlingsea ... ..	6	0	Braintree ... ..	44	7
Buckhurst Hill ... ..	3	0	Bumpstead ... ..	0	0
Burnham ... ..	5	3	Chelmsford ... ..	8	0
Clacton ... ..	16	1	Dunmow ... ..	36	7
Chelmsford ... ..	13	0	Epping ... ..	27	7
Chingford ... ..	7	1	Halstead, No. 1 ... ..	7	0
Colchester ... ..	64	25	Halstead, No. 2 ... ..	1	0
East Ham ... ..	217	23	Lexden and Winstree ... ..	27	9
Epping ... ..	0	0	Maldon ... ..	4	1
Grays ... ..	14	0	Ongar ... ..	25	3
Halstead ... ..	5	1	Orsett ... ..	26	7
Harwich ... ..	1	0	Rochford ... ..	16	2
Ilford ... ..	66	2	Romford ... ..	39	9
Leigh-on-Sea ... ..	35	8	Saffron Walden ... ..	1	0
Leyton ... ..	175	33	Stanstead ... ..	14	0
Maldon ... ..	4	0	Tendring ... ..	20	1
Romford ... ..	24	2			
Saffron Walden ... ..	10	2			
Shoeburyness ... ..	2	1			
Southend-on-Sea ... ..	46	7			
Waltham Holy Cross ... ..	23	4			
Walthamstow ... ..	234	46			
Wanstead ... ..	19	2			
Walton-on-the-Naze ... ..	6	0			
Witham ... ..	1	1			
Woodford ... ..	6	0			
Wyvenhoe ... ..	9	4			
Totals ... ..	1102	179	Totals ... ..	316	57

BARKING. In this district 81 cases occurred with a mortality rate of only 9·4 per cent.

The Medical Officer of Health adds: "I have again to remark after another year's treatment with Anti-Diphtheritic

serum, I am convinced of its specific value." With reference to the effect of School Attendance no definite connection could be traced. 33 per cent. of the cases occurred in houses with sanitary defects.

CLACTON. The infection was introduced by visitors on several occasions. Anti-toxin was used frequently with marked success.

CHINGFORD. A small outbreak is attributed to a child kissing another child who had been discharged four weeks previously from an Isolation Hospital, where she had been treated for Diphtheria. A case occurred in November in an isolated house in a good sanitary condition. "In spite of anti-toxin injections and the absence of the diphtheria bacillus in the throat of the patient another member of the family was attacked."

COLCHESTER. Diphtheria of a severe type was prevalent in the Borough but no comments are made thereon in the report, save, that, such as were removed received sedulous and constant care and nursing.

EAST HAM. The disease was prevalent throughout the whole year but more especially during the last three months. It was of a mild type. About 12 per cent. of the cases were sent to the West Ham Hospital.

LEIGH. The disease was very prevalent during the year, especially in the first quarter. A special report thereon was sent to the Local Government Board.

LEYTON. Over 35 per cent. of the cases occurred in the Leyton Ward.

ROMFORD (U.) A large proportion of the cases here "were undoubtedly due to the facility existing for the escape of sewer gas, owing to the faulty condition of the water-closets connected with nearly the whole of the cottage property in the town."



SOUTHEND. "The offer of the Health Committee, to have the throat products examined bacteriologically has not received much support, as in only 11 cases have the products been submitted, the Loeffler bacillus being found in 7. It must be understood that the want of identification of the bacillus in no wise points to an inaccurate diagnosis, as it is somewhat difficult to differentiate from other organisms."

SAFFRON WALDEN (U.) The Medical Officer of Health says:—"So little is known of the origin of Diphtheria that it is quite impossible to trace the cause of each case, but I may mention in connection with the 5 cases which occurred in October and November, that there had been a marked family predisposition to throat illness, and that I found on the premises a development of the same white fungoid growth of low type which I have noticed in connection with some other outbreaks of this disease."

WALTHAMSTOW. "That similar clinical conditions are not diagnosed as Diphtheria by the different medical men in your District is evident from the fact that 20 cases were notified as Diphtheria by one medical practitioner in July and August, out of a total of 47 occurring in the whole district. I pointed out to your Sanitary Committee that there is no excuse for errors of diagnosis in this disease, and, as in the case of Typhoid Fever, arrangements were made with Dr. Thresh to furnish a Bacteriological Diagnosis to any medical practitioner in your district who wished to avail himself of the opportunities offered. Culture outfits are kept at the Town Hall, and notice has been sent to the doctors to that effect." "It would be wise to allow no child, who has suffered from Diphtheria, to return to school until a certificate was obtained that bacteriological investigation failed to detect either true or involution forms of the diphtheria bacillus." The good results obtained at the Metropolitan Hospitals from the use of Anti-toxin leads the Medical Officer of Health to suggest that it would be a step in the right direction were a supply of the serum kept at the sanitary offices, and, if possible, gratuitously supplied.

WALTHAM HOLY CROSS. There has been no epidemic, but sporadic cases occurred throughout the year. A bacteriological examination was made of doubtful cases.

The Medical Officer of Health gives a table from details furnished by two colleagues as to the result of treatment with Anti-toxin. The mortality prior to 1897 was about 50 per cent. whereas in 1898 it was only 14·3 per cent. (so high a mortality as 47·4 per cent. is exceptional, whereas a mortality of 14·3 per cent. without the serum treatment is not at all uncommon. J.C.T.)

BRAINTREE (R.) A considerable number of cases were notified in this district, but the Medical Officer of Health doubts whether half of them were true Diphtheria. The mortality rate however was not much under the average.

DUNMOW. An outbreak occurred at Great Easton and another at White Roothing. In both instances the cottages stood on very damp soil.

EPPING (R.) Twice as many cases occurred as in the previous year. This increase was due to an outbreak at Thornwood Common. The drainage and other conditions were very insanitary.

ONGAR. An outbreak occurred among the children attending the Trust School at Chipping Ongar, probably due to a leaky disused drain under the school room.

ROCHFORD. Certain cases turned out to be simply severe sore throat and not true Diphtheria. Three cases "were evidently caused by the drinking of impure water from a pond which received drainage."

ROMFORD (R.) Most of the cases were associated with a local sewage nuisance at Dagenham, the old condition so often reported; in Corbets Tey cases were due to a local nuisance, subsequently remedied.

TENDRING. "In the Ardleigh sub-district there were 11 cases, all in the last quarter, they were probably caused by want of drainage and the distribution of London manure on the fields adjoining the houses."



## TYPHOID—CONTINUED—AND PUERPERAL FEVERS.

TABLE XV.

Case-rate and Death-rate per 1,000 Population.

	1898.		1897.		Mean for 7 years. 1890-6.	
	Case- rate.	Death- rate.	Case- rate.	Death- rate.	Case- rate.	Death- rate.
Rural Districts ... ..	1·01	·17	·90	·12	·79	·14
Urban Districts ... ..	1·27	·20	1·33	·22	1·25	·19
Administrative County ...	1·18	·19	1·17	·19	1·12	·174
England and Wales ...	—	—	—	·16	—	·18

The prevalence of "Fevers" shews no sign of decreasing, and the distribution is much the same as in previous years (*Vide* page 25. Report, 1897).

## PUERPERAL FEVER.

Only 30 cases were notified during the year, with 17 deaths, against 48 cases with 21 deaths in the preceding year. As it is now generally believed that this Fever is entirely preventible we may hope to considerably reduce this mortality. As there were just over 20,000 births in the county, the mortality per 1,000 births is only ·85. "The starting point of our present estimate of the nature of puerperal septic disease was the well known, but at the time little appreciated work of Senimilweiss, who, in 1847, was the first to show clearly that puerperal septic disease was directly conveyed to the patient by hands, sponges and the like, defiled by decomposing animal matter; and was the first to point out the influence of cleanliness

and antisepsis. . . . . After years of calumny and neglect these epoch making observations are now estimated at their proper value " (N. S. Playfair, in Allbutts system of Medicine). Many of the cases which now occur in private practice are attributed to insanitary conditions in the homes of the patients rather than to any want of care on the part of the medical attendant or midwife, but a few cases are recorded in which want of proper precautions on the part of the midwife is regarded as the cause of the disease. The old order of midwives is passing away and specially trained women taking their place and with the best results.

#### CONTINUED FEVER.

From time to time it has been pointed out that this name does not indicate any specific disease and that with increased skill and care in diagnosis the number of cases of so called "continued" fever will decrease. In the Rural Districts only one such case was notified. In the Urban Districts there were 11 cases and it is noteworthy that 8 of these occurred in Leyton. The Medical Officer of Health however makes no special reference thereto.



## TYPHOID AND CONTINUED AND PUERPERAL FEVERS.

TABLE XVI.

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 ...	33	2	1	1	Belchamp ...	2	0	0	0
Braintree ...	3	0	0	0	Billericay ...	29	7	0*	1
Brightlingsea ...	3	0	0	0	Braintree ...	11	0	1	1
Buckhurst Hill ...	18	0	0	0	Bumpstead ...	1	0	0	0
Burnham ...	3	1	0	0	Chelmsford ...	19	3	2	0
Clacton ...	2	1	0	0	Dunmow ...	6	0	0	0
Chemsford ...	9	1	0	0	Epping ...	11	5	1	1
Chingford ...	3	1	0	0	Halstead, 1 ...	0	0	0	0
Colchester ...	20	8	2	2	Halstead, 2 ...	1	0	0	0
East Ham ...	78	10	4	1	Lexton and Winstree ...	9	2	1	1
Epping ...	0	0	0	0	Maldon ...	16	4	2	0
Grays ...	17	1	2	1	Ongar ...	3	1	1	0
Halstead ...	3	0	0	0	Orsett ...	41	5	0	0
Harwich ...	10	3	0	0	Rochford ...	39	6	0*	1
Ilford ...	33	3	0	0	Romford ...	37	6	0	0
Leigh-on-Sea ...	21	3	0	0	Saffron Walden ...	2	0	0	0
Leyton ...	89	16	7	3	Stanstead ...	2	0	0	0
Maldon ...	4	0	1	0	Tendring ...	25	2	0	0
Romford ...	18	4	0	0					
Saffron Walden ...	0	0	0	0					
Shoeburyness ...	33	2	0	0					
Southend-on-Sea ...	105	16	1	1					
Waltham Holy Cross ...	2	1	0	0					
Walthamstow ...	76	9	3	3					
Wanstead ...	3	1	1	0					
Walton-on-the-Naze ...	0	0	0	0					
Witham ...	2	0	0	0					
Woodford ...	9	1	0	0					
Wyvenhoe ...	3	0	0	0					
	600	84	22	12		254	41	8	5

\* No case notified.

**BARKING.** Thirty-one cases occurred here, of which 17 were associated with defective drains, one with the eating of shell-fish, one with the cleansing of a ditch, and in 12 no cause could be discovered.

**BUCKHURST HILL.** A localised epidemic occurred here in September, which necessitated a temporary hospital being used for isolation. Thirteen cases occurred in all. The cause could not be definitely ascertained. It was obviously one very local in its action and limited to a few days.

HARWICH. Five cases occurred in one house, and were attributable to defective drainage.

LEIGH, SOUTHEND, SHOEBURYNESSE, AND ROCHFORD (R.)  
As usual, a larger proportion of cases occurred in this corner of the county than in any other part. As each of these Urban Districts has a different water supply, it is very improbable that water is the cause. In Southend the distribution was very different to that of previous years. In St. John's district there was a considerable decrease, fairly ascribed to the new sewerage system, which prevents the periodical flooding of houses which previously occurred. An outbreak of seven cases occurred amongst people using water from a polluted well. The Medical Officer of Health ascribes the cause of the endemic prevalence and seasonal development to sustained befoulment of the soil. Recent researches on the life-history of the Typhoid bacillus shews that this organism can live and flourish in a polluted soil for a considerable period. In Southend 12 of the persons attacked had eaten shell-fish—oysters 4, cockles 6, mussels and cockles 1, mussels 1—within a month from the date of notification. Of course it does not follow that the eating of the shell-fish was the cause of the disease. In the Rochford Rural District most of the cases occurred in Great Wakering. Some appear to have been due to the use of sewage contaminated well water.

LEYTON. The following causes have been assigned to the cases that occurred in this district:—

Imported	...	...	18	Falling into Stagnant	
Defective Drainage	...	...	38	Water	...
Drinking Pond Water			1	Drinking Water at S—	1
Eating Ice-cream	..		1	Eating Oysters	...
Untraceable	...	...	24		

WALTHAMSTOW. The 76 cases occurred in 67 houses, and in 24 of these sanitary defects, chiefly of drainage, were found. The distribution of the cases was evidence that the disease was not water-borne.



BILLERICAY (R.) The Medical Officer of Health says :—  
 “I am strongly of opinion that the long-continued dry weather was the cause of sporadic outbreaks; that many traps became dry, and in this way allowed sewer gas to escape.” Cases occurred in houses with other sanitary defects.

CHELMSFORD (R.) Six cases occurred in one house, five being apparently infected from the first case. In several instances the patients had been infected outside the district. One was attributed to smells from a sewage farm, one from carting manure, and one from cleansing a cesspool.

EPHING (R.) Three cases of a virulent type, resulting in two deaths, occurred at North Weald. The first case was imported and occurred in an over-crowded cottage. Unfortunately it could not be removed to Hospital, consequently two other members of the same family became infected.

MALDON (R.) Of the 16 cases which occurred here five were undoubtedly imported, and with reference to three there is some doubt as to the diagnosis. One only was a secondary case. Of the remaining seven, two had been recently exposed to the effluvia from London manure, one had been working amongst manurial filth, two resided in cottages with ditch nuisances near, one resided in a house deriving water from a polluted well, and one could not be associated with any insanitary conditions.

ORSETT (R.) Twenty-five of the cases at Tilbury Docks, a continuation of the 1897 epidemic. Eight cases occurred at West Thurrock in one house supplied with water from a polluted well.

ROMFORD (R.) Twenty-three out of the 35 cases notified occurred in Dagenham and Beacontree Heath, where local nuisances from sewage abound.

TENDRING. In July there was a considerable outbreak at Manningtree, due apparently to want of proper drainage. In other cases the cause is ascribed to insanitary conditions.

## DIARRHŒA.

Diarrhœa is included by the Registrar-General in the group of the seven principal zymotic diseases. There is, however, such diversity of opinion and of practice that it is doubtful whether all our zymotic death-rates are not rendered useless by the inclusion of this disease. Quite recently the Home Counties' Branch of the Medical Officers of Health Society has been investigating this subject, and sent out letters of enquiry to all the Fellows of the Society. With this letter was enclosed a list of causes of death, and each Fellow was requested to erase those which he did not classify under Diarrhœa. This list comprised Simple, Acute, Chronic, Summer, Epidemic, Choleraic and Dysenteric Diarrhœa, English and Infantile Cholera, Cholera Nostras, Dysentery, Intestinals and Gastro-intestinal Catarrh, etc., and Diarrhœa, coupled with other causes of death. The replies shewed that there were at least 165 different ways in which these causes were classified as regards Diarrhœa, and the Committee reported: "We are forced to the conclusion that such classification is at the present time in such a state of utter and hopeless confusion as to render the statistics of Diarrhœa deaths, and consequently of Zymotic death-rates, in different localities misleading and altogether useless for comparison."

The form of Diarrhœa which is regarded as Zymotic is a specific disease, as truly as is Typhoid Fever or Cholera. This was conclusively proved by the researches of the late Dr. Ballard, F.R.S., in 1888. This form of Diarrhœa alone should be included in the returns of deaths from Zymotic Diseases. Unfortunately the death certificate, upon which the Medical Officer of Health must base his statistics, rarely indicates whether the death was due to the Zymotic form of the disease or to some other disease in which the Diarrhœa was the most prominent symptom. If some specific name was given to the disease, no doubt, in time, medical men would employ it. At present I can only suggest that it should be distinguished as



Epidemic or Zymotic Diarrhœa. The whole subject is undergoing further investigation, and the Medical Officers of Health Society has requested the Royal College of Physicians to assist them in their deliberations. Meanwhile medical men would render a great service to public health if they would adopt my suggestion and use the word Epidemic or Zymotic to distinguish this particular disease from all others.

This lack of uniformity has caused several Medical Officers of Health to exclude Diarrhœa deaths entirely from their Zymotic statistics. Such a procedure only increases our confusion.

During the past year the deaths from Diarrhœa have been unusually numerous, and in many districts there were widespread epidemics in the autumn. In the Urban Districts 660 deaths were recorded, and in the Rural Districts 151, against 539 and 109 respectively in the previous year. The rates per 1,000 population are as under :—

	1898.		1897.		Mean for 7 years, 1890-6.
Urban Districts ...	1·35	..	1·21	...	·62
Rural „ ...	·59	...	·42	...	·36
County .. ...	·95	...	·93	...	·51
England and Wales	—	...	·86	...	·61

It is noteworthy that for two successive years the mortality from Diarrhœa has been very excessive. In fact the deaths from this cause have exceeded those from all other Zymotic Diseases put together. The subject is of such great importance that I venture to include in this report a special report by the Medical Officer to the Barking Urban District Council, on the prevalence of Diarrhœa in that town.

THE CHAIRMAN AND MEMBERS OF THE BARKING TOWN  
URBAN DISTRICT COUNCIL.

Gentlemen,

INFANTILE DIARRHŒA.

With a view to discover, if possible, what causes were at work to produce such a large number of fatal cases of

Diarrhoea as were registered during the third quarter of 1898 in the Barking Urban District, the following enquiries have been made in every case :—

Age,  
No. in family,  
No. of rooms in house.

Nature of food up to the age of one year :

Nursed by Mother ?  
Was Condensed Milk used for Feeding ?  
Was Cow's Milk used ?  
Were other Foods used and what ?

Nature of the Premises :

Is the Site of the House Concreted ?  
Are the Backyards Paved ?  
Are there any Sanitary Defects ?  
Does the Mother go out to work ?  
If so, state the nature of the work ?

The result of these enquiries was as follows :

Overcrowding, 13 out of 61.

Note—6 persons in 4-roomed house I have not counted overcrowding, but over that I have put in the list on that head.

Nursed by Mother, 10 out of 61, or 16·3 per cent., as against 16·8 per cent. in 1897.

Condensed Milk used in 39 cases.

Cows	„	„	14	„
Other Foods	„	„	30	„
Mixed	„	„	22	„

Sanitary defects were noted in 19 cases.

Only in three cases did I find any history of the mothers going out to work in factories or elsewhere. The site of the house was not concreted in any of the cases, and the backyards were paved in 55 cases out of the 61.

These figures, I think, demonstrate very clearly that overcrowding, gross sanitary defects in the dwellings, and neglect, by the reason of the mother being employed in factories, etc., are not the direct cause in many of the cases.



As in the past year hand-fed children, which form 83·7 per cent. of the cases investigated, suffered very severely. It seemed to me, in seeking for the true origin of the epidemic, that the best method would be to divide the causes thereof into direct and indirect. Many, if not all of the former, I have already indicated. As to the latter, the following may be enumerated in addition to any items given above which may fall under this head (*a*) *impurity of the subsoil* as evidenced by analysis of water taken therefrom which contains nitrites and chlorides in abundance, and in some samples, large quantities of free ammonia; (*b*) *the polluted state of the atmosphere* aggravated in the summer months by the decomposition of organic matter in all parts of the district (due largely to sewage deposits). Under this head I include the late pollution of the Loxford Brook and the River Roding, by our Ilford neighbour, the condition of the Roding being rendered more foul by the gross pollutions of other Authorities as far up as the village of Abridge (see reports River Roding, by myself and County Medical Officer); (*c*) many of the children are weak and sickly from birth.

These indirect factors in the lowering of the general health, especially the infantile health of the district, are now receiving a good deal of attention from the local Council. Private drains, wherever possible, are examined, and when found leaky or unventilated, are relaid and air shafts attached. The sites of all new houses are protected with a layer of concrete, and overcrowding as far as possible is dealt with. In spite of all these precautions the number of cases remains about the same, the death rate in 1897 being 2·7, the death rate in 1898, 2·65 per annum of the estimated population respectively.

I have no doubt that when once infants are attacked by this disease, the only effectual remedy is change of environment, and I trust that should this town be threatened by an epidemic as severe as those by which it has been visited during the past two years, that some means may be found to remove

the sufferers from their unhealthy surroundings and thus endeavour to mitigate this infantile scourge.

In order to carry out this recommendation effectually, I think a site should be temporarily hired in some locality at a greater elevation above sea level than obtained at Barking, and the children housed in wooden huts, or possibly tents, as these cases only occur in the height of summer.

The financial aspect of the case presents the greatest difficulty, but possibly the generous public may provide or help to provide the necessary funds.

I also recommend that handbills, stating the precautions to be taken in the rearing of hand-fed children, be widely circulated in the District.

I am, Gentlemen,

Your obedient servant,

C. F. FENTON,

January, 1899.

*Medical Officer of Health.*

CHELMSFORD U. Diarrhœa was very prevalent in the autumn, causing 13 deaths. "The mortality amongst infants attacked is usually very high, this is most marked in children who have been brought up by hand, and in cases occurring in damp, overcrowded, and badly-ventilated houses."

EAST HAM. The Medical Officer of Health says: "In this district a hot, dry summer, with a continuous high temperature, seems to me to be the most potent cause; this, together with improper feeding and natural neglect, is accountable for the high mortality. To prevent the recurrence of this great mortality among infants, I should advise the frequent flushing of sewers and the ventilation of them; the earth beneath the houses should be covered by an impervious stratum of cement, so as to prevent ground air ascending into them. Strict supervision should be given to the food supply, especially milk, and frequent samples taken for analysis."



LEYTON. An epidemic commenced rather suddenly in August, when 60 deaths occurred, and was continued through September, causing 57 other deaths. During August printed leaflets were distributed throughout the district, warning parents against the danger of allowing this complaint to continue without seeking advice and suggesting the care to be taken with milk and water during the extreme heat.

WALTHAMSTOW. The Medical Officer of Health refers fully to the subject of Diarrhœal mortality. It caused 41 more deaths than all the other Zymotic Diseases. A special enquiry was made, resulting in the conclusion, that milk is the most important factor in the production of the disease, since 87 per cent. of the fatal cases occurred in hand-fed children. Cleanliness and the sterilization of milk are the remedies advocated, the Medical Officer of Health concluding his report by saying, "I feel sure by a little extra care and trouble, and a little common sense exercised in the management of babies, the sickness and mortality rate of Diarrhœa might easily be reduced."

In the Rural Districts the mortality from Diarrhœa is relatively low, but in certain localities there was evidently unusual prevalence during the autumn. The subject, however, is rarely mentioned. In the Epping Rural District the Medical Officer of Health says, "Diarrhœa and Dysentery caused rather a larger number of deaths than in the previous year, and there was, during the late autumn a prevalence of what is known as Summer Diarrhœa, especially amongst infants, but this appeared to be due more to the unusual heat than to any local or insanitary conditions."

ORSETT R. Twenty-one deaths occurred, and much the greater number were of bottle-fed infants. There can be no doubt from the enquiries made in this county and elsewhere that the mortality from Zymotic Diseases is almost entirely preventible.

*Note by County Medical Officer of Health.*—Something may be done by the Sanitary Authorities in securing purity of air, water and soil, in supervising more strictly the milk supply, etc., but more must

be done by educating the people, and more especially the working classes. Remarkable results have been obtained in certain French towns by philanthropic societies providing the poor with sterilized milk in sterilized feeding bottles. A charge is made which covers the cost of the milk, etc., but the cost of providing a centre, apparatus, etc., is borne by the societies. Establishments of this kind in some of our large centres of population would, I am sure, result in the saving of many lives, and I commend the proposal to those having the leisure and inclination to consider the matter. I have a mass of information with reference to these societies, which I should be glad to place at the disposal of anyone caring to investigate.

#### MEASLES AND WHOOPING COUGH.

**TABLE XVII.**

	Measles.			Whooping Cough.		
	1898	1897	Mean for 7 years, 1890-6.	1898	1897	Mean for 7 years, 1890-6.
Rural Districts ... ..	·21	·03	·16	·18	·33	·29
Urban Districts ... ..	·39	·23	·39	·32	·34	·41
County ... ..	·32	·16	·31	·27	·33	·37
England and Wales ... ..		·40	·41		·35	·39

Epidemics of Measles have been very common during the year, especially in the Rural Districts. Whooping Cough very often follows in the wake of Measles, and then greatly increases the mortality.

Both Measles and Whooping Cough are notified in Colchester. During the year 415 cases of Measles were notified, and 592 cases of Whooping Cough. The former caused 16 and the latter 33 deaths. The mortality per 100 cases is in both instances very high, being 3·85 and 5·5 respectively. In Ilford 425 cases of Measles were notified, with only 5 deaths, or a mortality of 1·17 per cent. The type of the disease, therefore, was much more severe in Colchester than in Ilford.



At Barking a smart epidemic occurred at Rippleside, and 40 cases were reported by the School Board. Circulars, giving instructions with reference to the prevention of the disease, were distributed, children from infected families excluded from the School, etc., and the epidemic soon came to an end. In most districts, however, where the disease occurred the public elementary schools had to be closed for a period.

#### ISOLATION HOSPITALS AND THE EXTENT TO WHICH THEY ARE UTILIZED.

In the undermentioned districts the Isolation Hospitals may be regarded as being of a satisfactory character, and fairly adequate for the requirements of the respective districts.

Halstead (U.).

Harwich.

Ilford. This was only completed towards the end of the year.

Saffron Walden (Urban and Rural Joint Hospital).

Southend. The Medical Officer of Health recommends certain additions necessitated by the rapid growth of the borough.

Grays Urban and Orsett Rural. The Hospital belongs to the Orsett Rural District Council.

Stanstead. This Hospital has been enlarged and improved during the year.

In the following districts the Hospitals are not altogether sufficient for the requirements of the districts served :—

Barking. The Medical Officer of Health says many additions are urgently needed, but urges that some permanent scheme should be adopted.

Colchester. This Hospital has been much improved during the year, an additional ward being rendered available.

Leyton. A fire occurred in the Laundry Block. This has now been re-built in brick, and is a substantial building. The electric light is about to be installed, and will diminish the risk of fire.

Wanstead. This Hospital is also used by Woodford, but it is too small for both. During the year the accommodation had to be supplemented by the erection of a tent.

Billericay, R. A caretaker's cottage is wanted.

Epping, R. Considerable improvements are being effected here, but are not yet completed.

Halstead, R. No 1 division sends patients to Halstead, U. In No. 2 there is a Cottage Hospital.

In the following Districts, without Hospitals, arrangements are made with some other district possessing a Hospital. In no case is this arrangement satisfactory :—

Buckhurst Hill	}	All send patients to the Epping Rural District Hospital.
Chingford		
Epping, U.		

Woodford sends patients to the Wanstead Hospital.

Shoeburyness sends patients to the Rochford Hospital.

In the above districts nearly 40 per cent. of the patients suffering from Scarlet Fever, Diphtheria, and Typhoid Fever were removed to Hospital. The following table gives the number of cases notified and the number removed in each of the districts. In many districts as many as 60 per cent. of the cases notified were removed; the smallest per centage of removals was in the Saffron Walden Rural District. Last year 15 per cent. of the cases were removed in this district.



District.	No. of cases of Scarlet Fever, Croup, Diphtheria, and Typhoid Fever notified.		No. of cases removed to Hospital.		Cases removed, per cent.
<i>Urban—</i>					
Barking	..	176	...	109	62
Buckhurst Hill		27	...	17	63
Colchester	...	146	...	32	22
East Ham	...	872	...	283	32
Grays	...	78	...	21	27
Halstead	...	14	..	9	64
Harwich	...	24	...	15	62
Leyton	...	616	...	187	30
Saffron Walden		14	...	9	64
Southend	...	250	..	154	61
Wanstead	...	82	...	30	36
Woodford	...	63	...	32	50
		2,362		902	38
<i>Rural—</i>					
Billericay	...	75	...	30	40
Chelmsford	...	82	...	37	45
Epping	...	70	...	29	41
Halstead I.	...	26	..	6	23
Halstead II.	...	11	...	6	54
Orsett	...	98	...	23	23
Saffron Walden		37	...	2	5
Stanstead	...	24	...	14	58
		423		147	36

In the following districts Hospitals are in course of construction :—

Braintree Urban and Rural Joint Hospital.  
Romford Urban and Rural Joint Hospital.  
Walthamstow.

In the following districts plans for Hospitals have been submitted to the Local Government Board :—

Maldon Rural, with which Burnham will probably arrange.

Dunmow Rural.

Rochford Rural and Shoeburyness.

In the undermentioned districts the Hospitals are too small, or of a temporary character : —

East Ham. The Council are negotiating for a site for a permanent Hospital.

Chelmsford, U. Merely a pair of cottages, totally unfitted for the purpose.

Lexden and Winstree. A tent Hospital only.

Tendring. A tent Hospital.

Maldon, R. A tent Hospital. Providing two permanent Hospitals.

Clacton. A tent Hospital only.

In the above districts naturally only a small proportion of the cases of infectious disease can be isolated, as is well shewn in the following table :—

	No. of cases notified.		No. removed.		Per cent.
East Ham ...	872	...	283	...	32
Chelmsford, U.	30	...	8	...	26
Lexden and Winstree	53	...	0	.	0
Tendring ...	50	...	8	...	16
Maldon ...	46	...	0	...	0
Clacton ...	30	...	4	...	13

In the following districts no Hospital accommodation of any kind is provided : Brightlingsea, Leigh, Witham, Walton, Wyvenhoe, Belchamp, Bumpstead, Ongar, Waltham Holy Cross. In the latter district there is a small wooden building, but the Medical Officer of Health says, "it is obsolete for all practical purposes."



METEOROLOGICAL DATA AND THE PREVALENCE OF  
ZYMOTIC DISEASES.

The year under consideration will for long be memorable on account of the exceedingly low rainfall. The weather generally was of an unusual character. The mean temperature for the year was above the average, and the summer months were notable for their excessive dryness, the large amount of sunshine and continued high temperature.

RAINFALL. In all the districts from which records are received the rainfall was much below the average, and the effect upon the yield by springs and ponds was very marked. Unfortunately the maximum effect upon the springs will not be felt until the coming summer, and there can be no doubt that many towns and villages depending upon springs for their supply of water will suffer great inconvenience. The rainfall during September was exceedingly small, varying from .17in. in Chelmsford to .38 in Walthamstow. The total rainfall varied from 15.76in. in Southend to 21.19in. in Saffron Walden, and 21.10 in Walthamstow. It is noteworthy that both these localities have an average rainfall some inches higher than at Chelmsford, Southend, and Waltham Cross.

	Average rainfall.		Rainfall, 1898.		Per cent. below average.
Saffron Walden	24.61	...	21.19	...	14
Chelmsford ...	22.24	...	16.65	...	25
Southend ...	20.54	...	15.76	...	23
Waltham Cross	21.57 (?)	...	16.48	...	23.5
Walthamstow...	25.5 (?)	...	21.01	..	18
Billericay ...	24.0 (?)	...	17.51	...	27

With reference to the effect of rainfall on disease, the Medical Officer of Health for Waltham Cross remarks that "the incidence of Summer Diarrhoea was felt somewhat later in the year than usual, and did not reach its height until the end of September and commencement of October, when the rains began, and, as is usual when the superficial layers of the earth have been raised to an abnormal temperature, was slow to decline."

## MONTHLY RAINFALL DURING 1898, IN INCHES.

			Saffron	Chelms-		Waltham	
			Walden.	ford.	Southend.	Holy Cross.	Waltham-stow.
January	...	...	·74	·74	·50	·72	·98
February	...	...	·73	·80	·83	·84	1·25
March	..	...	1·85	1·38	2·09	1·07	1·30
April	...	...	1·81	1·15	1·22	1·30	1·39
May	...	...	3·13	1·90	2·62	1·77	2·08
June	...	...	2·84	2·21	1·20	1·48	1·60
July	...	...	1·06	·64	·65	1·05	·94
August	...	...	1·38	·86	·82	1·28	1·12
September...	...	...	·21	·29	·17	·34	·38
October	...	...	2·66	2·32	1·67	3·26	4 04
November...	...	...	1·83	2·02	2·19	1·31	2·49
December	...	...	2·95	2·30	1·80	2·06	3·44
			-----	-----	-----	-----	-----
			21·19	16·61	15·76	16·48	21·01
1897	...	...	23·49	21·79	21·23	23·33	24·4 <sub>3</sub>
1896	...	...	26·66	24·10	21·74	26·41	24·95
1895	...	...	23·21	18·92	19·38	20·06	20·98
			25 years.	9 years.	10 years.		
Average	...	...	24·61	22·24	20·54	...	25·5?

Table XVII. contains the monthly records of the observations taken at the Royal Meteorological Society's Station at Chelmsford, under my charge, together with the monthly returns of the cases of Infectious Diseases notified throughout the county.



TABLE XVIII.

METEOROLOGICAL DATA AND PREVALENCE OF INFECTIOUS DISEASES,  
For the Year ending December, 31st, 1898.

	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 Fevers.	Erysipelas.	
January...	41.7	10.7	92.	9	.74	0	94	45	178	69	386
February...	38.45	8.95	87.5	9	.80	1	105	43	165	38	352
March...	39.05	15.1	86.	11	1.38	0	125	36	183	65	409
April...	46.50	18.9	78.	10	1.15	1	101	29	173	51	355
May...	50.4	16.2	80.5	20	1.90	0	70	32	161	68	331
June...	56.2	17.9	82.	13	2.21	2	85	27	162	56	332
July...	59.7	21.0	77.	6	.64	0	121	65	161	44	391
August...	63.37	21.85	75.	8	.86	0	108	62	151	33	354
September...	60.0	25.14	69.5	3	.29	0	133	115	147	37	432
October...	53.05	13.5	84.	14	2.32	0	144	176	305	61	686
November...	44.66	13.26	94.	18	2.03	0	140	167	287	74	668
December...	43.95	12.5	87.	12	2.30	0	159	59	259	82	559
Means and Totals...	49.75	16.25	82.7	133	16.65	4	1385	856	2332	678	5255

### SECTION III.

#### SANITARY ADMINISTRATION.

##### *Housing of the Working Classes.*

Section 45 of the Housing of the Working Classes appears in this County to be entirely ignored. It confers considerable power upon the County Council, and there are reasons for believing that the power might be exercised with beneficial effect in certain districts. The Section says :—

“Where the Medical Officer of Health or any inhabitant householders make a representation or complaint, or give information ... .. to any Rural Sanitary Authority ... .. or to the Medical Officer of such Authority either respecting any dwelling house being in a state so dangerous or injurious to health as to be unfit for human habitation, or respecting an obstructive building, and also where a closing order has been made as respects any dwelling house, *the District Authority shall forthwith forward to the County Council of the County in which the dwelling house or building is situate, a copy of such representation, complaint, information or closing order, and shall from time to time report to the Council such particulars as the Council require respecting any proceedings taken by the Authority with reference to such representation, complaint, information or dwelling house.*”

Where the County Council are of opinion that the District Council is not doing its duty, then after reasonable notice, etc., the County Council becomes vested with all the power of the District Council, and can take such proceedings as may be necessary for obtaining a closing order or an order for demolition. The County Council and their officers have the same right of admission to any premises as any District Council or their officers.



From the Reports of the Medical Officer of Health many houses have been represented as being unfit for human habitation, but as far as I am aware not a single copy of such representation has been sent to the County Council.

Under Section 52, a representation from the Medical Officer of Health of any County submitted to the County Council, and forwarded by that Council to the Local Authority (not being a borough) shall have the like effect as a representation from the Medical Officer of Health of the District.

Doubtless this is a subject which will receive the serious consideration of the Sanitary Committee of an early date.

**BARKING.** Several schemes have been before the Council during the year, and it has been decided to erect a number of cottages. The plans have been approved by the Surveyor to the Local Government Board, and the Council have requested permission to undertake the erection themselves. It is hoped that by this action a four-roomed cottage will be provided at a rent of about 6s. or 6s. 6d. per week inclusive, and an excellent site has been purchased, at a reasonable cost, on the Ripple Road. The Medical Officer of Health is of opinion "that it would be a great boon to the town if more double tenement houses, having separate front and back entrances, and separate back yards, were erected." By this means, he thinks that the average size of living and sleeping rooms could be increased, without adding proportionately to the rental.

**EPPING (U.)** The defective housing of the working classes referred to in previous annual reports continues to give much trouble, and in the event of an outbreak of infectious disease has a prejudicial influence. "It does not appear that this difficulty is likely to be met by private enterprise, and therefore it becomes a question whether your Council should not seriously consider the question of providing cottages under the powers of the Housing of the Working Classes Act, as has been done successfully at Richmond and other places."

**SOUTHEND.** The Corporation have adopted Part III. of the Housing of the Working Classes Act, which enables them to provide cottages for the labouring classes.

**WALTHAM HOLY CROSS.** In connection with the insanitary area referred to in last year's report, the scheme for clearing and re-building is being proceeded with. Ten houses have been erected, but difficulties have arisen in connection with the purchase of certain properties, and this has delayed the completion of the works.

**STANSTED.** The Medical Officer of Health's report on each village in this district show that many cottages are not very satisfactory, the floors often being of brick laid on clay, causing them to be cold and damp.

The numbers of houses closed as being unfit for human habitation, and the number placed in habitable repair in each district, from which a return has been secured, are given in Tables supplied by the Sanitary Inspectors.

#### WATER SUPPLIES.

This is a subject of vital importance to the continued prosperity of this County, and it is certainly not receiving the attention it deserves. The population is increasing very rapidly, and the water available is very limited in quantity. Before a recent Parliamentary Committee it was stated by eminent authorities that the problem of the future water supply of the County, more especially the southern portion, was one of the most difficult with which they had had to contend. It affects so many different authorities that the County Council would do well to give the subject special attention. The following Table gives the population of certain district in 1891, the estimated population in 1898, and the estimated population for 1930, assuming the same rate of increase :—



		1891.	Population 1898.	1930.
<i>Urban Districts</i>				
Shoeburyness	...	2,290	4,128	
Southend	...	13,242	22,583	
Leigh	...	2,108	3,750	
Grays	...	12,217	14,750	
Brentwood	...	4,949	5,175	
Romford	...	8,408	10,500	
Barking	...	14,301	20,000	
Ilford	...	10,913	27,178	
<i>Rural Districts—</i>				
Rochford	...	11,544	14,524	
Orsett	...	14,378	16,774	
Billericay	...	15,624	15,624	
Romford	...	16,042	18,560	
		<hr/>	<hr/>	<hr/>
		126,016	173,546	710,050
		<hr/>	<hr/>	<hr/>

At the present time the amount of water required is about 5 million gallons per day, allowing 30 gallons per head, in 1930 it will be over 20 million gallons.

Difficulty is already experienced in obtaining this 5 millions, what therefore will be the difficulty of obtaining four times this amount? There are only two available sources, the water shed of the Roding, and the deep wells in the Chalk or in the overlying sands. The whole of the land in the upper portion of the Roding Valley is under cultivation, and the water above Ongar shows a serious amount of pollution, doubtless chiefly due to manurial matter, but also due in part to sewage. It is a source which could only be utilized as a last resource, and the water would have to be collected in very large reservoirs during the winter, since the flow is practically *nil* in a dry season. Possibly by adopting the most modern and efficient systems of purification the water could be rendered safe for domestic purposes. "The River rises a little to the west of Dunmow, close to some of the sources of the Stort, and has at first a

course to the south through a narrow valley, receiving only a few small rills from exceedingly short lateral valleys. It runs in this way nearly 10 miles, when its drainage area expands and tributaries come in. The stream now turns to the west for a mile, and then recovering its direction passes Ongar, where it is joined by the Crispey Brook," from the north-west, this stream having run six miles in an easterly direction from near Epping. Receiving a few small feeders, the Roding now follows a winding course to the south-west for five miles, fed chiefly from the west, and then continues in a tortuous course for about six miles to Loughton. After this it runs through many small towns and villages. (Ansted.) The total drainage area of the river is 317 square miles. Assuming that half this area could be placed under contribution, and a minimum of 4 inches of rainfall collected annually, the river would yield a supply, if properly conserved, of 23 million gallons per day.

The possibility of this river having at some future time to be utilized for supplying water for domestic purposes, should cause a careful watch to be kept in order to have removed as many of the sources of pollution as possible.

The deep Chalk (and Thanet Sand) is the only other source from which water can be obtained in any quantity. In the south of the County it is probable that only a very limited amount of water can be obtained from it. It is, however, possible that further north, towards Dunmow, a large quantity of water can be obtained, although it would be very hard. Towards Coggeshall the Chalk water becomes much softer, and at Kelvedon it contains still less lime salts. As this subject is receiving much of my attention, I venture to reproduce here a portion of a paper recently contributed by me to the British Association of Water Works Engineers, since it bears directly on the question under consideration.

"The Chalk underlies all portions of Essex, and save at the north-west and in the south this Chalk is overlaid with London Clay and other Tertiary deposits, often of great thickness. Table I. shows that in all parts of the County, save near the



outcrop of the Chalk, the water contains no lime or magnesia salts, except the carbonates, and is rich in carbonate, sulphate, and chloride of sodium. Most of them are exceedingly soft, but there is much variation. They all contain much less carbonate of calcium (chalk) than waters taken from the Chalk elsewhere. It is noteworthy, also, that throughout this portion of the County the Thanet Sands yield waters of exactly the same character. The analysis of a typical sample taken from a well recently bored at Laindon Hill is given for comparison. I have analyses of many such waters. None of these wells yield any large quantity of water. I doubt whether any one is capable of giving half a million gallons per day. In most cases the water-level is easily reduced, and takes a long time to recover, indicating that the Chalk is very compact and does not transmit water freely. The curious character of this water has given rise to much discussion. What is the source of the carbonate, sulphate, and chloride of sodium? And what has reduced the hardness of the water or removed so much of the calcium and magnesium salts which we find in all other Chalk waters? My view is that this water is practically stagnant under certain portions of the county, and that in the course of ages the action between the water which entered on the west from the Chalk outcrop and the sea-water which entered on the east from the opposite outcrop under the ocean, has resulted in the formation of these particular constituents. Where these wells are situated near the sea or a tidal river, it is a very easy matter by continuous pumping to introduce sea-water. In fact, on both the south and east, wells have been sunk into the Chalk and abandoned on account of the brackish character of the water obtained; and in other cases wells which at first yielded good water have ultimately become brackish. The normal water-level in these wells is now below Ordnance datum, and is sinking from 1ft. to 2ft. every year. Everything appears to indicate that very little of this water comes from the outcrop to the west, and such being the case, the multiplication of deep wells will continue to reduce the



water-level, and sea-water will travel inland at a rate faster than the reactions which have produced the saline constituents of the water now in the Chalk can keep pace with, and the supply will gradually become brackish. I can discover no indications of this alkaline water travelling in any direction, and in my opinion it is a vast and practically stagnant underground reservoir which, if drawn from, is much more likely to be fed with sea-water from the east than by the rainfall on the outcrop to the west.

Beyond the boundary of the area yielding this alkaline water are to be found a few places in which the water contains no calcium or magnesium salts besides the carbonates, and in which carbonate of sodium is absent (analyses 21 and 22). In other localities (23 and 24) the sulphate of sodium decreases, and sulphate of magnesium makes its appearance. Waters somewhat similar to these are to be found in the Chalk in the Hampshire Basin (25 and 26). I have not found any from the deep Chalk in this basin resembling that from Central Essex in containing carbonate of sodium, but probably such exist.

Analyses 28 and 29 are of waters from wells close to the bank of the Thames, and both undoubtedly containing river water. They are of interest because of the difference in their composition, and because they differ from the water taken from the Chalk outcrop at Grays. The river water entering the Chalk at or near Barking undergoes some change before arriving at the wells, since the deeper wells yield a water containing no calcium sulphate, and in both the proportions of the various salts differ considerably from those in Thames water. At Grays, we find the wells yield no sulphate of magnesia, whilst the common salt and chloride of magnesium, the chief constituents of the tidal water, are increasing. An analysis of a sample of Thames water taken off Grays is given for comparison. If, as is alleged, the water at Grays is impregnated with Thames water, how is it that it contains no magnesium sulphate? It is also alleged that the water in the



Chalk at Grays is chiefly derived from the Kent outcrop. If such is the case, how is it that comparison with the waters of Rochester (68), Gravesend (69), and other places on the opposite side of the river, reveal so little similarity? On the other hand, the Grays water bears still less resemblance to any of the Chalk waters of Essex, save those from Barking Creek, which are admittedly charged with river water. It is a fact, well known to chemists, that salts diffuse or pass through porous strata at different rates. If, for example, I place within a porous earthenware jar a water containing both chloride of magnesium and sulphate of magnesium and surround this jar with pure water, in a given time very much more chloride of magnesium will pass through into the outer water than of the sulphate, and I believe that with a sufficient thickness of chalk, the whole of the sulphate of magnesium could be kept back. This probably is the explanation of the absence of this salt in the Grays water, and also of the fact that, in certain localities in Essex, water is met with containing large quantities of sulphate of magnesia. This may have been derived from sea-water in the manner above indicated. However, these are chemical questions which are now engaging my attention, and upon which at some time I shall have more to say elsewhere.

The two analyses (33 and 34) show how widely Chalk waters vary in the same parish. The Chalk dips rapidly towards the north, and the first sample is from a well at a point where the Chalk surface is 220ft. from the ground surface, whereas the second sample is taken further south, where the Chalk is only 50ft. from the surface. The deeper water contains sulphate of magnesium, but no sulphate of calcium, whereas the shallower water contains the latter salt, but not the former. At Orsett, also near this outcrop, the water contains both these salts. Such great variation over so limited an area does not point to free intercommunication nor to a continuous flow of underground water in any direction. It points rather to a condition approaching stagnation, allowing local influences to exert a maximum effect. The water is



imprisoned here, it passes from Kent under the Thames towards Essex, but finding no outlet to the north, it is forced through fissures into the bed of the Thames. (The analysis of the Thames water shows a large admixture of Chalk water with sea-water.) Excessive pumping may reduce the level of the water at the Essex side, so that water from Kent, or even from the river, may flow in to restore equilibrium. This water may possibly find a more free course through the alluvium covering the Chalk than through the deeper Chalk, in which case it would be derived from the river chiefly, and be altered in character to a certain extent by passing horizontally through this alluvium. Doubtless, a certain amount of water enters the South Essex Chalk on its outcrop, from the rainfall, and some may also enter it from the deep Chalk to the north-west. The flow from the Kent side, however, must be much the greater, and the two waters doubtless meet under the Thames. Certain of the wells at Barking yield a water containing carbonate of sodium, and resembling that found under Central Essex, and possibly any little flow that exists of this water is in the direction of Barking. The water-level in these wells, however, has fallen with such extraordinary rapidity during the last two years that it cannot be long before the pressure from the Thames side will make itself felt by the influx of calcium and magnesium salts, since the Chalk near the Thames is admittedly infiltrated with river water. This over-pumping from the Chalk in the south of Essex is likely to have very serious consequences, for the continued depression of the water-level below that of the sea will lead to the infiltration of sea-water on the east and of tidal water on the north and south. Sea-water is known to gain direct access to the Chalk on these three sides, and the distance to which it will travel inland will depend entirely or almost entirely on the extent to which the general water-level is lowered. Continued observations and systematic records of analyses alone can show whether this prognostication is likely to be verified, and these warnings, if regarded, may prove of the greatest importance to the





TABLE II.—CHALK WATERS FROM VARIOUS SOURCES.  
In Parts per 100,000.

Locality.	Depth of Chalk from Ground Surface.	Calcium Carbonate.	Calcium Sulphate.	Calcium Nitrate.	Calcium Chloride.	Magnesium Carbonate.	Magnesium Sulphate.	Magnesium Chloride.	Sodium Carbonate.	Sodium Sulphate.	Sodium Chloride.	Sodium Nitrate.	Silica, etc.	Total Solids.
23. Dunmow ...	190	23.5	...	...	...	5.2	6.5	...	...	2.3	6.75	1.25	.6	47.0
24. Romford ...	266 ?	13.25	...	...	...	10.15	3.25	...	...	4.6	10.15	.6	1.0	43.0
25. Portsmouth ...	475	18.75	...	...	...	1.0	16.0	...	...	5.05	81.35	.25	5.6	128.0
26. Gosport ...	164	16.5	...	...	...	3.5	1.5	...	...	9.2	52.8	.4	3.1	87.0
27. Ditto (later) ...	164	18.0	...	...	...	4.2	9.1	...	...	...	60.2	.2	1.9	95.0
28. Barking Creek ...	22	28.2	2.5	...	...	...	7.4	18.55	...	...	112.45	.5	.4	170.0
29. Ditto ...	82	29.8	...	...	...	...	13.1	9.9	...	...	75.9	.7	.6	130.0
30. Grays (boring) ...	s*	27.2	12.2	4.6	3.4	...	...	9.9	...	...	62.7	...	3.5	123.5
31. Ditto (spring) ...	s	22.5	9.7	3.95	...	...	...	4.95	...	...	24.75	...	.15	66.0
32. Ditto (two years later) ...	s	23.8	13.75	11.25	...	...	...	11.45	...	...	57.85	4.55	1.35	124.0
Thames Water	...	16.3	71.4	...	...	...	129.5	154.8	...	...	1422.8	2.5	56.7	1854.0
33. Mucking (Stanford) ...	220	21.5	...	...	...	...	12.15	...	...	...	11.25	1.1	.5	46.5
34. Mucking Ford ...	51	16.5	5.0	3.15	...	...	...	1.6	...	...	2.75	...	.5	29.5
35. Orsett ...	70	18.0	6.45	...	...	...	18.5	...	...	17.7	6.45	10.7	3.2	81.0
36. Bishop Stortford ...	s	26.5	4.0	...	...	...	...	2.0	...	...	.5	1.4	2.6	37.0
37. N. Safron Walden ...	4	26.3	2.05	...	...	...	...	.8	...	...	2.0	2.95	3.4	37.5
38. Ditto ...	72	31.25	2.05	...	...	...	1.55	1.2	...	...	1.0	.3	4.7	42.0
39. Coggeshall ...	226	10.5	...	...	...	8.4	...	...	12.7	9.9	27.2	1.8	4.0	74.5
40. Kelvedon ...	257	4.0	...	...	...	4.35	...	...	27.6	7.9	50.9	1.1	4.65	100.5
41. Witham ...	279	2.5	...	...	...	2.65	...	...	31.8	8.0	79.4	.0	2.2	126.5

s\* Chalk at ground surface.



inhabitants of the county who have to depend upon this source for their water supply.

Analyses 36, 37, and 38 are of Chalk waters from the outcrop at the north-west of the county, and show that they contain an unusually large amount of chalk in solution, but very little sulphate of calcium or common salt."

Especial reference to the water supply is made in the following reports :—

**BARKING.** Supplied by the South Essex Company. Samples submitted to analysis were reported wholesome, but the Chlorides are increasing. The Water Company now insists on storage cisterns being provided, and as difficulty has arisen in connection with the cleansing thereof the town is seeking powers from Parliament to enable them to make bye-laws for securing the proper cleanliness of such receptacles.

**GRAYS.** The water, though hard, is good. The supply is constant.

**ILFORD.** This town is served both by the East London and South Essex Companies. Great inconvenience was caused during the summer by the break down of the water supply of the East London Company, and the only partial supply of the South Essex Company.

**LEYTON.** Supplied by the East London Company. The Medical Officer says, " We have again been visited by a severe and serious water famine. The long continued summer drought, following on an exceptionally dry spring, resulted in the gradual depletion of the reservoirs of the East London Company. A vast amount of inconvenience was caused."

**WALTHAM HOLY CROSS.** Although at the extreme limit of the water supply of the East London Company, at no time throughout the year was the supply curtailed, or the quality anything but perfectly pure. Forty-one samples of well water were analysed. Many were polluted, several taken in proximity to a Churchyard appeared to be affected thereby. Statutory

notices were served to all owners of polluted wells, ordering them to connect with the mains. These have not as yet been complied with in all cases.

WALTHAMSTOW. Supplied by the East London Company "Although the district has nominally a constant supply, great inconvenience and hardship were caused during the late summer months owing to scarcity and insufficiency. In August the supply was limited to a nominal six hours per day, and subsequently curtailed to four hours, which continued until November. I endeavoured to obtain a constant supply to the Public Elementary Schools, with negative results. The plea of the Water Company was that if they gave the Schools, what undoubtedly they should have—a constant supply—there would be a great waste of water by consumers in the neighbourhood of the Schools. That there was no waste of water in your district, I can answer positively from personal examination of homes throughout the district. That the children must have suffered from the want of water for drinking purposes is undoubted, except they drank water from the cisterns, which no one would regard as safe."

"I failed to connect any disease as directly the result of the insufficient supply, but the insufficiency points to the necessity of public control over a necessary for every day life."

WANSTEAD. The Water supply (East London Company) had to be curtailed to two hours daily. Water carts were requisitioned to meet emergencies. "Summer diarrhœa was prevalent there, as might be expected." It is to be hoped that the East London Company have now learned a lesson, for the serious failure of water supply has occurred two years in succession.

BRIGHTLINGSEA. The Council have arranged to purchase the Water Company's Works, and now are engaged in making a boring into the Chalk to obtain, if possible, a supply from this source.

BUCKHURST HILL. Quality satisfactory.



BURNHAM. A supply of 30,000 gallons per day is obtained from two tube wells driven into the superficial gravel. "Of good quality, supply constant."

CHELMSFORD. The Medical Officer of Health says: "We are practically in the same position as last year." Water is derived from a deep well and two subsoil springs. Water from each source has been examined and found satisfactory. Should either of the subsoil supplies become contaminated, the water supply to the Borough would be greatly restricted. From my point of view, I consider that the question of increasing the available water supply to the Borough is perhaps the most urgent sanitary question at the present time before the Council."

CLACTON. The Council have arranged for the purchase of the Water Company's undertaking, and are sinking a deep well at or near Bentley. The scheme for supplying sea water has been completed, and stand pipes erected in various localities, so that the inhabitants may derive supplies therefrom.

COLCHESTER. The town is now supplied exclusively from the deep well in the Chalk. Besides the Garrison, 7,126 houses are supplied, 162 of these being in the Lexden and Winstree Rural District.

EPPING (U). Supplied by the Essex and Herts Company. Many houses not yet connected. In many instances notices to connect have been served, but not complied with.

HALSTEAD. Supplied from a deep well in the Chalk owned by the Council. The water acts on the iron pipes, and is sometimes very turbid. The Medical Officer of Health suggests regular flushing. He also refers to the danger arising from the direct connection of Water Closets with the mains.

MALDON (U). The Council have arranged to purchase the Water Company's undertaking. During the summer there were many complaints of want of water. The supply (from two deep wells) is intermittent. Two public well waters



were examined. One was condemned, and the other reported as not being safe. Neither had been closed, but a board has been attached to one "giving warning of the danger attending its use."

**SOUTHEND.** The analyses of the Company's supply were satisfactory. The Council were not successful in obtaining the insertion in the Southend Water Company's Act of a clause giving them power to inspect the wells, reservoirs and works, with a view to satisfying themselves that due precautions are taken to prevent contamination of the water. As a matter of courtesy, however, the Water Company gives notice when the supply is being cut off from a house. The water supply to Southchurch is still very unsatisfactory, but the Company contemplate an extension of the mains in that direction, when arrangements have been made with private owners of property.

**SAFFRON WALDEN.** The Sanitary Committee have under their careful consideration the Water Supply of the town, and the Medical Officer of Health presented to the Council the following Special Report:—

"In a recent Circular Letter the Local Government Board called the attention of the Council to the subject of the Water Supply of the District, stating that the importance of a wholesome supply of water need not be emphasized in view of the serious epidemics of Enteric Fever which have of recent years been brought about by the specific contamination of water supplies and expressing their desire to impress upon the Council the importance of taking the matter into their serious consideration, with the object of guarding the district against dangers, the gravity of which has been sufficiently shown by recent examples, and further pointing out that in order to fulfil the obligation imposed upon the Council by Section 55 of the Public Health Act, it behoves them to exercise every precaution to secure that the water which they deliver to the consumers shall be protected from risk of contamination reaching



the well from which the town is supplied, and trusting that if it may upon investigation appear that further works for the improvement or protection of the existing supply are needed, that the Council will execute the necessary works. I have already brought the matter under the consideration of the Sanitary Committee, and have reminded them that the existing deep bored well from which the town is supplied was made by the late Jabez Gibson, Esq., more than 60 years ago, and lined with 4 or 5 inch iron tubes, the soundness of which as a protection from risk of pollution no one could possibly guarantee after the lapse of so long a time. The existing well could however be made quite safe if it could be lined with new strong tin-lined copper tubes of suitable diameter, but this could not possibly be done without depriving the town of its supply for a considerable period, and when done would probably be too small in diameter for the requirements of the town. I have therefore suggested to the Committee that an entirely new boring at a spot about 70 feet from the present boring should be made and lined in the first instance to a depth of about 74 feet, with strong steel tubes 7 inches in diameter, driven tightly down into the bed of hard chalk rock (met with at that depth in the old boring), and the boring continued below at nearly the same diameter for another 200 feet, or more if found advisable. When this is completed the boring should be lined with stout tin-lined copper tubes 6 inches in diameter, to be connected with the existing pumps and carried with perfect air and water tight joints down the new boring to a depth of say 270 feet from the surface of the ground, so that no water can possibly enter the tubes except at that depth. According to report the boring of the present well was carried to a depth of over 1000 feet, but as the main supply was found at a depth of about 270 feet from the surface it will probably not be necessary to bore much below that depth to obtain an inexhaustable supply of water. When the new boring is finished, and a supply from it for the town is available, the old historic boring can then be lined in a similar way with tin-



line copper tubes, so as to preserve the old well and provide an auxiliary supply. The town will then have a water supply which in my opinion will be above suspicion, as the contaminated surface water which at this point stands about 17 to 23 feet from the surface, according to the season, would have to find its way down over 250 feet below the line of saturation of the main chalk water against the opposing upward hydrostatic pressure of the deep spring. The whole of these necessary works could be executed at a cost, which I believe, will not exceed £500."

"The Council have ordered the Report to be laid before the Water Undertaking Committee, with a view to that Committee undertaking the boring of a new well, and doing such of the work as I have advised on the lines of my Report."

WALTON. Supplied by the Tendring Hundred Company. Plentiful and satisfactory. In the rural portion of the district, however, the supply is from shallow wells.

WITHAM. "This subject (water supply) has," says the Medical Officer of Health, "engaged much of your time during the past year, but I regret to find with no practical result. I would suggest that without loss of time, and to enable you to grapple with this most important matter, you should employ a proper engineer to examine the origin of the present supply, the quantity that is to be obtained, and the best method of conveyance to the various parts of the town. At the present time nothing definite is known of the origin or quality of the supply, and these are the two important factors to be taken into consideration before any scheme can be formulated, and before any purchase of ground in the locality of the outlet can be of service, to protect the water from pollution. As examined from time to time during the past year, the quality is good, but it is very hard and deposits upon the interior of boilers, kettles, etc. At the present time the town supply is formed by four-fifths of this spring water, mixed with one-fifth from the artesian well (chalk). I cannot advise any further experiment in the way of an artesian well, with the facts that three



existing wells of this kind in Witham are more or less failures. The necessity for an increased supply will become more urgent with the building of houses in the various parts of the town, and there are at present two parts inadequately supplied, whilst others have no proper supplies."

WOODFORD. Supplied by the East London Company. The supply was limited during the summer, and the Medical Officer of Health thinks this scarcity helped to swell the number of deaths in August and September. Attention is directed to a deficiency of supply, caused by landlords requiring the taps leading from the mains to be only partially turned on.

WIVENHOE. The Council are undertaking a public water supply from a deep boring into the chalk. The present supply from wells and springs is unsatisfactory.

In the rural districts of the County the prolonged drought caused great inconvenience, many wells and springs failed altogether, and in certain parishes the inhabitants suffered greatly from the want of water, and had to purchase it at from  $\frac{1}{2}$ d. to 2d. per pail.

BELCHAMP. Water carts were used in several parishes. A new well was sunk for the supply of Gestingthorpe. At New Barn in Bulmer a new well, 95 feet deep, was sunk.

BILLERICAY. A supply of water has been found for Slyce's Gate and South Green, but the necessary works to render it available have not yet been carried out. Many parts of the district require water, and power was obtained last session to demand a supply from the Southend Water Company for the parishes of Vange, Pitsea, and Bowers Gifford. Unfortunately this demand cannot be made until the wells in Bowers and Fobbing have been sunk. A well has been sunk on Little Warley Common to supply the inhabitants there, and the supply promises to be sufficient.

BUMPSTEAD. An application was made to the Local Government Board for power to borrow £250 to raise water by means of a windmill from an existing well at Pale Green,



and to convey it by pipes to the cottages. Sanction was refused, on the ground that the quality of the water was not satisfactory, as it contained a quantity of sulphate of lime and magnesia, and might have a purgative action, and might possibly corrode iron pipe. A water cart had to be requisitioned to convey water to Crook's End.

CHELMSFORD, R. The prolonged drought here is affecting all the public supplies (derived from springs) seriously, and schemes are being considered for increasing the available water. For Ingatestone a well into the chalk is suggested. The Local Government Board have given their sanction to the scheme for supplying the village of Writtle. Improvements have been made in several village supplies.

EPPING, R. The public well at Roydon has been deepened, and the supply of water increased. A public well has been sunk at Rye Hill. Previously water had to be carted round in dry seasons, and supplied at 1d. per pail. New wells have also been sunk at Matching and Hastingswood Common.

HALSTEAD, R. The water supply to Earls Colne requires the early attention of the Council. Many public wells and springs have been improved, so as to render pollution less probable. A number of hamlets are still very badly supplied. The prolonged drought, however, directed attention to the sources of public supply, and lead to efforts being made to improve them.

LEXDEN AND WINSTREE. The Medical Officer of Health again directs attention to the condition of Salcot, Virley, and Great and Little Wigborough. These parishes are practically dependent upon ponds. He advocates the utilization of a spring rising in Pod Wood. More water is required in Stanway. A portion of the parish is supplied from the Colchester mains, but terms cannot be arranged for the extension of the supply.

MALDON, R. The District Council have decided upon a public supply for the parishes of Woodham Mortimer, Hazeleigh, Purleigh, Latchingdon, Althorne, Cold Norton, Stow



Maries, and North Fambridge. The total cost is estimated at £10,775, and the Local Government Board have given their sanction to the scheme. During the summer the Council arranged for water carts to go round several parishes two or three times a week. When the large and comprehensive scheme is satisfactorily completed the Council will, doubtless, direct their attention to other parishes also requiring water.

ONGAR. A local Company has provided a public water supply. The Medical Officer of Health, however, says that it "cannot at present be considered satisfactory for drinking. The source from which this water is derived appears to me in danger of being at any time tainted with both animal and vegetable impurities. I have observed that this water is conducted to the reservoirs by unprotected channels, open to cattle, and to decomposing vegetable and other organic substances, so that however pure it may be shown to be by analysis at any particular time, it is liable at any moment to serious contamination, with results which recent experiences have shewn to be most disastrous to the public health."

ORSETT. Laindon Hills is the worst supplied village in the district. The more populous parishes (except Stanford) are supplied by the South Essex Company.

ROCHFORD. So great was the want of water, during the summer, in South Benfleet that an arrangement had to be made with the London and Tilbury Railway Company to convey water in an iron tank from Low Street. The Rochford wells practically failed. The Council, very wisely, have decided to undertake a comprehensive scheme for supplying the parishes of South Benfleet, Hadleigh, Hawkwell, Hockley, Rayleigh, Rochford, and Thundersley from a deep well in the Chalk. Application has been made to the Local Government Board for sanction to the scheme.

SAFFRON WALDEN, R. Mr. Hennell's scheme for a public water supply for the village of Newport is either to utilize the boring made last year at the south end of the village, or to



make a new boring at a point still further southwards, as the chalk is certain to be found in that direction, whereas northwards it is uncertain, and a site has been selected 150 yards southward of the existing pump, but there are other sites that would answer equally well. From the boring it is proposed to pump the water with an oil engine into a high level reservoir (about 250 feet above Ordnance Datum), to hold 30,000 gallons, and to provide a 4-inch main and 3-inch branch mains. The estimated cost for works of water supply was £1,200, but to this sum certain additions have since been made and the Rural District Council have resolved to apply to the Local Government Board for their sanction to a loan of £1,500 for works of water supply for the parish of Newport. The purity of the water from the existing boring has been ascertained by three independent analyses, all of which were satisfactory except as far as the water contains some iron, which is probably derived from the iron bore tubes. The water supply of Langley has been under the consideration of the Rural District Council during the year, and it has been decided to sink a well on the Lower Green to a depth of about 120 feet through the Boulder Clay into the Chalk, and an application has been made to the Local Government Board for their sanction to a loan of £150 for works of water supply for the parish of Langley. At Elmdon improvements have been effected in the village water supply during the year, with a view to protecting the water from contamination at its source. At Widdington the iron pipes leading from the reservoir to the village were found to be corroded and worn out, and the Rural District Council have ordered them to be taken up and re-placed with new 2-inch cast iron pipes. At Hempstead a spring running into the river, which had been used by some of the inhabitants, has been caught at its outcrop and enclosed in large earthenware socket pipes (2 feet in diameter), by means of which the spring has been raised quite six feet above its old level, and the supply has been brought in pipes to a pump on higher ground by the roadside. The water supply at Hadstock, which is derived



from a shallow well *in the Church-yard*, has also been under consideration, but no decision has been arrived at as the supply has been reported to be very pure, but notwithstanding this the source of the supply is obviously open to risk of pollution.

#### SEWAGE AND REFUSE DISPOSAL.

The subject of sewage disposal is one which is exciting a good deal of attention in the County at the present time. The increasing population is rendering existing systems inadequate, and in other places the present methods of treatment are unsatisfactory. The object of every authority appears to be to get rid of the necessity for using land. In many districts land is difficult to acquire, and in others the available land is too heavy or too water-logged to be of any service. At the present time a Royal Commission is engaged upon the subject of sewage disposal, but inasmuch as it may be years before a Report is presented and the subject is pressing, authorities cannot wait. The two systems which are now in favour are the Septic Tank and Bacterial Filtration, the systems of Mr. Donald Cameron and Mr. Dibdin respectively. Both may now be said to be fairly on their trial, but it will be some time before it can be definitely determined whether or not they are satisfactory. Meanwhile the Local Government Board will sanction no scheme which does not provide land for irrigation purposes, although a smaller amount is required where one of these systems is adopted than where the sewage undergoes no previous treatment.

Septic Tanks are being tried at Warley and at Hornchurch in the Romford Rural District, and bacterial filters at Ilford, Buckhurst Hill, and Woodford. The results are being watched with interest.

BARKING. Many streets have been reseeded and the ventilation of other sewers improved. The lower portions of the district where no fall can be obtained are having Shone's system applied for lifting the sewage. The Medical Officer of Health complains of the outfall of the East Ham Sewage Disposal Works.



**BRIGHTLINGSEA.** A scheme for completely sewerage the town has been prepared. The sewage will be treated by some precipitation process, and after filtration be discharged at the mouth of the Colne, at a point where float experiments have shown that it will be carried out to sea.

**BUCKHURST HILL.** The bacterial system of filtration is being tried with a portion of the sewage. After filtration it will be passed through land. There is every reason to believe that this system will be successful in producing a satisfactory effluent.

**BURNHAM.** The sewage is here treated with sulphate of iron and lime, but the effluent is not satisfactory considering the proximity of the outfall to the oyster layings, and the works are too near the town. Scavenging is done by contract, the ash-pits being emptied once a fortnight.

**CHINGFORD.** "The Pumping Station on Mansfield Hill and the Sewage Farm on Chingford Road have been sources of grave anxiety to the Urban District Council from the very first moment they assumed the reins of office." As the population increases the present arrangements are likely to prove quite inadequate, and the Council therefore regard with favour the Lee Valley drainage scheme.

**CLACTON.** The existence of "nasty ash-pits" at the back of houses is highly objectionable, the Medical Officer of Health advises their abolition and the substitution of portable ashbins. These could be placed outside every morning and collected by the dust cart. The Council is providing a "town yard," and it is suggested that when this is acquired the Council could become the possessor of horses and carts, and undertake the scavenging at present done by a contractor.

**EAST HAM.** For scavenging purposes the district is divided into six divisions. Fourteen carts and 20 men are employed under a responsible foreman. Most of the refuse is tipped at the Sewage Works; some is disposed of for brick making.



EPHING (U.) The dry weather caused trouble at the Sewage Farm, sewage escaping through cracks in the ground, polluting Cobbins Brook.

HALSTEAD (U.) The farm here is not too large for the efficient treatment of the town sewage, and the Medical Officer of Health thinks that pressure ought to be brought to bear on the County Council to provide surface drainage for the main roads under their control. This would diminish the volume of sewage in wet weather, and "miminish the risk of sewage polluted storm water overflowing from the farm into the river."

HARWICH. There are portions of Dovercourt urgently in need of sewers. At present the houses appear to drain into ditches, causing a nuisance and endangering the purity of the water derived from shallow wells.

ILFORD. The Sewage Works here are being entirely reconstructed. Large coke-breeze filters are being laid down, and it is intended to pipe the effluent into the Thames.

LEIGH. A complete system of sewerage has been designed, and powers are being sought from Parliament in order to carry out this and other contemplated improvements. The sewage will be filtered through coke-breeze and the effluent discharged during the ebb tide into the river.

LEYTON. The District Council contemplate the reconstruction of their Sewage Works, the expense of maintaining the present precipitation works being very heavy, and the disposal of the sludge produced very difficult.

MALDON (U.) Offensive smells arise from the sewer man-holes. This appears to arise from inadequate flushing and ventilation. Flushing tanks are being fixed, and tall ventilating shafts provided. There is no regular system of scavenging. Decaying matter is often allowed to accumulate for weeks or months. Public scavenging is advocated.

**SOUTHEND.** The Eastern Valley Sewerage System is now in operation, and the Western Valley in process of construction. Some sewage is still discharged on the foreshore. The drainage of Prittlewell is under consideration. Much of the house refuse is deposited in the brick-fields bordering on Sutton Road, and is burnt in the open air, "giving off most offensive fumes, dangerous to the public health." The Medical Officer of Health strongly urges the Council to provide a refuse destructor.

**SAFFRON WALDEN (U.)** Much needed extensions of the sewerage system cannot be carried out because the Local Government Board refuse to sanction a loan until proper arrangements are made for purifying the sewage of the town.

**SHOEBURYNESSE.** The eastern outfall sewer has been extended 300 yards seaward, with beneficial results. The earth closets in the town are emptied three times, and the ash-pits once per week.

**WALTON.** The much needed sewerage scheme it is hoped "will not long be a thing of the future, but an accomplished fact."

**WYVENHOE.** Privies and ash-pits are scavenged by men employed by the Council, and the contents deposited a mile from the town, and 400 yards from any dwelling house. The scavengers use disinfectants when emptying the pans and privies. Plans for a complete system of drainage have been adopted. The sewage will be treated on the "septic system."

**WALTHAM HOLY CROSS.** Improvements have been effected in order to facilitate sewer flushing, but the Medical Officer of Health points out the absurdity of attempting to flush a 9-inch sewer with a 3-inch hose pipe.

**WALTHAMSTOW.** Considerable friction has arisen with a neighbouring authority on account of the objectionable character of the sewage farm effluent. The sewage is treated at the works on the farm by the black-ash process, and sub-



sequently filtered through land. The Medical Officer of Health thinks the Septic Tank system would solve the problem.

BELCHAMP (R.) The Lyston ditch conveys sewage, storm water and brewery washings from Foxearth. It has recently been cleaned out.

BRAINTREE (R.) At Kelvedon it is stated that considerable improvement has been made in the drains and sewers in the High Street. Where the sewage discharges into the sewer an interceptor and filter has been placed, which renders the effluent colourless and inoffensive in character.

BILLERICAY. The sewerage of Billericay discharges into ditches, and thus constitutes a nuisance of a more or less serious character. An engineer has been consulted, and a sewerage scheme prepared, but the Council have not adopted it on account of the expense. As "in many places the nuisances are serious, steps should be taken to remedy them without delay."

CHELMSFORD (R.) The sewage of Writtle seriously polluted the River Cann during the summer. A sewerage scheme has been adopted by the Council, and the approval of the Local Government Board secured, and, doubtless, will soon be commenced. Minor improvements in the drainage arrangements of groups of houses are chronicled.

EPPING (R.) "The system of drainage which it has year after year been hoped would be provided for Woburn Avenue, and other parts of Theydon Bois, has not yet been commenced, and it is obvious that with the additions to the number of houses which is constantly taking place, the need for proper drainage there becomes more urgent. In certain parts of Chigwell the drainage is still of the most primitive character, and some attempt should be made to prevent the continued pollution of the Roding." Other parts of the district also are insufficiently drained.

HALSTEAD (R.) Some improvement has been effected in the drainage of Earls Colne, and the Council are considering a scheme for purifying the sewage before its discharge into the river (Colne). In Castle Hedingham and Sible Hedingham the drainage arrangements have been improved.

LEXDEN AND WINSTREE. At Rowhedge sewage is discharged into a ditch, and the whole of the drainage goes into the river. The Medical Officer of Health some years ago directed the attention of the Council to the unsatisfactory character of the drainage here. "The present condition of things is most insanitary, and ought to be altered without delay." The drainage of West Mersea also requires attention.

MALDON (R.) The present system of sewerage in Southminster is unsatisfactory, and the Council are considering a scheme for improving it, or entirely re-constructing it. The drainage of Lower Althorne is very defective, and gives rise to serious nuisances. An extension of the sewer at Tollesbury has been decided upon, and at the outfall purification works will be constructed.

ONGAR. A scheme for sewerage of Ongar town has been approved, and should be carried out without unnecessary delay. "Plans for the more satisfactory drainage of Abridge, Blackmore, and High Ongar are also ready, and it is to be hoped that these places will shortly be in a more sanitary condition."

ORSETT. A sewage tank van for emptying cesspools has been provided for Stanford-le-Hope, and arrangements made for public scavenging the village. Public scavenging has also been undertaken at Tilbury Docks, West Thurrock, and Little Thurrock. The sewerage of Stanford-le-Hope and of South Ockendon requires attention.

ROCHFORD. The drainage arrangements in several villages have been improved. In Rochford the sewage gave rise to a serious nuisance, and an engineer was consulted. Alterations were made at the tanks but, as yet, the result has not been



very successful. The scavenging arrangements here are very unsatisfactory. The Medical Officer of Health says, "I should strongly advise that when the next contract is entered into the more frequent and regular removal of house refuse should be insisted upon."

ROMFORD (R.) The villages of Dagenham, Beacontree Heath, Rainham, Hornchurch, and Harold Wood require sewerage.

SAFFRON WALDEN (R.) A scheme for sewerage of the village of Newport has been prepared, but its consideration has been postponed at the request of the Parochial Committee.

STANSTED. A new scheme of drainage for Stansted Mountfitchet is being considered. At the present the houses chiefly drain into cesspools, which are emptied by men employed by the District Council.

TENDRING. The new sewers at Frinton are working satisfactorily. The town of Manningtree discharges its sewerage in a crude state into the river Stour. Nearly 20 years ago the drainage of this place was considered, and a Local Government Board enquiry held. The cost, however, was considered prohibitive. The Medical Officer of Health thinks that "the septic tank might help out of the difficulty."

#### RESULTS OF SYSTEMATIC INSPECTIONS.

It is to be regretted that in many districts systematic inspections are not made (or the results not recorded) since the results of such inspections, where made and reported upon, shew what an enormous number of insanitary conditions exist. There is little doubt that where systematic inspections are not made, a greater number of nuisances exist, but that they are only brought to light by the complaint of some person affected, or by outbreaks of infectious disease.

No Inspector's Reports have been received from the following districts:—Braintree (U.), Harwich, Romford (U.), Witham, and Ongar. With reference to the last-mentioned

district, the Inspector has supplied a special report, but it does not give the information required for ascertaining to what extent house-to-house inspection is carried on.

The following table should be of great interest, shewing, as it does, how much more thoroughly inspections are carried on in some districts than in others, and how small a proportion of nuisances are detected in certain districts compared with others. The number of houses inspected per 1,000 population varies, in the Urban Districts from 4 to 123, and in the Rural Districts from 7 to 70. The table also shews that in many districts the average number of nuisances detected exceeds one for each house examined, whereas in others the proportion does not exceed 1 per 6, 7 or 8 houses. In these cases either the inspections are much less thorough, or the sanitary condition is much more satisfactory.

I hope next year to be able to obtain such information as will enable a definite opinion on these points to be expressed.

URBAN DISTRICTS—		Number of Houses inspected per 1,000 population.		Number of Nuisances detected per 1,000 population.
Barking...	...	54	...	57
Brightlingsea	...	17	...	24
Buckhurst Hill		114	...	57
Clacton ...	...	25	...	15
Chelmsford	...	45	...	79
Chingford	...	79	...	21
Colchester	...	17	...	13
East Ham	...	49	...	73
Epping ...	...	100	...	25
Grays ...	...	80	...	32
Ilford ...	...	68	...	28
Leyton ...	...	36	...	25
Maldon ...	...	23	...	10
Saffron Walden		123	...	15
Shoeburyness ...		—	...	24



Southend	...	32	...	11
Waltham Cross		60	...	52
Walthamstow	...	35	...	21
Walton	...	11	...	5
Wanstead	{ All houses said to have been inspected. }			6
Woodford	...	4	...	5
Wyvenhoe	...	22	...	26
RURAL DISTRICTS—				
Belchamp	...	70	...	4
Bumpstead	...	33	..	15
Chelmsford	...	28	...	4
Epping	...	21	...	15
Halstead	...	54	...	14
Lexden and Winstree		36	...	8
Maldon	...	62	..	15
Orsett	...	26 (about)		17 (about)
Rochford	...	7	...	5.5
Romford	..	—	...	9
Saffron Walden		66	...	9
Stanstead	...	48	...	19
Tendring	...	24	...	7

#### POLLUTION OF THE RIVER RODING.

The Medical Officer of Health for Barking says that since 1895, when his attention was first directed to the condition of the river, it has been gradually getting worse. "The enormous population of so many districts through which it flows, changing small hamlets and villages into large suburban communities, is mainly responsible for the condition of things which caused so much annoyance, and I fear disease and death to the inhabitants of Barking during the summer." In dry seasons the river is practically sub-divided into a series of stagnant pools, the springs and sewage feeding it being not even sufficient to compensate for the loss by evaporation and percolation. The river is tidal as high as Ilford, and into this portion the large volume of sewage effluent from the Ilford

works is poured, but unfortunately the conditions are such that this has not free access to the Thames. The river is dammed at the mill by Barking Quay, and the navigation rights require that sufficient water shall be kept in above Barking to allow barges to get up to Ilford. Besides insisting upon a higher degree of purification before allowing any sewage effluent to enter the river, the Medical Officer of Health for Barking also suggests that the mill gates, and the gates owned by the Essex Sewers Commissioners, should be opened so as to allow the sewage to get away with every tide, and that the old water-wheels be again brought into use. At the present time the river is fouled by sewage or sewage effluents from the Ongar and Epping Rural Districts, Woodford, Wanstead, and Ilford Urban Districts. Steps are being taken to stop this pollution as quickly as possible.

#### THE LEA AND RODING VALLEY DRAINAGE SCHEME.

On October 26th, 1898, a conference of local authorities in the Lea and Roding Valley was held at the offices of the Lea Conservancy Board, when a scheme for a Lea and Roding Valleys main outfall sewer was submitted by Mr. G. Chatterton, M.Inst.C.E., Westminster, and Major Lamrock Flower, Sanitary Engineer to the Lee Conservancy Board. The scheme is of such importance to the county that a brief description of it may be included in this report.

The scheme is founded on a report on Walthamstow made to the Lea Conservancy Board by Major Lamrock Flower in 1897, dealing with the problem of the disposal of the sewage of Walthamstow and Leyton. In this report he urged that the only solution of the difficulty was the adoption of a scheme for taking the sewage right out of the valley. (Such a scheme had many years before been proposed by Sir Joseph Bazalgette.) The population of the Roding Valley having increased so considerably the authors decided to include the valley of the Roding in the Lea scheme. The Lea valley sewer would commence at Hertford Sewage Works, pass the Edmonton Sewage Works, the Chingford Sewage Farm, and



the Walthamstow and Leyton Works. It would then pass in a south-easterly direction and receive the sewage of the Roding valley, about half a mile west of Barking town. The joint sewer would then be carried to the proposed outfall in the parish of Dagenham. The sewer would be laid at such a level that there would be no local pumping.

A sewer would be laid up the Roding valley, serving Wanstead, Woodford, Buckhurst Hill, Chigwell, and Loughton, terminating at the sewage works of the last-mentioned town.

The estimates provide for branches to (a) Bishops Stortford, (b) Waltham and Epping, and (c) East Barnet and Friern Barnet.

The land required for the outfall works would not be more than 25 acres. On this site the sewage would be pumped into tanks, where, after the addition of chemicals, the sludge would be allowed to settle. The tanks would be at such a level that the clarified effluent could be run off into the river at all states of the tide. The sludge would be run through pipes into barges and carried out to sea.

There is no doubt that such a scheme would properly and permanently dispose of the sewage of the two valleys.

The total cost of the scheme is estimated at £919,233 made up as under :—

	£	£
Lea Valley Sewer ... ..	487,505	
Branches ... ..	64,922	
Roding Valley Sewer...	31,429	
Effluent Outfall Pipes ...	44,121	
	<hr/>	627,977
The Works at the Outfall ...		95,200
Land and Easements...		69,500
Contingencies, 10 per cent. ...		72,318
Engineering and Supervising, 7 per cent. ... ..		54,238
		<hr/>
		<u>£919,233</u>

The estimate of the annual cost is as under:—

	£
Re-payment of Loan and Interest, 3 per cent., spread over 30 years ... ..	46,684
Pumping, Chemicals, and dealing with Sludge ... ..	12,858
	<hr/>
Total annual cost ... ..	£59,542
	<hr/>

Based upon the present rateable value of the districts served, a rate of 1d. in the £ will produce £7,857, therefore a rate of 7½d. in the £ would produce the amount required.

The portions of Essex served by this scheme would be Harlow, Roydon, Epping, Waltham Holy Cross, Chingford, Walthamstow, Leyton, Loughton, Buckhurst Hill, Woodford, Wanstead, Ilford, East Ham, and Barking. At any time the drainage of Romford, Hornchurch, and Dagenham could be provided for.

Modifications of this scheme were shown to be feasible, but as these do not affect our county, or reduce the cost thereto, it is not necessary to give details thereof.

The main objections to this scheme are, first, that a great portion of initial expense will be incurred in serving comparatively small places for up the Lea valley, and which have no connection with this county, second, that the estimate for treating the sewage is considerably below what it would actually cost.

Mr. Santo Crimp, M.Inst.C.E., has kindly gone into another scheme, proposed by me as an alternative, and which would affect this county only. Although apparently much more economical than the larger scheme of Messrs. Chatterton and Lamrock Flower, it has not met with any more cordial reception. An outline of it is given here, to enable the two schemes to be compared.



The sewer would commence in the Roding valley at Buckhurst Hill (being continued further up the valley later, if necessary), pass the sewage works at Woodford and Wanstead, and join a second sewer from Walthamstow and Leyton at Ilford. The combined sewer would then receive the sewage of Ilford, East Ham, and Barking, and receive a branch from the Rom valley, carrying the sewage of Romford, Hornchurch, and Dagenham. It would terminate on the marshes at or near Barking.

The outfall works would be practically the same in character as those suggested in the larger scheme, but the population to be served being smaller, would be less extensive.

The estimate of cost is as under:—

	£
19 miles of Sewer ... ..	100,000
The Outfall Works ... ..	75,000
Land and Easements ... ..	25,000
Contingencies, 10 per cent. ..	17,500
Engineering, etc., $7\frac{1}{2}$ per cent. ...	13,125
	<hr/>
Total cost ... ..	£230,625
	<hr/> <hr/>

The annual cost would be:—

	£
Re-payment of Loan and Interest ... ..	10,352
Cost of Sewage Treatment, etc. ... ..	15,000
	<hr/>
Total annual cost ... ..	£25,352
	<hr/> <hr/>

The rateable value of the districts served is at the present time approximately £1,200,000 (more rather than less), and a 1d. rate would, therefore, produce £5,000. A rate of  $5\frac{1}{4}$ d. would more than cover the annual cost.

The works are calculated to serve a population of 1,100,000, or about four times as many as at present reside in

the area served. As the population increases the rateable value will also increase, and possibly the ultimate rate required would not exceed  $3\frac{1}{2}$ d. or 4d.

If the same basis is accepted for the treatment of the sewage as that adopted by Messrs. Chatterton and Flower, a 4d. rate would about suffice in the first instance.

So far as this county is concerned, such a scheme as this would be more generally serviceable and far cheaper than the larger scheme. It must also be remembered that the authorities, having no longer to provide and maintain sewage works, would reduce their rates by the amount now being spent thereon.

One good result has ensued upon the discussion of these schemes. Each district is endeavouring to place itself outside by treating its sewage in a more efficient manner. This may serve for a few years, but ultimately a general scheme must be adopted, or the total expense which will have to be incurred by the separate districts will exceed the cost of such a scheme. However, until the most recent systems of sewage treatment have had a fair trial, the authorities concerned will not entertain a joint scheme. Yet I am of opinion, taking everything into consideration, the scheme I suggest would be cheaper than the existing systems, however modified. Sewage works will always be costly and troublesome to maintain, and the land necessary for each treatment will continually increase in value. By sending the raw sewage right away, this land would become available for other purposes.

#### DARIES, COWSHEDS, AND MILKSHOPS.

In nearly all reports it is stated that these are regularly inspected and found in a fairly satisfactory condition. There is little doubt, however, that the observations made by the Medical Officer of Health for Chelmsford Borough are correct, and that milk as generally supplied is an unclean article of diet. Dr. Klein has recently shewn how one of the



most, if not the most, typical of sewage organisms, can be detected in milk, and milk in which it is discoverable is not safe for human consumption. It is a very probable cause of infantile diarrhœa, and it is a question whether a milk containing this organism is of a quality which any purchaser would demand, and, if not, the seller would be liable to a penalty under the Sale of the Food and Drugs Act. It might be considered as unsound food, but unfortunately the detection of the organism takes at least 24 hours, and long before the milk can be examined it is sold, used, and the mischief done.

#### UN SOUND FOOD.

In only one or two districts is any systematic inspection made for the detection of unsound food. Several seizures were made in East Ham and in Walthamstow.

#### SALE OF FOOD AND DRUGS ACTS.

As some misconception appears to exist with regard to the the precise authority for taking samples, I may quote from a report on the subject, written by Dr. Kaye, the Medical Officer of Health for the West Riding of Yorkshire. He says: "The Special Inspectors of the County Council and Police Superintendents have power to purchase samples in most sanitary districts in the county, *but this is no hindrance to local action by the Sanitary Inspector.* Sanitary Inspectors are not officers under these Acts simply by virtue of their appointment as 'Inspectors of Nuisances,' though there is no doubt that every Sanitary Inspector ought to be in a position to give his attention to this important work. Sanitary Inspectors, when appointed or subsequently, should see that the resolution of their Sanitary Authority includes the execution of these Acts, and they should be provided with a certificate of such appointment signed by the Clerk, or under the seal of the Council. This being once procured, the

Inspector is at liberty to purchase samples when and where he sees fit (within his district), and without obtaining further special instructions at any time."

In East Ham, the Public Health Committee, feeling that the provisions of the Act were not being carried out in the district with that amount of energy which such important work demanded, empowered their Inspector to procure samples and submit them to the County Analyst. During the latter half of the year he purchased 36 samples, and 8 of these, upon analysis, proved to be adulterated. In Walthamstow also 36 samples were taken, and proceedings were taken against 6 persons for adulteration. Penalties were inflicted in every case.



# URBAN DISTRICTS.

## SUMMARY OF REPORTS OF SANITARY INSPECTIONS.

	Marking.	Brantree.	Brightlingsea.	Buckhurst Hill.	Burnham.	Clacton.	Chelmsford.	Chingford.	Colchester.	East Ham.	Epping.	Grays.	Halstead.	Harwich.	Ilford.	Leigh-on-Sea.	Leyton.	Malden.	Romford.	Saffron Walden.	Shoeburyness.	Southend-on-Sea.	Waltham Holy Cross.	Walthamstow.	Walton-on-the-Naze.	Wanstead.	Witham.	Woodford.	Wyvenhoe.			
1. Complaints received	160	...	...	42	6	24	84	30	504	452	41	31	14	No Report.			32	486	12	No Report.			14	22	196	410	132	6	38	51	13	
2. Nuisances detected	1146	...	102	267	...	91	951	76	532	5090	79	464	625	No Report.			764	...	57	No Report.			92	98	107	356	1673	8	45	74	70	
3. Nuisances abated	954	...	93	139	...	67	912	74	479	4731	74	439	600	No Report.			697	...	56	No Report.			92	98	270	369	1805	8	45	151	44	
4. Notices served	1146	...	...	15	8	91	468	76	522	2212	113	425	25	No Report.			153	2235	11	No Report.			51	98	259	128	39	35	45	57	9	
5. Summonses taken out	1	...	...	1	...	...	4	...	3	3	...	1	8	No Report.			3	...	1	No Report.			...	1	14	...	...	3	...	...	...	
6. Convictions	1	...	...	1	...	...	4	...	...	3	...	1	7	No Report.			3	...	1	No Report.			...	0	8	...	...	1	...	...	...	
7. Premises inspected	172	...	71	5	all	152	541	86	692	3400	340	1164	...	No Report.			1832	3209	132	No Report.			750	(75	720	411	2783	18	all	61	60	
8. Lodging-houses inspected	1	...	...	...	...	...	3	...	all	...	...	5	...	No Report.			...	...	...	No Report.			...	...	...	...	14	...	...	...	...	
9. Slaughter-houses inspected	4	...	...	3	...	3	8	2	all	11	4	8	12	No Report.			3	all	3	No Report.			7	2	106	4	19	3	2	8	1	
10. Bake-houses inspected	18	...	...	...	...	6	...	2	85	21	5	11	21	No Report.			14	all	...	No Report.			15	2	197	8	44	1	3	10	...	
11. Dairies and Milk Shops inspected	38	...	...	...	...	10	...	3	69	156	3	10	4	No Report.			41	...	...	No Report.			11	4	193	{ 10	29	4	12	16	...	
12. Cowsheds inspected	5	...	...	...	...	6	...	11	54	22	6	...	4	No Report.			14	...	2	No Report.			15	3	32	...	20	1	8	8	...	
13. Workshops inspected	...	...	...	...	...	...	...	...	76	29	0	12	20	No Report.			20	...	...	No Report.			3	0	...	...	121	3	...	...	...	
14. Filthy houses cleansed, sec. 47, Public Health Act, 1875	38	...	...	...	...	...	...	...	...	...	1	11	...	No Report.			...	...	...	No Report.			...	3	...	...	22	1	...	...	1	
15. Houses disinfected	203	...	...	21	8	6	4	11	650	711	3	40	10	No Report.			...	353	...	No Report.			8	6	226	36	455	7	35	34	8	...
16. Overcrowding abated	9	...	...	...	...	2	11	2	4	8	...	4	5	No Report.			5	...	...	No Report.			1	5	...	...	11	0	...	...	...	...
17. Houses placed in habitable repair	...	...	...	1	...	...	4	...	...	11	12	3	1	No Report.			34	216	...	No Report.			...	3	...	...	...	6	7	...	...	...
18. Houses closed	4	...	...	1	...	...	3	...	4	...	...	4	...	No Report.			16	...	...	No Report.			...	...	...	...	...	...	...	...	...	...
19. Houses erected or rebuilt for which "Certificates" were applied for	...	...	12	16	...	...	...	...	95	...	14	...	15	No Report.			...	...	6	No Report.			...	...	...	...	...	27	...	...	...	6

[illegible]



# RURAL DISTRICTS.

## SUMMARY OF REPORTS OF SANITARY INSPECTORS.

	Belchamp.	Eastern Division Billerica.	Braintree.	Bumpstead.	Chelmsford.	Dunmow.	Epping.	Halstead No. 1.	Halstead No. 2.	Lexden and Winstree.	Maldon (Dengie Division).	Maldon (Thurstable Division).	Ongar.	Orsett No. 1.	Orsett No. 2.	Rochford.	Romford No. 1.	Romford No. 2.	Saffron Walden.	Stanstead.	Tendring.
1. Complaints received	0	9	16	4	108	8	127	18	28	23	13	20		18	3	7	15	...	7	10	140
2. Nuisances detected	29	20	39	46	96	142	250	53	95	168	110	115		79	206	75	70	102	119	170	152
3. Nuisances abated	27	50	55	35	107	140	378	53	119	162	123	83		97	209	79	197	102	115	150	149
4. Notices served	29	20	13	53	80	85	268	12	41	67	121	29		42	202	79	104	102	82	10	163
5. Summonses taken out	1	...	0	...	...	1	1	0	...	1	3	1		...	6	1	4	...	1	...	3
6. Convictions	1	...	0	...	...	1	1	0	...	1	...	1		...	5	1	4	...	1	...	2
7. Premises inspected	396	250	293	100	650	...	350	247	185	747	...	476		132	309	103	54	all	821	430	523
8. Lodging-houses inspected	...	2	0	...	...	1	...	...	...	...	...	...		...	...	...	...	...	...	...	...
9. Slaughter-houses inspected	...	4	13	...	18	14	14	6	8	12	7	all		...	10	5	7	2	12	30	...
10. Bakehouses inspected	...	8	12	2	28	29	15	10	20	...	12	all		...	16	6	5	6	36	...	36
11. Dairies and Milk Shops Inspected	...	3	14	1	25	32	2	15	7	...	0	all		...	20	4	4	all	11	...	24
12. Cowsheds inspected	...	6	14	3	52	32	61	10	7	...	28	all		...	6	5	5	all	16	40	18
13. Workshops inspected	...	...	5	...	1	2	...	...	...	...	...	...		...	...	...	...	3	...	1	...
14. Filthy houses cleansed, sec. 46, Public Health Act, 1875	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...
15. Houses disinfected	...	...	...	...	...	2	7	...	...	...	1	...		...	4	...	...	...	...	...	2
16. Overcrowding abated	16	8	64	7	46	29	50	12	3	45	17	15		10	64	75	15	8	19	...	26
17. Houses placed in habitable repair	5	2	2	6	16	2	2	3	2	5	5	2		2	2	...	4	4	2	4	8
18. Houses closed...	3	1	6	...	65	2	6	1	6	14	2	...		24	40	6	6	4	9	10	19
	...	...	...	...	4	5	4	...	...	...	...	...		...	2	1	4	1	1	4	3

34. Name of Inspector	J. S. Robinson	H. J. E. Clark	E. H. Bright	W. H. Carr	I. C. Smith	J. Hamilton	J. H. Bell	H. W. Farrow	W. H. Edie	M. C. Warne	H. G. Keywood	J. Hurst	G. Watts	C. Judd	G. F. Hamilton	A. Cornell	W. Dickinson	E. T. Watts
19. Houses erected or re-built for which "Certificates" were applied for	2	...	4	2	42	6	46	5	5	15	31	2	40	...	107	...	2	17
20. "Certificates" granted	...	...	4	2	61	4	46	5	2	13	8	1	38	...	56	32	2	17
21. "Certificates" deferred	...	...	2	...	4	...	...	...	...	2	...	1	2	...	...	...	...	...
22. Wells sunk or improved supplies of water afforded	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23. Wells cleansed or repaired	2	...	7	...	3	3	17	...	6	19	2	...	4	2	...	...	1	1
24. Wells closed	4	6	2	2	4	2	6	4	1	30	9	...	6	3	...	8	36	...
25. Houses connected with sewers	...	...	...	...	...	...	...	...	...	...	0	...	4	1	1	4	...	...
26. Houses connected with water mains	...	...	34	...	23	...	...	1	5	2	8	21	36	7	...	2	...	3
27. Earth, pails, or improved Privies constructed, or existing privies altered	...	...	...	...	63	...	...	...	...	...	6	30	40	...	11	31	...	30
28. Privies and W.C.'s repaired; W.C.'s supplied with water	6	9	16	5	35	16	18	10	8	33	73	16	33	5	27	35	2	15
29. Cisterns cleansed, repaired, or covered	...	...	19	14	45	20	25	18	11	61	...	23	41	4	...	11	9	3
30. Animals improperly kept removed	...	...	...	...	12	...	2	17	...	...	...	15	19	...	...	28	...	...
31. Samples of water taken for analysis	...	...	2	3	...	33	4	1	...	21	...	1	3	...	7	2	3	...
32. Compensation paid for destruction of infected bedding	7	8	...	5	45	10	15	3	8	21	22	2	34	10	25	23	6	1
33. Seizures of unsound meat, etc.	...	...	...	...	...	...	...	1	...	...	...	...	...	...	£2	£3/10	...	...

\* For three months only.



## SECTION IV.

SUMMARY OF REPORTS OF MEDICAL OFFICERS  
OF HEALTH.~~~~~  
PORT SANITARY DISTRICTS.  
~~~~~

## HARWICH.

H. GURNEY, L.R.C.P., L.R.C.S., Medical Officer of Health.

No case of infectious sickness is known to have entered the port. Seven hundred and nine vessels were inspected, most of them from foreign ports. Only trivial defects were found. The Hospital Ships are in good repair, and ready for any emergency. The Port Sanitary Authority is strongly urged to adopt the Infectious Diseases Notification Act.

## COLCHESTER.

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

No case of infectious disease was imported during the year. The Hospital is in good condition, and ready to receive patients should the necessity arise. Four hundred and sixty-one vessels were inspected, and in most cases were found to be in a clean and satisfactory condition.

## MALDON.

H. L. BROWN, M.B., Medical Officer of Health.

The report runs as follows:—"Since March 25th, at which time I undertook the duties of Medical Officer of Health for the Port of Maldon, there have been no deaths on board in the district, and no case of infectious disease.

"Eight hundred and forty-seven vessels, with a tonnage of 39,182 tons, have entered the port during the past year. Of them 829 were coasters (36,882 tons), and 18 (2,300 tons) hailed from foreign ports. All vessels were inspected, the foreign vessels and a proportion of the coasters by myself.

"The only sanitary defects of note were on board manure smacks. These are generally in a filthy condition, and though the crews do not appear to suffer in health, their presence on the Quay gives rise to a serious nuisance. Some good has been done by urging greater attention to cleanliness on their masters. The new bye-laws framed by the Urban Sanitary Authority enforce the washing down of the Quays after discharge of such cargoes."

## URBAN SANITARY DISTRICTS.

### BARKING.

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

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 14,301                       |
| „ 1898                            | ... | ...           | ... | 20,000                       |
| Deaths registered in the district | ... | ...           | ... | 288                          |
| Corrections                       | ... | ...           | ... | + 33                         |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>16·0 | ... | 18·44                        |
| Zymotic Death-rate                | ... | 3·5           | ... | 3·7                          |
| Infantile Mortality               | ... | 180·          | ... | 151·                         |
| Birth-rate                        | ... | 36·2          | ... | 41·7                         |
| Zymotic Case-rate                 | ... | 9·9           | ... | 11·3                         |

*Water Supply.* The water supply from the South Essex Company is constant, but the Company now insist upon storage cisterns being provided. The cleansing of such cisterns is often neglected, and the Council is seeking power to enforce such



cleansing. It is pointed out that the water varies considerably from time to time and that the chlorides are increasing. The Council hopes to get the mains extended to Creeksmouth, but, as yet, the guarantee of 10 % on the total outlay for a term of years, as water-rate, required by the Water Company, has not been given.

*Food and Milk Supply.* A good deal of attention is being paid to this subject, and the Council hope to obtain power from the County Council to appoint their own Inspector, etc., under the Sale of Food and Drugs Act.

*Inspection of the District.* The results recorded shew that many defects were discovered and many remedied.

*The River Roding.* The foul condition of the river at Barking is graphically described. Last summer it was "a stinking sewer." The remedies suggested are :—

- (a) The improvement of the sewage effluents passing into the river.
- (b) The more frequent opening of the gates at the mill, so that the dammed-up sewage may get away with every tide.
- (c) The working of the disused water-wheels at the mill.
- (d) The construction of an intercepting sewer to carry all sewage effluents now draining into the Roding into the Thames.

*Sewerage.* The East Ham Works gives rise to a nuisance in summer. The water-courses on the Marshes become fouled. The sewage of Over-the-Gates passes into the river without treatment. The Kennedy Estate wants sewerage. Apparently these latter matters are receiving attention. The sewer ventilation generally has been improved, but more ventilating shafts might with advantage be added. Several groups of buildings and streets have been re-sewered.

*Chief Industries.* Many inhabitants are employed at the Gas Works, Manure Works, Tar Works, India Rubber Factory, etc. A large and increasing number of the population are workers from the Metropolis.

*Infectious Diseases.* No serious outbreak appears to have occurred during the year. A special report is presented on the excessive prevalence of Infantile Diarrhœa, and the Medical Officer of Health thinks that his investigations "demonstrate very clearly that overcrowding, gross sanitary defects in the dwellings, and neglect, by reason of the mothers being employed in factories, etc., are not the direct cause in many cases. Hand-fed children contributed 83·7 per cent. of the cases investigated. The other chief factors are, in his opinion, a polluted subsoil, and air fouled by emanations from the river, decomposing organic matter, etc. He recommends that hand-bills, stating the precautions to be taken in the rearing of hand-fed children, be widely circulated.

*Further Sanitary Requirements* are given as under :—

1. Much still remains to be done in re-laying and ventilation of drains and sewers in many parts of the town, in rendering many houses more habitable by paving round them, etc.
2. More ventilation to the public sewers and more stringent regulations as to the efficient ventilation of house drains and construction of manholes. Revision of Bye-laws on these matters.
3. Sanitary houses at a moderate rent for the labouring classes.
4. Fresh water supply for Creeksmouth.
5. Many additions needed to Isolation Hospital. It would be wise to make these additions in connection with a permanent scheme.
6. Public sanitary conveniences for both sexes are urgently needed in the centre of the town.



7. Arrangements should be made so that suspected cases of Diphtheria may be examined and Anti-diphtheritic Serum supplied by the Local Authority.

### BRAINTREE.

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

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 5,303                        |
| „ 1898                            | ... | ...           | ... | 5,400                        |
| Deaths registered in the district | ... |               |     | 73                           |
| Corrections                       | ... | ...           | ... | + 8 — 0                      |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>15.0 | ... | 16.4                         |
| Zymotic Death-rate                | ... | 2.0           | ... | 1.3                          |
| Infantile Mortality               | ... | 110.          | ... | 113.                         |
| Birth-rate                        | ... | 21.8          | ... | 23.0                         |
| Zymotic Case-rate                 | ... | 17.2          | ... | 3.4                          |

This report contains no reference to the sanitary condition of the town beyond the statement that “the milkshops, slaughter-houses, and bakehouses visited were found in much the same condition as usual,” and “Scavenging was undertaken by the Board, but there are still many houses without ash-pits.”

There was an epidemic prevalence of Scarlet Fever, and many cases of Diphtheria. “Altogether,” says the Medical Officer of Health, “there has been a great deal of epidemic disease.” The compulsory notification of Measles is recommended.

### BRIGHTLINGSEA.

Medical Officer of Health—H. S. COOPER, L.R.C.P.,  
M.R.C.S., L.S.A.

|                                   |     |     |     |         |
|-----------------------------------|-----|-----|-----|---------|
| Population, 1891                  | ... | ... | ... | 3,882   |
| „ 1898                            | ... | ... | ... | 4,295   |
| Deaths registered in the district | ... |     |     | 54      |
| Corrections                       | ... | ... | ... | + 1 — 2 |

|                          | 1898. | 1897. |
|--------------------------|-------|-------|
| Corrected Death-rate ... | 12·3  | 12·3  |
| Zymotic Death-rate ...   | 1·16  | ·0    |
| Infantile Mortality ...  | 93·2  | 98·0  |
| Birth-rate ...           | 27·4  | 31·14 |
| Zymotic Case-rate ...    | 2·5   | 5·4   |

*Isolation Hospital.* The Council is negotiating for the purchase of a site.

*Water Supply.* A deep boring is being made into the chalk in order to obtain a public supply.

*Sewerage.* The scheme prepared by the Engineers consulted has now been approved by the Local Government Board. The sewage will be purified by precipitation and filtration and discharged from an outfall at a point where current experiments have proved that it will be carried out to sea. No injury to the oyster layings will then be possible.

*Regulation of Dairies and Cowsheds.* A code of regulations are being considered with the view to their adoption.

*Diseases Prevalent.* The only infectious diseases of epidemic prevalence were Whooping Cough and Chicken Pox. The former caused four deaths.

## BUCKHURST HILL.

Medical Officer of Health—A. AMBROSE, M.D., D.P.H.

|                                       |                             |
|---------------------------------------|-----------------------------|
| Population, 1891 ...                  | 4,130                       |
| „ 1898 ...                            | 4,700                       |
| Deaths registered in the district ... | 50                          |
| Corrections ... + 3 — 4               |                             |
|                                       | Mean of 2 years,<br>1896-97 |
| Corrected Death-rate ...              | 1898. 10·4 ... 11·9         |
| Zymotic Death-rate ...                | ·0 ... 2·5                  |
| Infantile Mortality ...               | 151· ... 96·6               |
| Birth-rate ...                        | 21·0 ... 24·0               |
| Zymotic Case-rate ...                 | 5·7 ... 5·5                 |



The year has been exceptionally healthy, but the "death-rate for those under five years is still higher than it should be."

The system of sewer ventilation has been improved, and at the sewage works tanks have been prepared for bacterial filtration. The Medical Officer of Health thinks that the tank effluent turned over sufficient land will effect a solution of the vexed question of sewage disposal.

The water supply from the East London Water Company has been of a satisfactory quality.

An outbreak of Typhoid Fever occurred in September. Seventeen cases occurred. All the patients recovered. "All the cases occurred in the same part of the district, and although it has not been possible to ascertain the cause of the outbreak, yet it is reasonable to suppose that it was of a local nature; and the prompt removal of infected cases (to a temporary hospital) from surroundings favourable to the growth of the disease, in my opinion, prevented a formidable outbreak."

The Medical Officer, referring to this outbreak, says:—"I have several times called your attention to the present arrangement for the isolation of infectious diseases, and have suggested your making arrangements with adjoining Urban Districts for a joint hospital scheme; and the total breakdown of the present arrangement, before any strain was put on it, shows that it will be necessary for you to make some sort of fresh provision whereby you will be sure of accommodation when you require it, and I suggest, as I did some years ago, that a combination with the adjoining Urban Districts is at once the best, and the cheapest. At all events, it is not satisfactory that you should only be in the position of having your cases received at Epping *if there is room.*"

*Inspection.* A portion of the district has been inspected from house to house and a large number of nuisances were detected, some of which are not yet abated.

## BURNHAM.

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

|                                   |     |     |     |               |
|-----------------------------------|-----|-----|-----|---------------|
| Population, 1891                  | ... | ... | ... | 2,476         |
| „ 1898                            | ... | ... | ... | 2,576         |
| Deaths registered in the district | ... | ... | ... | 40            |
| Corrections                       | ... | ... | ... | — 2 + 0?      |
| Corrected Death-rate              | ... | ... | ... | 1898.<br>14·8 |
| Zymotic Death-rate                | ... | ... | ... | ·6            |
| Infantile Mortality               | ... | ... | ... | —             |
| Birth-rate                        | ... | ... | ... | —             |
| Zymotic Case-rate                 | ... | ... | ... | 5·2           |

This district obtained Urban Powers during the year, having previously formed a portion of the Maldon Rural District. The Birth-rate and Infantile Mortality are not given, as the necessary returns could not be obtained from the Registrar.

The inspection of the town has led to the discovery of a great number of insanitary conditions which require the prompt attention of the Council.

*Water Supply.* Derived from two tube wells. Yield about 30,000 gallons per day, or 11·6 gallons per person. The supply is constant, but the pumps require duplicating.

*Sewerage System.* “The tanks are too near the town, and the present system requires abolishing.” “Burnham depending largely upon oysters for its wealth, it is of the utmost importance that the fluid discharged into the river should be as pure as it can possibly be made.” Of 634 W.C.’s, only 160 are supplied with water.

*Scavenging.* Done by contract. The ash-pits are emptied once a fortnight.

*The River Crouch.* Suffers from little pollution in its whole extent, other than the sewage outfall. The condition of the mud at the outfall is very filthy.



*Building and other Bye-laws* have been adopted.

*Inspection.* Every house has been inspected and reported on. There is no Isolation Hospital.

### CLACTON.

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

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 3,584                        |
| „ 1898                            | ... | ...           | ... | 6,002                        |
| Deaths registered in the district | ... | ...           | ... | 89                           |
| Corrections                       | ... | ...           | ... | + 4 — 16                     |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>12·8 | ... | 14·5                         |
| Zymotic Death-rate ...            | ... | 3·16          | ... | 2·1                          |
| Infantile Mortality ...           | ... | 140·          | ... | 109·                         |
| Birth-rate ..                     | ... | 26·15         | ... | 29·8                         |
| Zymotic Case-rate ..              | ... | 5·8           | ... | 12·6                         |

*Water Supply.* The Council has recently purchased the undertaking of the Water Company and proposes to obtain a supply from a deep well in the chalk. For this purpose, a trial bore has been made at Great Bentley, and the results are said to be satisfactory.

*Scavenging.* “The existence of nasty ash-pits at the backs of houses is objectionable.” The Medical Officer of Health recommends their abolition, and that the scavenging should be done by the Council.

*Bye-laws.* These are framed on the Local Government Board model. The Council are apparently dissatisfied with them, but the Medical Officer of Health points out that they were framed to protect the public and future owners and occupiers, and that it never was intended that they should be construed “as it might suit any person, be he Surveyor, or Builder, or Owner.” The Medical Officer of Health, however, thinks that it is unnecessary to lay the drains on a bed of concrete save under special circumstances.

*Drain-testing.* The Council has wisely decided to apply the water test to all drains before allowing them to be covered in, and to apply the smoke test to all soil pipes.

A loan has been obtained for providing a Town Yard and Mortuary and Ambulance Shed.

Sanitary Conveniences have been erected on the West Cliff, and at the end of West Avenue. Several new roads have been made up.

The sea-water scheme has been completed, and sea-water can now be drawn from a number of stand-pipes.

An Isolation Hospital is to be erected at Rush Green, and a public enquiry has been held for permission to borrow the money required.

Bye-laws have been adopted for the regulation of dwellers in tents, vans, etc.

## CHELMSFORD.

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

|                                   |     |       |     |                              |
|-----------------------------------|-----|-------|-----|------------------------------|
| Population, 1891                  | ... | ...   | ... | 11,008                       |
| „ 1898                            | .   | ...   | ... | 11,997                       |
| Deaths registered in the district | ... | ...   | ... | 206                          |
| Corrections                       | ... | ...   | ... | + 0 — 46                     |
|                                   |     | 1898. |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ..  | 13·3  | ... | 14·8                         |
| Zymotic Death-rate                | ..  | 1·5   | ... | 1·7                          |
| Infantile Mortality               | ... | 80·0  | ... | 102·                         |
| Birth-rate                        | ... | 27·1  | ... | 26·1                         |
| Zymotic Case-rate                 | ... | 3·0   | ... | 8·3                          |

No serious epidemic occurred during the year. With reference to the Isolation Hospital, the Medical Officer of Health says :—“ I regret extremely that I have again to call



the attention of the Sanitary Committee to this building, which is called the Borough Infectious Hospital. As I reported last year, and the year before, it is absolutely unfit for the purpose."

*Water Supply.* "I consider that the question of increasing the supply of water to the Borough is perhaps the most urgent sanitary question at the present time before the Council." 50 per cent. of the water closets are not supplied with water. If the present rate of building goes on the water supply in the summer months will be very limited indeed. The chief supply is from two springs in the immediate vicinity of the town.

*The River Cann.* During October the river was polluted by an influx of sewage from the village of Writtle.

*House-to-house Inspection.* An unavoidable delay occurred in this work, but it is again being pushed forward. Water closets without water laid on are the chief cause of nuisance. Some cases of overcrowding were detected and have been abated.

## CHINGFORD.

Medical Officer of Health—S. T. TAYLOR, M.B.

|                                   |     |       |             |                              |
|-----------------------------------|-----|-------|-------------|------------------------------|
| Population, 1891                  | ..  | ..    | ...         | 2,737                        |
| „ 1898                            | ... | ...   | ...         | 3,682                        |
| Deaths registered in the district | ... |       |             | 35                           |
| Corrections                       | ... | ...   | ... + 4 — 3 |                              |
|                                   |     | 1898. |             | Mean of 3 years,<br>1895-97. |
| Corrected Death-rate              | ..  | 9·8   | ...         | 10·8                         |
| Zymotic Death-rate ..             | ... | 1·35  | .           | 2·2                          |
| Infantile Mortality ..            | ... | 88·   | ...         | 87·                          |
| Birth-rate ...                    | ... | 24·7  | ...         | 24·6                         |
| Zymotic Case-rate ..              | ... | 5·4   | ...         | 4·4                          |

Measles was the only disease which became epidemic during the year, causing the National and Infants' Schools to be closed for a period of three weeks.

An arrangement has been made for admitting patients into the Epping Rural District Hospital, *provided there is room*. A sum of £25 has to be paid annually, and an additional charge varying from 7/6 to 17/6 per day for each patient sent in. The Medical Officer of Health remarks:—"One of the chief disadvantages of small Isolation Hospitals is that the administrative charges must of necessity be much higher than in larger institutions."

*Drainage.* The drainage scheme at Chingford Hatch has not yet been carried out, in consequence of objections on the part of the Local Government Board. The insanitary condition of this portion of the district, it is said, would "be difficult to exaggerate."

*Lea Valley Drainage Scheme.* This scheme has received the sanction of the Council, since the present arrangements for sewage disposal are very likely to prove quite inadequate as the population of the district increases.

*Proposed Waterworks Reservoir on Chingford Marsh.* Objections are raised to the site of this reservoir, since the Council would be debarred from acquiring land on the Marsh for a subsidiary sewage farm there for the Low Street district, and because the natural drainage of the district would be interfered with.

*Scavenging.* Fewer complaints are now received than formerly.

*Inspections.* These have been made by the Medical Officer of Health and by the Sanitary Inspector. Many nuisances were detected and nearly all have been abated.

## COLCHESTER.

Medical Officer of Health—G. BROWN, M.D.

|                                   |     |     |     |          |
|-----------------------------------|-----|-----|-----|----------|
| Population, 1891                  | ... | ... | ... | 34,559   |
| „ 1898                            | ... | ... | ... | 40,710   |
| Deaths registered in the district | ... |     |     | 625      |
| Corrections                       | ... | ... | ..  | + 1 — 25 |



|                      |        |      |     | Mean of 8 years,<br>1890-97. |
|----------------------|--------|------|-----|------------------------------|
|                      |        |      |     | 1893.                        |
| Corrected Death-rate | ...    | 14.7 | ... | 15.8                         |
| Zymotic Death-rate   | ...    | 2.7  | ... | 1.5                          |
| Infantile Mortality  | ...    | 138. | ... | 134.                         |
| Birth-rate           | ... .. | 23.8 | ... | 27.0                         |
| Zymotic Case-rate    | ... .. | 4.7  | ... | 8.6                          |

The Infectious Hospital has been much improved, by the addition of a ward and laundry block.

*Drainage.* For the last six months all new drains have been submitted to the water test, 122 new houses have been erected and 220 buildings have been connected with the sewers.

*Water Supply.* The artesian well water is now being supplied exclusively, and is constant.

*Inspection.* 692 houses were inspected and 532 nuisances detected or reported. Of these 479 have been abated. The following Table given by the Inspector is interesting.

*Drain-testing shewing locality of sewer-gas escapes.*

|                                                        |    |
|--------------------------------------------------------|----|
| Into breakfast, sitting or dining room                 | 4  |
| Into house from rat holes                              | 6  |
| Into kitchens and sculleries                           | 6  |
| Into basement kitchens and cellars                     | 8  |
| Into pantries                                          | 5  |
| Into internal W.C's.                                   | 8  |
| Into external W.C's.                                   | 57 |
| Into workrooms                                         | 3  |
| Into rain-water cistern                                | 1  |
| From defective drains                                  | 27 |
| From heads and joints of rain-water and<br>vent. pipes | 25 |
| From joints of external soil pipes                     | 5  |
| From joints of internal soil pipes                     | 2  |
| From defective traps in yard                           | 2  |

The Inspector of workshops has visited over 800 premises and 223 defects found.

The Inspector says "there is now a far more intelligent interest taken in the domestic workshops by the occupiers thereof than ever before in the matter of cleanliness and limewashing."

Dr. Brown after referring to a number of minor matters requiring attention adds: "The state of the river requires your attention, and if a plan of entirely freeing it from any contamination be carried through it will be a great advantage to the riparian inhabitants." A new ambulance is required and a mortuary for the hospital.

### EAST HAM.

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

|                                   |        |               |     |                              |
|-----------------------------------|--------|---------------|-----|------------------------------|
| Population, 1891                  | ...    | ...           | ... | 32,710                       |
| „ 1898                            | ...    | ...           | ... | 70,000                       |
| Deaths registered in the district | ...    |               |     | 964                          |
| Corrections                       | ...    | ...           | ... | + 40 — 0                     |
|                                   |        |               |     | Mean of 8 years,<br>1890-97. |
| Uncorrected Death-rate            | ...    | 1898.<br>13·7 | ... | —                            |
| Corrected Death-rate              | ...    | 14·3          | ... | 14·2                         |
| Zymotic Death-rate                | ...    | 2·7           | ... | 2·6                          |
| Infantile Mortality               | ..     | 163·          | ... | 139·                         |
| Birth-rate                        | ... .. | 37·3          | ... | 36·2                         |
| Zymotic Case-rate                 | ... .. | 13·2          | ... | 10·6                         |

It is very probable that the estimated population given above is much below the actual figure. At the end of the year the Medical Officer of Health thinks it is nearer 80,000.

*Water Supply.* This is from the East London Mains. During the drought the supply for a time was limited to six hours daily.

*Sewerage.* The two outfall sewers serve the Northern and Southern portions respectively of the district and meet at the pumping station at Bonny Downs where it undergoes a chemical treatment, subsequent filtration before being admitted into the Creek.



*Inspections.* An assistant Inspector has been appointed. 3751 primary inspections were made and in 72 per cent. of the premises, defects were found. Altogether over 5,000 nuisances were discovered "the nature of which manifests the need of the house-to-house inspections which have been systematically carried on in many parts of the district." The general condition of the dairies and cowsheds is satisfactory. Slaughter-houses are periodically examined.

*Offensive Trades.* A fellmonger commenced business in the Manor Park Ward, but the Council promptly caused its removal. Two fish-skin scraping business were set up. Both created nuisances, prosecutions were instituted and fines imposed.

*Factories and Workshops Acts.* The workshops examined were as a rule found in fair condition.

*Unsound Food.* On six occasions unsound food has been discovered and destroyed. Several trucks of fish and barrels of crabs were destroyed at the owners' request.

*Gipsies and Tent Dwellers* are giving a good deal of trouble on account of the close proximity to London.

*Removal of House Refuse.* The Council employs 14 carts and 20 men and the work has proceeded satisfactorily. The phenomenal growth of the district puts a great tax on the department. Many householders give trouble by refusing to place the dust outside for the dustmen. Most of the refuse is deposited at the sewage works.

*Sale of Food and Drugs Act.* In May last the Public Health Committee, feeling that the provisions of this Act were not being carried out with that amount of energy which such important work demanded, instructed the chief Sanitary Inspector to procure samples and submit the same for analysis. From that date to Dec. 31st, 36 samples were taken and 8 proved to be adulterated.

## EPPING.

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

|                                   |     |       |     |          |
|-----------------------------------|-----|-------|-----|----------|
| Population, 1891                  | ... | ...   | ... | 3,318    |
| „ 1898                            | ... | ...   | ... | 3,396    |
| Deaths registered in the district | ..  |       |     | 66       |
| Corrections                       | ... | ..    | ... | — 22 + 1 |
|                                   |     | 1898. |     | 1897.    |
| Corrected Death-rate              | ... | 13·2  | ... | 19·5     |
| Zymotic Death-rate                | ... | 1·1   | ... | 2·6      |
| Infantile Mortality               | ..  | 96·8  | ... | 83·      |
| Birth-rate                        | ... | 27·3  | ... | 24·8     |
| Zymotic Case-rate                 | ..  | 5·5   | ... | 10·9     |

Several portions of the district have been systematically inspected.

*Drainage.* The drainage of some of the worst courts and alleys has been improved, but there has been great opposition, the Council having in many cases to do the work and recover the costs from the owners. There is still much to be done in this direction, and the Council intend insisting upon the requirements of the Public Health Act being complied with.

*Water Supply.* Although many notices have been served to lay on the water from the public supply, many owners have not complied therewith, and further action will have to be taken. The drought caused an increased demand on the Essex and Herts Company's supply, which caused inconvenience to those not having cisterns.

*Roads.* Hemnall Street has been "made up," but passing the Rookery stagnant pools, mud, manure and refuse are found in the roadway.

*Sewerage.* Sewers are required for the Station Road and Kendall Estate, and the drainage of Ivy Chimneys and Allnutt's Estate is at present in a most unsatisfactory state. Some delay has arisen with reference to the construction of the new sewer-



age works for the southern side of the district. The shortness of water caused sewer flushing and road watering to be discontinued for a time. At the sewage farm the ground became cracked, and much of the sewage escaped in a crude state into the Cobbin Brook. As there was no water in the Brook, a nuisance was caused which will recur unless steps are taken to prevent it.

*Housing of the Working Classes.* This continues to be a source of trouble, and it is a serious question whether the Council should not endeavour to supply cottages under the Housing of the Working Classes Act.

*Hospital Accommodation.* The arrangement with the Rural District Council has come to an end, and the erection of a Wood and Iron Hospital is recommended. But whether this be decided upon, or whether the Council decides to combine with one or more of the neighbouring districts, "no time should be lost in the matter, which is one that may become painfully urgent at any moment."

*Infectious Diseases.* Two outbreaks of Measles occurred during the year, and three Schools had to be closed. This action undoubtedly arrested the epidemics.

## GRAYS.

Medical Officer of Health—S. H. SNELL, M.D., D.P.H.

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 12,087                       |
| „ 1898                            | ... | ...           | ... | 14,750                       |
| Deaths registered in the district | ... | ...           | ... | 151                          |
| Corrections                       | ... | ...           | ... | + 0 — 0                      |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>10·2 | ... | 14·5                         |
| Zymotic Death-rate                | ... | 2·17          | ... | 2·6                          |
| Infantile Mortality               | ... | 145·          | ... | 132·                         |
| Birth-rate                        | ... | 27·6          | ... | 35·7                         |
| Zymotic Case-rate                 | ... | 7·6           | ... | 11·5                         |

*Inspections.* Practically the whole district has been inspected by the Medical Officer of Health and Inspector.

*Sewage Works.* There is still an occasional complaint of smells arising from these works. Lime is not now used as a precipitant, as it was found to corrode the valves of the pump. Alumino-ferric is used alone.

*Water Supply.* The supply is said to be constant and good, though hard.

## HARWICH.

Medical Officer of Health—HAROLD GURNEY,

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

|                                   |     |       |     |                              |
|-----------------------------------|-----|-------|-----|------------------------------|
| Population, 1891                  | ... | ...   | ... | 8,403                        |
| „ 1898                            | ..  | ...   | .   | 8,703                        |
| Deaths registered in the district | ... |       |     | 125                          |
| Corrections                       | ... | ...   | ... | + 8                          |
|                                   |     | 1898. |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 15·3  | ..  | 14·9                         |
| Zymotic Death-rate                | ... | 2·6   | ... | ·99                          |
| Infantile Mortality               | ... | 129·  | ..  | 134·6                        |
| Birth-rate                        | ... | 34·7  | ... | 33·3                         |
| Zymotic Case-rate                 | ..  | 3·9   | ... | 8·2                          |

*Drainage and Sewerage.* There is an absence of drainage at Upper Dovercourt and the Medical Officer of Health suggests that steps should be taken to remedy the serious condition of affairs that exists in that neighbourhood.

*Slaughter Houses.* A special report was presented during the year on the condition of the slaughter-houses in the Borough. Since then the bye-laws have been enforced and the places are under better control. The offal, etc., is not deposited in the sewer as heretofore.

*Closet Arrangements.* A sweeping reform has been effected at Bathside, 183 privies having been abolished and water closets substituted.



*Infectious Diseases.* The Infants School had to be closed on account of an outbreak of measles.

### HALSTEAD.

Medical Officer of Health—C. G. ROBERTS, M.B.

|                                   |     |     |          |
|-----------------------------------|-----|-----|----------|
| Population, 1891                  | ..  | ... | 6,056    |
| „ 1898                            | ... | ... | 6,300    |
| Deaths registered in the district | ... | ... | 122      |
| Corrections                       | ... | ... | — 18 + 0 |

|                      | 1898. | Mean of 8 years,<br>1890-97, |
|----------------------|-------|------------------------------|
| Corrected Death-rate | 16.5  | 16.7                         |
| Zymotic Death-rate   | 1.26  | 1.9                          |
| Infantile Mortality  | 144.  | 103.                         |
| Birth-rate           | 23.0  | 25.1                         |
| Zymotic Case-rate    | 4.1   | 8.7                          |

German Measles became prevalent in the spring and was followed by ordinary Measles in the Autumn. Children were found at the schools with “the rash full out on their faces” Several cases of Typhoid Fever and Diphtheria occurred connected with sanitary defects.

*Forms of Closets.* The following table shows that much has been done recently to diminish the risk caused to the community from the supply of water to closets direct from the main, either by means of ordinary stool cock or so called “Levers.”

| Forms of Closet. | 1894. | 1899. |
|------------------|-------|-------|
| Lever            | 218   | 94    |
| Stool Cock       | 105   | 46    |
| Cistern          | 278   | 858   |
| Handflush        | 292   | 304   |
| Goux             | 87    | 25    |
| Pail             | 36    | 46    |
| Privy            | 167   | 56    |

The dangerous forms have been reduced about 50 cent. and the Medical Officer of Health hopes to see them abolished altogether by the end of the present year.

*Sewage Farm.* The increased number of closets connected with the sewers add considerably to the amount of sewage to be treated at the farm, and the Medical Officer of Health thinks that pressure should be brought to bear upon the County Council to provide surface drainage for the roads. This would relieve the farm and minimise the risk of sewage polluted storm water overflowing from the farm into the river.

*Water Supply.* The flushing of the mains is advocated to wash out the rust which forms therein and causes the water at times to be turbid and unsightly.

*Inspections.* As the result of inspections a total of 600 nuisances were abated during the year.

## ILFORD.

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

|                  |     |     |     |        |
|------------------|-----|-----|-----|--------|
| Population, 1891 | ... | ... | ... | 10,913 |
| „ 1898           | ... | ... | ... | 27,178 |

(Does not include the Claybury Asylum and Dr. Barnardo's Homes.)

|                                   |     |           |
|-----------------------------------|-----|-----------|
| Deaths registered in the district | ... | 535       |
| Corrections                       | ... | — 271 + 8 |

|                      |     | 1898. | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|------------------------------|
| Corrected Death-rate | ... | 10·2  | 12·3                         |
| Zymotic Death-rate   | ... | 2·2   | 2·2                          |
| Infantile Mortality  | ... | 153·  | 127·                         |
| Birth-rate           | ... | 25·7  | 30·                          |
| Zymotic Case-rate    | ... | 7·4   | 11·0                         |

In the statistical returns for this district the population of Claybury Asylum (2,800) and of Dr. Barnardo's Home (1,000) are not included. During the year there were 264 deaths in the Asylum and 7 in Dr. Barnardo's Home.



*Isolation Hospital.* The new Hospital was completed and opened in November last.

*Infectious Diseases.* Measles was epidemic during the first half of the year. The disease is notifiable in Ilford and 425 cases were notified. Amongst these there were five deaths.

*The River Roding.* During the summer-time the river was practically an open sewer.

*Housing of the Working Classes.* Several houses (10) have been demolished, others placed in habitable repair, and others (8) closed.

*Ditches.* The ditch in Bennet's Castle Lane remains in a very filthy condition.

*Water Supply.* The inhabitants were put to great inconvenience in the summer-time "by the breakdown of the East London Water Company" and by the only partial supply of the South Essex Water Company.

*The Sewage Works.* The outfall works have been completed. Cress from the beds along the bank of the Roding was forbidden to be sold, as they had been flooded by the river.

## LEIGH-ON-SEA.

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

L.R.C.P.

|                                   |      |       |     |         |
|-----------------------------------|------|-------|-----|---------|
| Population, 1891                  | ...  | ...   | ... | 2,108   |
| „ 1898                            | ...  | ...   | ... | 3,750   |
| Deaths registered in the district | ...  | ...   | ... | 56      |
| Corrections                       | .... | ...   | ... | — 1 + 1 |
|                                   |      | 1898. |     | 1897.   |
| Corrected Death-rate              | ...  | 14·9  | ... | 14·7    |
| Zymotic Death-rate                | ...  | 3·5   | ... | 4·2     |
| Infantile Mortality               | ...  | 147·  | ... | 92·     |
| Birth-rate                        | ...  | 27·2  | ... | 24·6    |
| Zymotic Case-rate                 | ...  | 16·2  | ... | 14·1    |

The population of this district continues to increase and is now estimated at 3,750. The infantile mortality is high on account of the excessive number of deaths which occurred within a few days of birth.

*Infectious Diseases.* Diphtheria was very prevalent during the year, and a special report thereon was prepared.

*Inspection.* A systematic inspection has been carried on, and shewed that there were very many serious sanitary defects, some of which cannot be effectually remedied until a new sewerage scheme has been completed.

*Sewerage Scheme.* This has been prepared by an eminent firm of engineers, and includes bacterial filters, etc. The outfall will be into the Thames.

*Isolation Hospital.* A site has been selected.

*Bill before Parliament.* A Bill enabling the Council to borrow money for works of sewerage, drainage, etc., and for an Isolation Hospital, has been deposited. (This has since passed through both Houses of Parliament.)

*Water Supply.* This is from a deep well belonging to the Council. The water has been examined recently and found most satisfactory.

The Medical Officer of Health concludes :—"The past year has been one which from a sanitary point of view leaves much to be desired, but on the whole compares favourably with the preceding one, and by the work done in it prepares the way for better things in years to come."

## LEYTON.

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

|                  |     |     |     |        |
|------------------|-----|-----|-----|--------|
| Population, 1891 | ... | ... | ... | 63,056 |
| „ 1898           | ... | ... | ... | 90,000 |

(This does not include Public Institutions, which have a population of 2,380.)

|                                   |        |            |
|-----------------------------------|--------|------------|
| Deaths registered in the district | ...    | 1,627      |
| Corrections                       | ... .. | — 560 + 86 |



|                                | 1898. | Mean of 8 years,<br>1890-97. |
|--------------------------------|-------|------------------------------|
| Partially Corrected Death-rate | 12.5  | ...                          |
| Corrected Death-rate ...       | 12.9  | 13.8                         |
| Zymotic Death-rate ...         | 2.8   | 2.6                          |
| Infantile Mortality ...        | 150.  | 137.                         |
| Birth-rate ...                 | 28.4  | 32.4                         |
| Zymotic Case-rate ...          | 7.8   | 13.0                         |

The Medical Officer of Health, in estimating his Death-rate, excludes 28 deaths which occurred from injuries and does not add 11 deaths which occurred outside the district amongst persons belonging thereto. When these are added the rate is increased from 12.5 to 12.9.

*The Temporary Isolation Hospital.* A disastrous fire occurred in the Laundry Block, and the Discharging Room was damaged. The Laundry Block has been rebuilt in brick and the electric light is to be installed in the Wards, thus minimising the risk of fire. A new Ambulance has been purchased, and it is intended to install a disinfecting apparatus.

*Infectious Diseases.* Measles became epidemic in March, and was followed, as is often the case, by an outbreak of Whooping Cough. An epidemic of Diarrhœa commenced rather suddenly in August, and during that and the following month caused 117 deaths. Leaflets were distributed giving advice to parents.

*Inspections.* Over 3,000 inspections were made and over 2,000 nuisances detected. Dairies, Cowsheds, Slaughter-houses and Bakehouses are reported to be in a satisfactory condition.

*Water Supply.* The long-continued drought resulted in the gradual depletion of the reservoir of the East London Company and caused a vast amount of inconvenience throughout the district. On Sept. 9th the houses along several roads were found to be without water and the storage cisterns were empty, pointing to the fact that the supply must have been cut off some considerable time before that date. Upon communicating with the Water Company a supply was promptly provided. Other

similar complaints were received, but apparently a representation to the Company invariably received prompt attention. No nuisance was directly traceable to the scarcity.

*Treatment of Sewage.* The Medical Officer and other officials and members of the Council have during the year visited different places to inspect systems of sewage treatment, apparently with the view of adopting some fresh process for the purification of the sewage of the district.

### MALDON.

Medical Officer of Health—H. R. BROWN, M.B., C.M.

(1st April to December 31st.)

|                                   |     |       |     |                  |
|-----------------------------------|-----|-------|-----|------------------|
| Population, 1891                  | ... | ...   | ... | 5,383            |
| „ 1898                            | ..  | ...   | ... | 5,729            |
| Deaths registered in the district | ... |       |     | 82               |
| Corrections                       | ... | ...   | ... | — 19 + 0         |
|                                   |     |       |     | Mean of 8 years, |
|                                   |     | 1898. |     | 1890-97.         |
| Corrected Death-rate              | ... | 14.6  | ... | 17.3             |
| Zymotic Death-rate                | ... | 1.6   | ... | 1.9              |
| Infantile Mortality               | ... | 148.  | ... | 111.5            |
| Birth-rate                        | ... | 27.0  | ... | 25.8             |
| Zymotic Case-rate                 | ... | 2.1   | ... | 7.7              |

Dr. Brown succeeded Dr. Guttridge as Medical Officer of Health in March last, and the statistics are based upon returns for 9 months only.

The above estimate of the population is based upon the “natural increase” or excess of births over deaths. It is probably, therefore, over-estimated.

*Drainage.* The most obvious sanitary defect in the Borough is the excessively offensive smells from the drains. This is due to inefficient ventilation and want of flushing. Where flushing tanks have been fixed a marked improvement has been effected.



*Closets and Ash-pits.* "It is also to be desired that the remaining privies and pail closets in the town be done away with as quickly as possible. This work is being steadily proceeded with, 34 of them having been changed to W.C.'s during the year. Much, however, remains to be done. It is noteworthy that out of the six cases of Enteric Fever notified during the past year, five occurred in Church Street and North Street, where the ground in the back yards is to a large extent saturated with sewage from privies and cesspits. There is no regular system of emptying ash-pits, and nuisances arising from accumulations of refuse are often found. The desirability of the Council undertaking the removal of such refuse is insisted upon.

*Water Supply.* The supply being intermittent and the houses (and cisterns) being at widely different levels, many of the higher houses were often without water last summer. The works, however, are passing into the hands of the Council, and it is hoped that a more abundant supply will be provided. Fambridge Road is not supplied from the main, but by a public pump. This yields a water which has been found to be sewage polluted, and a notice board to that effect has been erected. The Cromwell Spring is too near one or more cess-pools. Notwithstanding this, it continues to be used.

*Manure Nuisances.* The nuisances caused by the unloading and carting of London Manure has caused the Council to frame a series of Bye-laws to regulate this traffic. These are now in force.

*Bacteriological Laboratory.* The Medical Officer of Health has equipped a small laboratory for work in connection with matters relating to Public Health.

*Isolation Hospital.* Details of a scheme for the provision of a permanent Hospital for the joint use of the Maldon Urban and Rural Districts are still under discussion.

*Inspection.* Only 132 cottages have been inspected during the year.

## ROMFORD.

Medical Officer of Health—ALFRED WRIGHT, M.R.C.S.

|                                   |     |       |     |                  |
|-----------------------------------|-----|-------|-----|------------------|
| Population, 1891                  | ... | ...   | ... | 8,408            |
| „ 1898                            | ... | ...   | ... | 10,500           |
| Deaths registered in the district | ... |       |     | 226              |
| Corrections                       | ..  | ...   | ... | — 66 + 0         |
|                                   |     |       |     | Mean of 8 years, |
|                                   |     | 1898. |     | 1890-97.         |
| Corrected Death-rate              | ... | 15·2  | ... | 14·4             |
| Zymotic Death-rate                | ... | 4·6   | ... | 1·8              |
| Infantile Mortality               | ... | 177·  | ... | 110·             |
| Birth-rate                        | ... | 28·5  | ... | 32·9             |
| Zymotic Case-rate                 | ... | 9·1   | ... | 14·2             |

The very excessive mortality from zymotic disease was due to the prevalence of autumnal diarrhœa, which caused 33 deaths. This is about three times the average for the district

*Isolation Hospital.* The Urban and Rural Councils have combined and formed a joint Hospital district, and plans for the Hospital have been prepared and its erection decided upon. Meanwhile, by arrangement, cases are sent to the Ilford Hospital.

*Inspections.* These have been made periodically, and the Slaughter-houses and Bakehouses were found in a satisfactory condition.

*Water Supply.* A few private wells have been condemned and the South Essex Company's water laid on to the premises.

*Hand-flushed Water Closets.* The Medical Officer of Health again directs attention to the danger arising from so many Closets being unprovided with any arrangement for flushing.

## SAFFRON WALDEN.

Medical Officer of Health—W. ARMISTEAD, M.B.

|                                   |     |     |     |          |
|-----------------------------------|-----|-----|-----|----------|
| Population, 1891                  | ... | ..  | ... | 6,104    |
| „ 1898                            | ... | ..  | ... | 6,134    |
| Deaths registered in the district | ... |     |     | 105      |
| Corrections                       | ... | ... | .   | — 25 + 0 |



|                      |        | 1898. |     | Mean of 8 years,<br>1890-97. |
|----------------------|--------|-------|-----|------------------------------|
| Corrected Death-rate | ...    | 13.0  | ... | 16.1                         |
| Zymotic Death-rate   | ..     | .97   | ... | 1.4                          |
| Infantile Mortality  | ... .. | 146.  | ... | 110.                         |
| Birth-rate           | ... .. | 22.3  | ... | 22.9                         |
| Zymotic Case-rate    | ... .. | 2.4   | ... | 4.8                          |

*Isolation Hospital.* A Provisional Order combining the Urban and Rural Districts of Saffron Walden into a United District for Hospital purposes under Section 279 of the Public Health Act, 1875, has been obtained, and a Joint Hospital Committee has been constituted.

*Water Supplies.* Twelve wells yielding polluted water have been closed during the year. A special report on the present water supply shews that it is obtained from a deep well bored more than 60 years ago and lined with 4 or 5 inch iron tubes the soundness of which as a protection from pollution no one could possibly guarantee. The chalk is met with at a depth of 10 feet, and the Medical Officer of Health suggests that a new boring, properly lined, should be made, to a depth of about 270 feet. The report has been referred to the consideration of a Special Committee with a view to their undertaking the work.

*Sewerage.* An extension of the existing sewers is much needed, but the Local Government Board will not sanction a loan on the ground that the arrangements for the purification of the sewage are wholly inadequate.

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## SHOEBURY.

Medical Officer of Health—E. W. WALTER, M.R.C.S., L.R.C.P.

|                                   |     |     |     |         |
|-----------------------------------|-----|-----|-----|---------|
| Population, 1891                  | ... | ... | ... | 2,990   |
| „ 1898                            | ... | ... | ... | 4,128   |
| Deaths registered in the district | ... | ... | ... | 45      |
| Corrections                       | ... | ... | ... | — 0 + 0 |

|                            | 1898. | 1897. |
|----------------------------|-------|-------|
| Corrected Death-rate ..    | 10·9  | 11·7  |
| Zymotic Death-rate ... ..  | 1·2   | 1·9   |
| Infantile Mortality ... .. | 167·8 | 145·  |
| Birth-rate ... ..          | 33·2  | 35·2  |
| Zymotic Case-rate ... ..   | 10·9  | 10·7  |

*The Water Supply* is from a deep well belonging to the Council, and a recent analysis shewed that the water was pure.

*Sewerage.* The eastern outfall sewer has been extended seawards for 300 yards with very beneficial results. Nearly all the W.C.'s (497) are connected with the sewers, and have a good supply of water for flushing purposes.

*Scavenging.* The few remaining earth closets are emptied three times a week and the ash pits once a week.

*Overcrowding, etc.* The general condition of the houses of the working classes is good and overcrowding will decrease, as building is steadily progressing.

*Inspections.* These have been made periodically.

*Isolation Hospital.* Arrangements have been made with the Rochford Rural District for the erection of a conjoint Hospital at Sutton Ford Bridge.

## SOUTHEND.

Medical Officer of Health—A. C. WATERS, M.B.

|                                   |     |               |                                       |
|-----------------------------------|-----|---------------|---------------------------------------|
| Population, 1891                  | ... | ...           | 12,333                                |
| „ 1898                            | ... | ...           | 22,583                                |
| Deaths registered in the district | ..  |               | 350                                   |
| Corrections                       | ... | ...           | + 18 — 39                             |
|                                   |     |               | Mean of 7 years,<br>1890-2-3-4-5-6-7. |
| Corrected Death-rate              | ... | 1898.<br>14·5 | ... 14·8                              |
| Zymotic Death-rate ... ..         | ... | 2·6           | ... 2·3                               |
| Infantile Mortality ... ..        | ... | 171·          | ... 140·                              |
| Birth-rate ..                     | ... | 26·7          | .. 25·9                               |
| Zymotic Case-rate ... ..          | ... | 11 7          | ... 14·5                              |



The population calculated by the method employed by the Registrar-General would be only 18,289, but the Medical Officer of Health shews, from an enumeration of the houses built and occupied, that the estimate would be much too low. There is little doubt that the figures given above are approximately correct. Of course, the recently added parish of Southchurch is included in the above estimate.

*Enteric or Typhoid Fever.* This disease shewed a slight increase, 82 houses becoming infected. Of these, 49 had drainage defects. In the St. John's district there was a marked decrease, which may fairly be ascribed to the new sewerage system, which prevents the periodical flooding of houses with sewage owing to the tide-locked sewer. In St. Mary's district (a working class district) an increase of cases was noted, confined mainly to a few roads where overcrowding exists, in consequence of the want of artisan's dwellings. Twelve of the persons attacked had partaken of shell fish, but only one complained of the fish causing sickness, and he had partaken of oysters.

*Inspections.* The Medical Officer of Health says:—"Although good work has been accomplished during the past two years in the house-to-house inspection, still much remains to be done in order to rid the town of leaky drains and consequent saturation of the soil with sewage. Dairies, Milk-shops, etc., have been regularly inspected. Two additional Inspectors have been engaged upon the house-to-house inspection during the year.

*Water Supply.* The Water Company now supply 4,437 customers. The water has been from time to time examined with satisfactory results. The construction of a new reservoir at Thundersley is a very valuable adjunct, ensuring the constancy of the supply. The Water Company, through its Superintendent, has sent notice to the Medical Officer of Health when the supply has been cut off from a house, and also permitted the Medical Officer of Health to examine the wells. He found everything satisfactory. The supply to Southchurch parish is still very unsatisfactory, a large area

being supplied by wells, the water in many instances being unfit for drinking purposes. The Water Company are contemplating the extensions of the mains when arrangements have been made with the private owners of property.

*Slaughter-houses.* A special report was presented in May, 1897, and submitted to the Health Committee. No action was taken to provide a public abattoir, but the matter is still under consideration.

*Refuse Disposal.* The refuse deposited by the Corporation in the brickfields on Sutton Road is still burnt in the open air and lies smouldering for weeks, giving off most offensive fumes, dangerous to the public health. The question of providing a "Destructor" has been under consideration for a considerable time, but has not yet been decided. The Medical Officer of Health says that "If a destructor is vetoed, then the refuse might be carted out of the town into the country and disposed of away from dwelling houses." The importation of unscreened refuse from outside districts should also be stopped.

*Ventilation of Sewers.* Nuisances arose from the escape of sewer gas through the gullies and open manholes, but improvements are being effected which it is hoped will remedy this condition before the ensuing summer.

*Prittlewell.* The sewerage of this portion of the Borough is very necessary, and until this is carried out the Medical Officer of Health recommends the Council to undertake the emptying of the cesspits.

*The Foreshore Fishery.* At present no shell-fish is removed from the foreshore for edible purposes. The Medical Officer of Health recommends:—

- (a) That the Southend foreshore should not be let as a fishery.
- (b) That the Southchurch foreshore should not be used as a fishery.
- (c) That no unauthorized person be allowed to remove shell-fish from the foreshore.



- (d) That the Local Government Board be requested to promote legislation giving powers to Local Authorities to prevent the consumption of shell-fish polluted by sewage.

*Housing of the Working Classes.* There is a scarcity of dwellings suitable for the working classes, leading to overcrowding, but plans have been passed for the erection of 140 cottages on the Oaks Estate, Southchurch. The Medical Officer of Health thinks it desirable that the Town Council should provide cottages under the Housing of the Working Classes Act, and a Committee of the Council are considering the subject.

*Gipsies.* Steps are being taken to obtain Bye-laws for preventing the nuisances caused by gipsies and other tent and van dwellers.

*The Borough Sanatorium.* A new ambulance has been provided. The rapid growth of the Borough will necessitate the question of the building of an additional block being considered in the near future.

*Improvements effected during 1898. Improvements in progress and under consideration :—*

1. Eastern Valley Sewerage; both the high and low level areas are now in operation.
2. Western Valley Sewerage; high level area now in operation.
3. The provision of a Brougham Ambulance.

*In progress—*

1. Western Valley Sewerage, low level area.
2. House-to-house inspection.
3. Making up of Common and Back Passages.
4. Drainage of Pier Pavilion.
5. Connection of house drains to sewage schemes, thus preventing discharge of sewage upon the foreshore.

Under consideration —

1. Drainage of Prittlewell.
2. Disposal of refuse.
3. Artizans' Dwellings.
4. Public Abattoir.
5. The necessity for adding a new block to the Sanatorium.

The Report includes an interesting spot map shewing the distribution of Enteric Fever in the Borough during the year.

### WALTHAM HOLY CROSS.

Medical Officer of Health—J. DAMER PRIEST,  
M.R.C.S., D.P.H.

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 6,066                        |
| „ 1898                            | ... | ...           | ... | 6,780                        |
| Deaths registered in the district | ... |               |     | 84                           |
| Corrections                       | ... | ...           | ... | + 7 — 2                      |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>13·1 | ... | 14·1                         |
| Zymotic Death-rate ...            | ... | 3·1           | ... | 2·1                          |
| Infantile Mortality ...           | ... | 134·          | ... | 122·                         |
| Birth-rate ..                     | ... | 25·2          | ... | 28·3                         |
| Zymotic Case-rate ...             | ... | 6 7           | ... | 7·2                          |

*Water Supply.* Notwithstanding the drought, the East London Company was enabled to give a full supply of perfectly pure water. Forty-one shallow well waters were examined and many reported as being unfit for domestic purposes. Statutory notices to connect with the mains were served on all the owners, with varying success, and with those in default it is the Council's intention to proceed a step further.

*Housing of the Working Classes.* The demand for such houses still exists, and many defective dwellings exist. By frequent inspection much has been done to ameliorate temporarily the cottagers' lot.



*Infectious Diseases.* An interesting table is given (quoted elsewhere in this Report) shewing the effect of the Serum treatment on the mortality from Diphtheria. Diarrhœa in an epidemic form was rife in the Autumn. Measles became epidemic in January, and the Medical Officer of Health advocates this disease being scheduled amongst those to be notified.

*Sewerage.* The sewage is treated at the farm by "intermittent downward filtration" and has been quite satisfactory. The absurd method of placing a 3in. hose in a 9in. drain is an altogether inadequate system of flushing.

*Isolation Hospital.* The probability of forming a combined district seems remote, since Walthamstow, Epping and Chingford refuse to join. A permanent Hospital is required. The temporary structure has not been used during the year. The unavoidable delays in getting such a place in working order renders such buildings obsolete for practical purposes.

*Insanitary Area.* This scheme, referred to in previous reports, is now being carried out. The ten houses on the East Brook Estate to accommodate some of the persons displaced are practically completed. Certain properties have been purchased, others are being negotiated for.

*Scavenging.* The street cleansing appears to be neglected. Fewer complaints have been received as to the removal of house refuse by the contractor, but the majority of the houses are without movable receptacles.

*Bye-laws.* The new Model Bye-laws are still in the hands of the Local Government Board.

*Inspections.* Both periodically and as occasion required inspections have been made. No less a sum than £14 12s. 6d. was paid as compensation for the destruction of infected bedding.

## WALTHAMSTOW.

Medical Officer of Health—J. J. CLARKE, L.R.C.P.I., D.P.H.

|                                   |     |      |     |                  |
|-----------------------------------|-----|------|-----|------------------|
| Population, 1891                  | ... | ...  | ... | 46,346           |
| „ 1898                            | ... | ...  | ... | 80,000           |
| Deaths registered in the district | ... | ...  | ... | 1,034            |
| Corrections                       | ... | ...  | ... | + 60 — 15        |
|                                   |     |      |     | Mean of 8 years, |
|                                   |     |      |     | 1898. 1890-97.   |
| Corrected Death-rate              | ... | 13·5 | ... | 14·5             |
| Zymotic Death-rate                | ... | 3·5  | ... | 2·8              |
| Infantile Mortality               | ..  | 169· | ... | 137·             |
| Birth-rate                        | ... | 28·7 | ... | 33·6             |
| Zymotic Case-rate                 | ... | 8·6  | ... | 11·8             |

The population estimated by the Medical Officer of Health gives 5·9 persons per inhabited house, and either the average is high in Walthamstow or the population is slightly over-estimated. Until the next census year it is impossible to speak with certainty of the population of such rapidly increasing districts.

*Infantile Mortality.* An epidemic of diarrhoea occurred in August and September, and caused the death of 154 children under 5 years of age. This epidemic caused the Infantile Mortality and Zymotic Death-rate to be unusually high. A special report was presented on this subject.

*Isolation Hospital.* A hospital is in course of erection, but it will only provide 18 beds. It appears to be proposed to increase the accommodation to 46 beds but this will only suffice “for times of normal sickness.”

*Water Supply.* The town is supplied by the East London Company and in the late summer great inconvenience and hardships was caused by the insufficiency of the supply. In August the supply was limited to 6 hours and subsequently curtailed to 4 hours which continued until November. Chemical and Bacteriological examinations of the water were made but the results are not stated.



*Sewage Disposal.* The black ash process of purification is being tried, followed by filtration through land. The septic tank system is advocated. Analyses of the effluents shewed a considerable improvement on previous years.

*Offensive Trades.* A fat boiling business gave a good deal of trouble but the nuisance was ultimately abated. An attempt to establish another such trade in the district was prevented.

*Mortuary.* A new mortuary with proper accommodation for *post mortems*, waiting rooms, etc. is about to be erected.

*Inspection.* 2,783 houses have been inspected and works of sanitary improvements executed in 1,327 of them. 121 premises are registered under the Factories and Workshops Act. These, together with Dairies, Cowsheds, Slaughter Houses have been systematically inspected. It is gratifying to find that the premises of ice cream vendors are visited, and still more to hear that all were taking reasonable precautions to secure cleanliness in its manufacture. On account of complaints of nuisances arising on fishmongers' premises, these were inspected twice a week during the summer.

*Sale of Food and Drugs Act.* 36 samples were taken for analysis. In 6 cases legal proceedings were instituted and fines inflicted. A quantity of herrings and other articles of food were seized and destroyed. The report contains a chart showing Birth-rates, Death-rates, etc., for a series of years, and a meteorological table compiled by Mr. Goodchild.

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## WANSTEAD.

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

|                                   |     |     |     |               |
|-----------------------------------|-----|-----|-----|---------------|
| Population, 1891                  | ... | ... | ... | 7,042         |
| „ 1898                            | ... | ... | ... | 7,950         |
| Deaths registered in the district | ... | ... | ... | 59            |
| Corrections                       | .   | ... | ..  | ... — 10 + 0? |

|                          |     | 1898. | Mean of 7 years,<br>1891-97. |
|--------------------------|-----|-------|------------------------------|
| Corrected Death-rate (?) | ..  | 10·7  | 10·8                         |
| Zymotic Death-rate       | ... | ·8    | ·9                           |
| Infantile Mortality      | ... | 163·  | 106·                         |
| Birth-rate               | ..  | 20·1  | 20·1                         |
| Zymotic Case-rate        | ... | 10·9  | 7·5                          |

No correction appears to be made for deaths occurring outside the District among persons belonging thereto.

*Water Supply.* "There was . . . a drought and a scare, for the water supply had to be curtailed from three hours to two hours daily—water carts in short, were requisitioned to meet emergencies. Summer diarrhoea was prevalent then . . . It is to be hoped that the East London Water Company have now learned a lesson, for the serious failure of water supply has occurred two years in succession."

*Zymotic Diseases.* The schools were closed for two weeks on account of an outbreak of Scarlet Fever. Bedding, etc., had to be sent to Woodford for disinfection.

*The Hospital.* 30 patients were removed from this district and 28 from Woodford. A tent for 8 beds had to be erected to meet pressing needs.

### WALTON-ON-THE-NAZE.

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

|                                   |     |         |
|-----------------------------------|-----|---------|
| Population, 1891                  | ... | 1,581   |
| „ 1898                            | ... | 1,649   |
| Deaths registered in the district | ... | 27      |
| Corrections                       | ... | — 2 + 0 |

|                      |     | 1898. | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|------------------------------|
| Corrected Death-rate | ... | 15·1  | 16·1                         |
| Zymotic Death-rate   | ... | ·6    | 2·5                          |
| Infantile Mortality  | ... | 128·  | 125·                         |
| Birth-rate           | ... | 23·6  | 27·3                         |
| Zymotic Case-rate    | ... | 4·8   | 5·1                          |



*Water Supply.* The supply to the town is from the Tendring Hundred Company's mains and was plentiful and satisfactory. In the rural portions of the district the supply is from shallow wells.

*Sewerage.* A new and much needed sewerage scheme is under consideration.

*Improvements.* An extensive collection of animals kept in a yard in the central part of the town for years has been removed. The Coast Development Company and the Trustees of the late Mr. Warner are carrying out improvements which it is believed will tend to the development of the town.

*Isolation Hospital.* Efforts to obtain a site have not yet been successful.

*Inspection.* About 44 premises have been inspected and 8 nuisances detected and abated. Still the Medical Officer of Health reports that "there has been a good deal of work done during the year."

## WITHAM.

Medical Officer of Health—W. D. GIMSON, M.D.

|                                   |     |     |     |         |
|-----------------------------------|-----|-----|-----|---------|
| Population, 1891                  | ... | ... | ... | 3,228   |
| „ 1898                            | ... | ..  | ... | 3,400   |
| Deaths registered in the district | ... |     |     | 30      |
| Corrections                       | ... | ... | ... | — 1 + 0 |

|                      |     | 1898. |     | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|-----|------------------------------|
| Corrected Death-rate | ... | 8.5   | ... | 13.7                         |
| Zymotic Death-rate   | ..  | .3    | ... | .9                           |
| Infantile Mortality  | ... | 57.   | ... | 103.                         |
| Birth-rate           | ... | 20.6  | ... | 24.6                         |
| Zymotic Case-rate    | ..  | 4.4   |     | 3.                           |

The death-rate for the year is the lowest recorded.

*The Water Supply.* An application to the Local Government Board for permission to borrow money to increase the supply from the present source was refused. The Medical Officer of Health recommends that an engineer be called in to report on the whole subject. A small portion of the present supply is from a deep well, when first sunk yielded sufficient water for the requirements of the town. The yield however failed very rapidly and water from a spring had to be piped to the well to supplement the supply. This spring is not adequately protected and yields a very hard water. The Medical Officer of Health does not think that there is any hope of obtaining a supply from a deep well, as three such wells in the town are more or less failures. Certain portions of the Urban District are either inadequately supplied or have no proper supply.

*Isolation Hospital.* The necessity for such a building has been urged again and again, but nothing definite has yet been decided upon.

*Scavenging, etc.* "Good work has been done during the year in carrying out the scavenging, attending to the sewers, etc."

## WOODFORD.

Medical Officer of Health--W. G. GROVES, M.R.C.S.

|                                   |     |       |          |                  |
|-----------------------------------|-----|-------|----------|------------------|
| Population 1891                   | ... | ...   | ..       | 11,024           |
| „ 1898                            | ... | ...   | ...      | 13,837           |
| Deaths registered in the district | ..  |       |          | 147              |
| Corrections                       | ... | ...   | ... + 15 | — 0              |
|                                   |     |       |          | Mean of 8 years, |
|                                   |     | 1898. |          | 1896-97.         |
| Corrected Death-rate              | ... | 11.7  | ...      | 11.8             |
| Zymotic Death-rate                | ... | 1.7   | ...      | 1.3              |
| Infantile Mortality               | ... | 145.  | ...      | 121.             |
| Birth-rate                        | ... | 24.9  | ...      | 26.3             |
| Zymotic Case-rate                 | ..  | 5.4   | ...      | 8.5              |



*Water Supply.* Water is supplied by the East London Company and was very limited in amount during the hot season. Some inconvenience was caused by the taps on the supply pipes from the mains being only partially turned on, thus greatly diminishing the pressure of the water and the supply to run short when the water was only turned on for a few hours daily.

*Sewerage and Sewage Works.* The sewage from Woodford will in the near future be more completely purified than it has been hitherto and this will tend to diminish the pollution of the river. This "requires cleaning out and deepening along its whole length, it is a sluggish stream." The sewers are being more efficiently ventilated.

*Faulty Water Closets.* The insanitary condition of many houses produced by the want of direct water supply to the Closets was mentioned in the previous annual report. It has received special attention during the year and wherever such a condition was found it has been remedied.

*Extension of the District.* A populous portion of Walthamstow adjoins an equally populous portion of Woodford and infection from the former has on several occasions spread to the latter on account of patients not being removed to Hospital. This portion of Walthamstow the Medical Officer of Health says: "Should certainly be joined to Woodford for sanitary purposes as it is already for ecclesiastical and other purposes."

*Isolation Hospital.* The disadvantage of the present arrangements with Wanstead was dwelt upon. The steam disinfecter has been found very useful.

*Infectious Diseases.* Diarrhœa became epidemic in the Autumn and caused the deaths of 16 children. Fourteen of these were under one year of age and upon personal enquiry it was found that nearly all these were children being brought up by hand. The Medical Officer of Health thinks that "these cases ought not to be classed with Zymotic diseases, they are dependent upon unsuitable feeding, want of cleanliness. It is probable that they were increased in number this year by the

short supply of water." An outbreak of measles in July necessitated the closure of the Woodford Green Infants' Board Schools. The advantage derived from the Bacterial diagnosis of Diphtheria and of the bacteriological examination of the secretion from the throat before a certificate of freedom from infection is given, is dwelt upon and referred to elsewhere in this report.

*Drain-testing.* The necessity for the occasional testing of all drains is urged and the example of Bancroft's School cited. The drainage here is said to be thoroughly up to date, but when examined, on account of an outbreak of scarlet fever, several joints in the ventilating pipes were found defective and *all* were stopped up with sparrows nests.

*Anthrax.* A case of Anthrax occurred on a farm here. The sanitary conditions were found to be unsatisfactory. The premises and surroundings have since been placed in a good condition.

## WIVENHOE.

Medical Officer of Health—G. PENDER-SMITH, L.S.A.

|                                   |     |     |     |               |
|-----------------------------------|-----|-----|-----|---------------|
| Population, 1891                  | ... | ... | ... | 2,300         |
| „ 1898                            | ... | ... | ... | 2,700         |
| Deaths registered in the district | ... |     |     | 44            |
| Corrections                       | ... | ... | ... | + 1 — 1       |
| Corrected Death-rate              | ... | ... | ... | 1898.<br>16·3 |
| Zymotic Death-rate                | ... | ... | ... | 3·7           |
| Infantile Mortality               | ... | ... | ... | 144·          |
| Birth-rate                        | ... | ... | ... | 28·1          |
| Zymotic Case-rate                 | ... | ... | ... | 5·2           |

This District only became Urban during the year under consideration and the Medical Officer of Health was not appointed until July. His report however has reference to the whole year.



The District consists of the parish of Wivenhoe. It stands on a gravel patch overlying the London clay and is bounded on the west by the tidal river Colne. It has an area of 1,549 acres, and contains about 400 houses. There is evidently, therefore, some overcrowding.

*Water Supply.* This is at present derived from wells or springs liable to pollution, but the Council have decided upon a public supply to be obtained from a deep well in the chalk, and the Medical Officer of Health strongly urges upon all concerned the great necessity of having these proposals carried out with as little delay as possible.

*Sewerage.* This is at present very unsatisfactory, but the Council have adopted plans for a complete system of sewerage works, and the sewage will be disposed of under septic system.

*Industries.* Ship and boat building, fishing, yachting, rope making, and agriculture. None of these are likely to have ill effect upon the health of the work people.

*Bye-laws.* These are at present under consideration with a view to adoption.

*Inspections.* The Medical Officer of Health and Inspector have made many inspections and presented bi-monthly reports to the Council. Many sanitary defects have been discovered and in the majority of instances, suitable improvements have been made, pending the adoption of systems of sewerage and water supply. The Council is also negotiating for the purchase of additional land for burial purposes as all the grave spaces in the unconsecrated portion of the present cemetery are taken up.

*Isolation Hospital.* There is no provision made for isolating persons suffering from infectious disease. Disinfection is carried out by means of the "Alformant lamp" and by the use of Formalin.

*Infectious Diseases.* Some cases of Diphtheria and Typhoid Fever which occurred were apparently attributable to insanitary conditions. Whooping Cough became epidemic in November and necessitated the closing of the Infants' School for a month.

The Report concludes. There is every prospect of the population of the district increasing, as very suitable plots of land are now being disposed of for building purposes. With the new scheme for water and sewerage carried out, I have every reason to believe that Wivenhoe will enter upon a new era of prosperity, and that the great improvements which will be effected by these much-needed sanitary works will eventually more than compensate the ratepayers for the considerable outlay of money which is made for these purposes.

## RURAL DISTRICTS.

### BELCHAMP.

Medical Officer of Health—J. S. HOLDEN, M.D.

|                                   |     |       |     |                             |
|-----------------------------------|-----|-------|-----|-----------------------------|
| Population, 1891                  | ... | ..    | ... | 5,722                       |
| „ 1898                            | ... | ...   | ... | 5,722                       |
| Deaths registered in the district | ... |       |     | 71                          |
| Corrections                       | ... | ...   | ..  | + 8 — 0                     |
|                                   |     |       |     | Mean of 8 years<br>1890-97. |
| Corrected Death-rate              | ... | 1898. | ... | 15·7                        |
| Zymotic Death-rate                | ... | ·8    | ... | 8·0                         |
| Infantile Mortality               | ... | 87·   | ..  | 113·                        |
| Birth-rate                        | ... | 18·0  | ..  | 22·1                        |
| Zymotic Case-rate                 | ... | 5·7   | ... | 9·4                         |

*Infectious Disease.* Measles became epidemic in several parishes, necessitating the closing of the Elementary Schools. Mumps was epidemic in Bulmer during March, and this School was closed for a month.

*Water Supplies.* The supply was in most villages very limited during the summer, both the private and public wells being affected by the drought. Two new wells were sunk and many old ones deepened.



*Sewers and Sewage.* The privy and midden system is in general use. The Lyston ditch becomes foul with the sewage and brewery waste from the village. The ditch has been cleaned out and the brewery waste is being filtered. The result is not yet satisfactory. Some new drains have been laid in Belchamp St. Paul's to relieve some stagnant and offensive ditches.

*Inspections.* Every parish has been systematically inspected. Five houses were reported as being unfit for human habitation. Two were rebuilt and three closed. "Many improvements have been made in the condition of cottage premises, such as the prevention and removal of offensive accumulations, the emptying and cleansing of cesspools, ash-pits, and pig-styes."

### BILLERICAY.

Medical Officer of Health—F. CARTER, M.D.

|                                   |     |     |     |        |
|-----------------------------------|-----|-----|-----|--------|
| Population, 1891                  | ... | ... | ... | 20,564 |
| Deaths registered in the district | ... | ... | ... | 479    |
| Corrections                       | ... | ... | ... | — 215  |

|                      |     | 1897. |     | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|-----|------------------------------|
| Corrected Death-rate | ... | 12·8  | ... | 15·5                         |
| Zymotic Death-rate   | ... | 1·8   | ... | 1·2                          |
| Infantile Mortality  | ... | 123·  | ... | 98·                          |
| Birth-rate           | ... | 22·3  | ... | 27·7                         |
| Zymotic Case-rate    | ... | 1·5   | ... | 7·1                          |

*Infectious Diseases.* A severe epidemic of Measles commenced in February and affected every parish. It spread from the west towards the east and south and school after school in the line of march had to be closed. At the Davenport Hill School, under the control of the London School Board an extensive outbreak of illness occurred in August and September affecting 56 children out of a total of 96. The symptoms were in some respects like those of Influenza, but the Medical Officer of Health thinks they were simply cases of "heat stroke"

caused by the excessive and long continued heat and the insanitary conditions under which the children lived, the overcrowded, badly ventilated dormitories being the more active factor. Dr. Carter thinks "that no amount of alteration can make this a proper place for a school." Many sporadic outbreaks of typhoid fever occurred.

*Isolation Hospital.* This was occupied all the year save for a fortnight when it was closed to permit of the nurse having a holiday. The Council is asked to erect a cottage in the hospital grounds for a caretaker and wife. This "would be a great gain to the hospital and would make it complete in itself."

*Water Supply.* In certain parts of the district the scarcity of water during the summer caused great distress. There is ample water on Bell Hill to supply Slyce's Gate and the Medical Officer of Health urges on a scheme for supplying this Hamlet from a reservoir on the Hill. Cray's Hill, Little Warley, Vange, Pitsea and Bowers also suffer from want of water. Terms were arranged with the Southend Water Co. to supply certain of these parishes at the rate of 1/6 per 1,000 gallons, but the water cannot be demanded until certain works are executed in the district.

*Sewerage.* Serious nuisances arise from the want of an adequate system of sewerage for the town of Billericay. An engineer has been called in but as yet no plans have been decided upon.

*Inspection.* The usual routine has been gone through. "There is as a rule little fault to be found now—those concerned being well up to the requirements of the Sanitary Acts."

### BRAINTREE.

Medical Officer of Health—T. CARR, M.D., D.P.H.

|                                   |     |     |     |         |
|-----------------------------------|-----|-----|-----|---------|
| Population, 1891                  | ... | ... | ... | 19,734  |
| „ 1898                            | ..  | ... | ... | 19,734  |
| Deaths registered in the district | ... | ... | ... | 284     |
| Corrections                       | ... | ... | ... | — 9 + 0 |



|                      |     | 1898. |     | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|-----|------------------------------|
| Corrected Death-rate | ... | 13·9  | ... | 15·1                         |
| Zymotic Death-rate   | ... | ·8    | ... | 1·0                          |
| Infantile Mortality  | ... | 104·  | ... | 103·                         |
| Birth-rate           | ... | 19·9  | ... | 23·2                         |
| Zymotic Case-rate    | ... | 8·0   | ... | 6·0                          |

*Isolation Hospital.* The Urban and Rural Districts have formed a Joint Hospital District, and a Hospital is now in course of erection.

*Water Analysis.* Seven samples of water were examined and three condemned.

*Drainage, etc.* Considerable improvement has been made at Kelvedon. Where the sewer discharges into the river a small intercepting tank and filter has been placed, "which renders the effluent colourless and inoffensive in character."

*Inspection.* Two cases of overcrowding were remedied. Six houses have been closed, and eight have been put in habitable repair.

*Infectious Diseases.* Cressing School was closed on account of Measles, and an outbreak of German Measles necessitated the closing of the National School at Gréat Saling.

### BUMPSTEAD.

Medical Officer of Health—W. ARMISTEAD, M.B.

| Population, 1891                  | ... | ..    | ... | 2,886                        |
|-----------------------------------|-----|-------|-----|------------------------------|
| „ 1898                            | ... | ...   | ... | 2,886                        |
| Deaths registered in the district | ... |       |     | 32                           |
| Corrections                       | ... | ...   | ..  | + 4 — 1                      |
|                                   |     | 1898. |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 12·1  | ... | 15·2                         |
| Zymotic Death-rate                | ... | ·3    | ... | 1·3                          |
| Infantile Mortality               | ... | 145·  | ..  | 112·                         |
| Birth-rate                        | ... | 19·0  | ... | 26·6                         |
| Zymotic Case-rate                 | ... | 6·2   | ... | 10·2                         |

*Infectious Diseases.* An epidemic of Whooping Cough occurred at Ashen in June, and the Schools were closed for three weeks.

*Isolation Hospital.* The Clare and Bumpstead Joint Hospital Board is still seeking a suitable site.

*Water Supply.* In certain portions of the district there was a great scarcity of water during the summer. At Crook End, Helions Bumpstead, water had to be carted round from a well at Pale Green. An application was made to the Local Government Board for permission to provide a supply from a deep well. This was refused on account of the unsatisfactory nature of the water yielded by deep wells in that locality.

*Inspection.* No house has been closed as unfit for human habitation, but six have been put in habitable repair.

## CHELMSFORD.

Medical Officer of Health—JOHN C. THRESH,

M.D., D.Sc., D.P.H.

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 23,174                       |
| „ 1898                            | ... | ...           | ... | 23,603                       |
| Deaths registered in the district | ... | ...           | ... | 336                          |
| Corrections                       | ... | ...           | ... | + 37 — 4                     |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>15·6 | ... | 14·8                         |
| Zymotic Death-rate                | ... | ·97           | ... | 1·3                          |
| Infantile Mortality               | ... | 132·          | ... | 90·                          |
| Birth-rate                        | ... | 22·1          | ... | 25·0                         |
| Zymotic Case-rate                 | ... | 4·2           | ... | 6·1                          |

*Water Supplies.* The extension of the water mains from Danbury to the remote parishes of Rettendon (including Battles Bridge), Woodham Ferris, and Runwell has been completed. The work was not carried out satisfactorily, and the prolonged drought seriously diminished the supply from the springs. A consulting engineer has been called in, and his recommendations



are under consideration. The water supply to Ingatestone village partially failed on account of the drought, and the Surveyor prepared a scheme for submission to the Local Government Board. The Board, however, without holding an enquiry, refused to entertain the scheme, which was to obtain water from the subsoil at a place where efficient protection was practically impossible. A better supply is urgently required. The scheme for supplying the village of Writtle with water has been approved by the Local Government Board, and Messrs. Taylor and Santo Crimp have been called in to carry this and the sewerage scheme to completion, the continued illness of the Surveyor rendering it impossible for him to give it personal attention. The public supply to the parishes of Great Baddow and Springfield also requires attention. The spring is not adequately protected and the increasing population requires more water during summer than is now available. A number of minor improvements in connection with local supplies are chronicled.

*Sewerage.* The sewage of Writtle caused serious pollution of the River Wid during the autumn; but the scheme for sewer-ing the village having been approved by the Local Government Board, doubtless the pollution will speedily cease.

*Housing of the Working Classes Act.* Several houses have been represented to be unfit for human habitation. Some of these are still occupied, and the Council has taken no steps to have them closed or placed in repair.

*Inspection.* The continued illness of the Inspector has caused this work to be neglected, to the detriment generally of the district. Many infringements of the building bye-laws are due to the same cause.

*Isolation Hospital.* This has proved of the greatest service, and since its erection the number of cases of infectious disease notified has diminished 50 per cent.

*Infectious Diseases.* Measles, Mumps and Whooping Cough were the diseases most prevalent. The Schools at Stock and Ford End were closed for a time on account of Measles.

## DUNMOW.

Medical Officer of Health—R. RICHMOND, M.D. (Jan. to Sept.)

„ „ E. E. GOODBODY, M.D. (Sept. to Dec.)

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 16,674                       |
| „ 1898                            | ... | ...           | ... | 16,674                       |
| Deaths registered in the district | ... |               |     | 225                          |
| Corrections                       | ... | ...           | ... | + 0 — 0                      |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>13·5 | ... | 15·9                         |
| Zymotic Death-rate                | ... | ·9            | ... | ·9                           |
| Infantile Mortality               | ... | 83·           | ... | 86·                          |
| Birth-rate                        | ... | 22·4          | ... | 24·5                         |
| Zymotic Case-rate                 | ... | 3·6           | ... | 5·6                          |

During the year the Medical Officer of Health resigned and Dr. Goodbody was only appointed in September. The report contains no reference to the sanitary condition of the district. The Sanitary Inspector's report, however, shews that he keeps the whole district continuously under inspection. Five houses have been closed as unfit for human habitation.

*Infectious Diseases.* Several outbreaks occurred of Diphtheria and Typhoid Fever in houses in an unsanitary condition. No less than seven Schools were closed on account of the prevalence of Measles, Whooping Cough and Influenza.

## EPPING.

Medical Officer of Health—TREVOR FOWLER, L.R.C.P.

and S.I., D.P.H.

|                                   |     |     |     |           |
|-----------------------------------|-----|-----|-----|-----------|
| Population, 1891                  | ... | ... | ... | 15,952    |
| „ 1898                            | ... | ... | ... | 16,873    |
| Deaths registered in the district | ... |     |     | 265       |
| Corrections                       | ... | ... | ... | + 20 — 26 |



|                      |     | 1898. |     | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|-----|------------------------------|
| Corrected Death-rate | ... | 15.2  | ... | 14.5                         |
| Zymotic Death-rate   | ... | 2.3   | ... | 1.5                          |
| Infantile Mortality  | ... | 108.  | ... | 108.                         |
| Birth-rate           | ... | 25.7  | ..  | 26.5                         |
| Zymotic Case-rate    | ... | 4.8   | ... | 5.9                          |

The population of Loughton and Chigwell is said to be increasing rapidly, and the Medical Officer of Health thinks that the class of people migrating from London have a depreciatory effect upon the health statistics.

*Inspections.* Many portions of the district have been inspected, chiefly in connection with outbreaks of infectious disease.

*Sanitary Improvements Effected.* A new public well has been sunk at Rye Hill and a plentiful supply of good water obtained. A pump has been fixed. Other wells were sunk at Matching and Hastingwood Common. The Medical Officer of Health advocates the sinking of wells in other portions of the district. At Roydon the water level fell so low that the public well had to be deepened. Several ditches, watercourses, ponds, etc., have been cleansed.

*Infectious Diseases.* Several epidemics of Measles occurred during the year, and a number of Schools had to be closed.

*Isolation Hospital.* The hospital is being enlarged by the addition of a new ward for eight beds, and the existing building is being improved. Better accommodation is to be provided for nurses, the caretaker's cottage is to be altered and improved, and the drainage re-arranged.

*Sanitary Requirements of the District.* "The system of drainage which it has year after year been hoped would be provided for Woburn Avenue, and other parts of Theydon Bois, has not yet been commenced, and it is obvious that with the addition to the number of houses which is constantly taking place, the need for proper drainage there becomes more urgent. In certain parts of Chigwell the drainage is

still of the most primitive character, and some attempt should be made to prevent the continued pollution of the Roding. At Harlow Common, Potter Street, Sheering and other villages the drainage is defective. There is still a serious want of water in some parts of the district ; this is particularly so at Nazeing."

### HALSTEAD No. 1.

Medical Officer of Health—J. H. ASHWORTH, M.D.

|                                  |     |               |     |                              |
|----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                 | ... | ...           | ... | 4,762                        |
| „ 1898                           | ... | ...           | ... | 4,955                        |
| Death registered in the district | ... | ...           | ... | 53                           |
| Corrections                      | ... | ...           | ... | + 9 — 0                      |
|                                  |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate             | ..  | 1898.<br>12·5 | ... | 14·0                         |
| Zymotic Death-rate ...           | ... | ·0            | ... | ·7                           |
| Infantile Mortality ...          | ... | 101·          | ... | 99·                          |
| Birth-rate ...                   | ... | 19·9          | ... | 22·7                         |
| Zymotic Case-rate ..             | ... | 5·8           | ... | 3·7                          |

*Infectious Diseases.* The number of cases notified were greatly in excess of previous years "and attributable in a large degree to the importation of scarlet fever by Jewish children sent down to Earls Colne for a holiday."

*Inspection.* A systematic inspection has been made of Colne Engaine and Gosfield. A number of sanitary defects and dilapidated houses were discovered. Bake-houses and slaughter-houses have all been inspected.

*Sanitary condition of Earls Colne.* The water supply should receive early attention. The Council has under consideration a scheme for sewerage the town and purifying the sewage before discharging it into the river.



## HALSTEAD No. 2.

Medical Officer of Health—J. B. BROMLEY, M.R.C.S.

|                                   |       |      |     |                              |
|-----------------------------------|-------|------|-----|------------------------------|
| Population, 1891,                 | ...   | ...  | ... | 6,043                        |
| Deaths registered in the district | ...   |      |     | 77                           |
| Corrections                       | ...   | ...  | ... | + 8 — 0                      |
|                                   |       |      |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | 1898. | 14.0 | ... | 14.8                         |
| Zymotic Death-rate                | ...   | .33  | ..  | .6                           |
| Infantile Mortality               | ...   | 133. | ... | 95.                          |
| Birth-rate                        | ...   | 23.6 | ... | 24.3                         |
| Zymotic Case-rate                 | ...   | 2.9  | ... | 4.7                          |

*Inspections.* Several parishes have been systematically inspected, and all the bake-houses, slaughter-houses, dairies and cowsheds have been examined. The defects found have not in all cases been remedied. Seven houses were reported as being unfit for human habitation and have been closed.

*Infectious Disease.* The National Schools at Great Yeldham and Ridgewill were closed on account of the prevalence of measles and whooping cough.

*Isolation Hospital.* The house used for a hospital at Hedingham has now been purchased by the Council and various improvements are about to be effected.

*Water Supply.* The prolonged drought directed considerable attention to the sources of public supply and several new public wells have been sunk. Springs at Ridgewell and Little Yeldham have been ordered to have properly constructed reservoirs, to be domed over and have pumps fixed. Several portions of the district are still badly supplied with water.

*Drainage.* Several improvements are chronicled in Castle Hedingham and Sible Hedingham.

*Sanitary Requirements.* The more important are stated to be :—

An Isolation Hospital for the Northern Parishes.

Bye-laws with references to the removal of refuse and for the prevention of nuisances from the improper keeping of animals.

## LEXDEN &amp; WINSTREE.

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

|                                   |     |     |     |         |
|-----------------------------------|-----|-----|-----|---------|
| Population, 1891                  | ... | ... | ... | 19,266  |
| „ 1898                            | ... | ... | ... | 21,087  |
| Deaths registered in the district | ... | ... | ... | 288     |
| Corrections                       | ... | ... | ... | — 2 + 0 |

|                       |     | 1898. | Mean of 8 years,<br>1890-97. |
|-----------------------|-----|-------|------------------------------|
| Corrected Death-rate  | ... | 13·5  | 14·4                         |
| Zymotic Death-rate .. | ... | 1·0   | 1·4                          |
| Infantile Mortality   | ... | 80·   | 97·                          |
| Birth-rate            | ... | 24·1  | 25·4                         |
| Zymotic Case-rate     | ... | 3·3   | 7·5                          |

*Infectious Diseases.* Measles, mumps and whooping cough appear to have been most prevalent and the schools in Great Horkesley, Mount Bures, and Eight Ash Green, Cofford had to be closed.

*Housing of the Working Classes Act.* Under this Act 12 houses have been represented as being unfit for habitation. Notices to repairs were served and these are being complied with.

*Water Supply.* The public supply to Messing failed from deposit in the pipes. A portion of the pipe has been relaid, but they have again become blocked. There is a considerable tract of district to the South comprising the parishes of Salcot, Virley, Great Wigborough and Little Wigborough in which there is practically no supply save from ponds. The Medical Officer of Health recommends the utilization of a spring in Pods Wood for the supply of these parishes. A portion of Stanway is supplied from the Colchester mains but other houses have been erected, but which are not supplied on account of the prohibitive charge proposed by the Colchester Corporation. For this increasing locality the Medical Officer of Health suggests that the Council should provide a local supply by sinking a well. The water supplies



to Great Tey have been improved by the lining of certain wells with large stoneware pipes, in such a manner as to keep out all surface soakage.

*The River Colne.* The cleaning of the bed of this river is very desirable. In several places it is nearly silted up. Steps should be taken to purify all sewage before permitting it to enter the river.

*Sewerage.* The sewerage of Rowhedge, East Donyland is most unsatisfactory. The sewage goes directly into the Colne. The drainage of West Mersea also requires attention and that without delay. The drainage of Great Tey has been improved.

*Inspection.* "A good amount of work" has been done during the year. Outbreaks of disease caused many sanitary improvements to be effected.

### MALDON.

Medical Officer of Health—J. C. THRESH, M.D., D.SC., D.P.H.

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 15,623                       |
| „ 1898                            | ..  | ...           | ... | 15,710                       |
| Deaths registered in the district | ... |               |     | 231                          |
| Corrections                       | ... | ...           | ... | + 23 — 1                     |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>16·0 | ... | 15·3                         |
| Zymotic Death-rate                | ... | 1·15          | ... | 1·3                          |
| Infantile Mortality               | ... | 92·           | ... | 102·                         |
| Birth-rate                        | ... | 25·0          | ... | 27·0                         |
| Zymotic Case-rate                 | ..  | 3·8           | ... | 5·9                          |

*Water Supply.* An important scheme for supplying the parishes of Woodham Mortimer, Hazeleigh, Purleigh, Latchingdon, Althorne, Cold Norton, Stow Maries and Fambbridge with water from a spring at Woodham Walter received the sanction of the Local Government Board. The estimated

cost is £10,775. The water will be collected in a reservoir and pumped by means of oil engines into a second reservoir on high ground in Woodham Mortimer. From here the water will flow by gravitation through the whole district to be served. Such a scheme has been under consideration for some years, but it was not until the painful experience of the dry summer had taught its lesson that the parishes withdrew their opposition.

Several improvements have been effected in local supplies, but in several other parishes the water supply is either deficient in quantity or defective in quality. These doubtless will receive attention when the above comprehensive scheme is completed.

*Sewerage and Drainage.* Plans are being prepared for the sewerage of Southminster. The present sewer outfalls cause serious nuisances. At Tollesbury the sewerage system is to be improved by an extension in the direction of the Coast Guard and by the provision of tanks for bacterial filtration. Plans have been sent to the Local Government Board for approval. At Stow Maries the drainage arrangements have been improved. The sewage farm at Tolleshunt D'Arcy has given rise to trouble on account of sewage getting into the under drains in an impure condition.

*Public Scavenging.* Tollesbury and Southminster are scavenged by contractors, and no complaints have been heard. To protect the springs supplying Southminster with water, arrangements have been made for the scavenging of the pail closets, etc., at a group of cottages on the edge of the collecting area.

*River Pollution.* A factory at Tiptree occasionally pollutes a brook which supplies drinking water for a portion of Tolleshunt Knights. A complaint was received of the pollution of the Blackwater by the sewage of a village in an adjoining district.

*Isolation Hospitals.* The peculiar configuration of the district, divided into two equal parts by the broad estuary of



of the Blackwater, renders it impossible to utilize one Hospital for the whole district. Plans have been passed by the Local Government Board for a Hospital for the Southern portion of the district and an endeavour is being made to join with Maldon borough in the provision of a Hospital to serve for the Northern parishes and the borough.

*Inspections.* Certain parishes are systematically inspected each month, so that every parish is thoroughly examined once a year. The result of such a course of procedure is most marked. The nuisances detected are duly reported to the Council and if not promptly abated further action is taken. The occupation of dilapidated cottages, of sheds, etc., has given much trouble. The register of dairies and cowsheds is being completed and these together with slaughter-houses and bake-houses receive particular attention.

*Bye-laws* regulating the unloading and carting of manure. These have now received the approval of the Local Government Board.

*Infectious Diseases.* Trouble arises from time to time on account of the 'peculiar people' refusing to call in a medical man. Infectious sickness sometimes occurs and escapes notification until the infection has spread beyond their community.

*Pea Pickers.* A considerable number of people come into the district during the pea-picking season. In a few instances they are housed in barns and farm out-buildings. The desirability of adopting bye-laws will be considered after the experience of the ensuing summer.

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## ONGAR.

Medical Officer of Health—J. C. QUENNELL, M.R.C.S.

|                                   |     |     |     |         |
|-----------------------------------|-----|-----|-----|---------|
| Population, 1891                  | ... | ... | ... | 10,557  |
| Deaths registered in the district | ... | ... | ... | 142     |
| Corrections                       | ... | ... | ... | + 0 — 0 |

|                          | 1898. | Mean of 8 years,<br>1890-97. |
|--------------------------|-------|------------------------------|
| Corrected Death-rate ... | 13·5  | 15·5                         |
| Zymotic Death-rate ...   | ·6    | 1·2                          |
| Infantile Mortality ...  | 101·  | 109·                         |
| Birth-rate ...           | 22·4  | 25·9                         |
| Zymotic Case-rate ...    | 6·4   | 6·9                          |

*Infectious Disease.* An outbreak of Diphtheria occurred at Chipping Ongar, chiefly in the High Street. The Schools were closed for over a month. The Brook at the time, in consequence of the dry summer, was more than usually offensive.

*Holiday Children.* Large numbers of children are sent down from London for short holidays and have brought with them the infection of Scarlet Fever, Diphtheria, Ringworm and Ophthalmia.

*Water Supply.* In most of the small parishes the wells are few in number and the supply inadequate. The new public water supply for Ongar (provided by a local Company) cannot be considered satisfactory, as the source is dangerously liable to pollution.

*Drainage.* Schemes for sewerage the town of Ongar and the villages of Abridge and Blackmore have been prepared.

*Cowsheds and Dairies.* The Council have Bye-laws, but these are not fully enforced, as the Register is incomplete.

## ORSETT.

Medical Officer of Health—REA CORBET, M.R.C.S.

|                                      |          |
|--------------------------------------|----------|
| Population, 1891 ...                 | 14,378   |
| „ 1898 ...                           | 16,774   |
| Deaths registered in the district .. | 266      |
| Corrections ...                      | + 5 — 14 |



|                      |     | 1898. |     | Mean of 8 years,<br>1890-97. |
|----------------------|-----|-------|-----|------------------------------|
| Corrected Death-rate | ... | 15.3  | ... | 14.9                         |
| Zymotic Death-rate   | ... | 2.2   | ... | 2.0                          |
| Infantile Mortality  | ... | 132.  | ... | 123.                         |
| Birth-rate           | ... | 32.4  | ... | 32.4                         |
| Zymotic Case-rate    | ... | 7.2   | ... | 8.8                          |

*Water Supplies.* Little Thurrock, West Thurrock, Stifford, South and North Ockendon, and Tilbury Docks are supplied with water from the South Essex Company's mains. A few parishes are supplied from deep wells, but several parishes have either an insufficient supply or are supplied by wells liable to pollution.

*Sewerage.* There is a sewer from Tilbury Station connected with the Grays system. No other parish is properly sewered. A great improvement has been effected at Stanford-le-Hope, but in this growing district a complete system of sewerage is required. In many parishes cottages drain into ditches. A sewage tank van has been provided for emptying the cesspools at Stanford.

*Public Scavenging.* Moveable galvanized dust-bins are provided at West Thurrock, Tilbury Docks and Stanford-le-Hope, and in these parishes there is a system of public scavenging.

*Inspections.* Many cottages have been condemned and closed; others have been placed in repair. Overcrowding is not found to prevail to any great extent. Bakehouses and Slaughter-houses have been found in good order. The larger Dairies, sending milk to London, are always found in good condition. It is in the smaller ones that defects are found. Many of the Burial Grounds are reported to be overcrowded, and at South Ockendon and Stanford steps are being taken to obtain ground for a Cemetery. A part of the district has been systematically inspected. It is stated that where the Sewage Van and Refuse Cart are in use a great improvement has been effected in the general sanitary arrangements. The most unhealthy part of the district is round Tilbury Docks, but the

connection of the houses with the sewer and abolition of cess-pools will, it is hoped, soon cause a visible decrease in the death-rate.

*Infectious Diseases.* Diarrhœa caused many deaths amongst infants. One case of Small-pox was imported—a Lascar—and was treated in the Tilbury Cottage Hospital.

*Isolation Hospital.* A complete re-organisation of the Staff at the Hospital is being arranged. It is now, apparently, being more largely used.

*Bye-laws.* Power is being sought from the Local Government Board to make Bye-laws under the Public Health (Amendment) Act, 1891.

## ROCHFORD.

Medical Officer of Health—R. YOUNG, M.B.

|                                   |     |               |     |                              |
|-----------------------------------|-----|---------------|-----|------------------------------|
| Population, 1891                  | ... | ...           | ... | 11,871                       |
| „ 1898                            | ... | ...           | ... | 14,524                       |
| Deaths registered in the district | ... | ...           | ... | 269                          |
| Corrections                       | ... | ...           | ... | — 29 + 0                     |
|                                   |     |               |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>16·5 | ... | 15·9                         |
| Zymotic Death-rate                | ... | 2·2           | ... | 2·0                          |
| Infantile Mortality               | ... | 130·          | ... | 105·                         |
| Birth-rate                        | ... | 26·3          | ... | 33·9                         |
| Zymotic Case-rate                 | ... | 8·6           | ... | 10·0                         |

During the year Canvey Island has been added to this district. The marked increase in the population however is on account of the number of houses which have been erected in South Benfleet, Hadleigh, Hockley, Rayleigh and Thundersley, and is based upon a careful estimate made in connection with a proposed water scheme.

*Infectious Diseases.* Measles and whooping cough have been widely prevalent. Schools were closed in 5 parishes.



*Isolation Hospital.* Plans for a new hospital have been approved, and the Medical Officer of Health hopes the erection thereof will be proceeded with without delay as in the present building the accommodation is too limited. An ambulance has been ordered but not yet received.

*Water Supply.* There has been a great scarcity of water, practically throughout the whole district. During certain months it amounted to a famine in more than one parish. Water had to be brought from Low Street to South Benfleet by rail.

A firm of engineers have been consulted and propose the sinking of a deep well at South Benfleet to supply that parish and Hadleigh, Hawkwell, Hockley, Rayleigh, Rochford, and Thundersley. The scheme has been submitted to the Local Government Board for approval.

*Sewerage.* A number of minor improvements are chronicled. The sewage outfall works at Rochford have been re-constructed upon the plans prepared by an engineer but the result is not entirely successful.

*Scavenging.* The more frequent and regular removal of house refuse in Rochford is necessary.

### ROMFORD.

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

|                                   |     |       |     |                              |
|-----------------------------------|-----|-------|-----|------------------------------|
| Population, 1891                  | ... | ...   | ... | 16,042                       |
| „ 1898                            | ... | ...   | ... | 18,560                       |
| Deaths registered in the district | ... | ...   | ... | 250                          |
| Corrections                       | ... | ...   | ... | + 0 — 0                      |
|                                   |     |       |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898. | ... | 14.5                         |
| Zymotic Death-rate                | ... | 2.5   | ... | 2.4                          |
| Infantile Mortality               | ... | 119.  | ... | 129.                         |
| Birth-rate                        | ... | 29.6  | ... | 30.1                         |
| Zymotic Case-rate                 | ... | 6.8   | ... | 9.9 (6 yrs.)                 |

*Infectious Diseases.* Typhoid Fever was very prevalent in Dagenham and Beacontree Heath, localities where local nuisances from sewage are very prevalent. A special report was presented on this subject. Measles prevailed to a considerable extent over the whole of the district.

*Isolation Hospital.* The Romford Joint Hospital Board have acquired a suitable site and purpose erecting a hospital forthwith.

*Water Supplies.* The South Essex Company's mains furnish a supply of water to a large portion of the population in Dagenham, Beacontree Heath, Chadwell Heath, Collier Row, Havering, Noak Hill, Romford Common, Squirrells Heath, Hornchurch, Upminster, Cranham, Corbet's Tey, Great Warley, Rainham, and Wennington. Outlying portions of the parishes are supplied from wells, some of which are polluted. A part of Havering depends on ponds.

*Sewerage.* Many nuisances are referred to as being due to the pollution of the soil by leaky cesspits and cesspools. The portion of Hornchurch adjoining the town of Romford has been sewered. The sewage at the outfall is treated by the Septic tank process. At Great Warley this system has been adopted and is said, so far, to be a great success, the effluent after running over land in furrows being perfectly clear and odourless.

*Inspections.* A large number of inspections have been made and many nuisances detected. Whilst congratulating the Council upon the many sanitary improvements effected during recent years, the Medical Officer of Health says there are still many to effect, the chief being :—

A system of sewerage for the villages of Dagenham, Beacontree Heath, Rainham, Hornchurch and Harold Wood.



## SAFFRON WALDEN.

Medical Officer of Health—W. ARMISTEAD, M.B.

|                                   |     |       |     |                              |
|-----------------------------------|-----|-------|-----|------------------------------|
| Population, 1891                  | ... | ...   | ... | 12,458                       |
| Deaths registered in the district | ... |       |     | 154                          |
| Corrections                       | ... | ..    | ... | + 21 — 4                     |
|                                   |     |       |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898. | ... | 15·4                         |
| Zymotic Death-rate                | ... | 1·12  | ... | 1·2                          |
| Infantile Mortality               | ... | 147·  | ... | 85·                          |
| Birth-rate                        | ... | 20·16 | ... | 25·2                         |
| Zymotic Casc-rate                 | ... | 3·4   | ... | 6·2                          |

*Isolation Hospital.* A Joint Hospital Board has been formed for the management of the Hospital used by the Rural and Urban Districts.

*Sewerage.* An engineer has been consulted with reference to the sewage of Newport, but his scheme has not yet been carried out, the parish preferring to wait the result of the repairing and cleansing of the present sewers. Improvements have been effected at the outfall works for the joint villages of Rickling and Quendon.

*Water Supply.* A scheme has been prepared for providing a water supply from a deep well in the chalk for the village of Newport, and an application has been made to the Local Government Board for permission to borrow £1,500 to carry this out. The water will be pumped by an oil engine into a high level reservoir, holding 30,000 gallons. An application has also been made to the Local Government Board for permission to borrow £150 to provide a deep well for the parish of Langley. Several existing water supplies have been improved.

*Inspection.* Nine houses reported unfit for human habitation have been put in repair. One house has been closed. The regulations with reference to Dairies, Cowsheds and Milkshops have not been systematically enforced. 820 cottages have been inspected.

## STANSTED.

Medical Officer of Health—J. A. TURNER, M.B., D.P.H.

|                                   |     |              |     |                              |
|-----------------------------------|-----|--------------|-----|------------------------------|
| Population, 1891                  | ... | ...          | ... | 6,908                        |
| „ 1898                            | ... | ...          | ... | 8,958                        |
| Deaths registered in the district | ... |              |     | 76                           |
| Corrections                       | ..  | ...          | ... | + 11 — 0                     |
|                                   |     |              |     | Mean of 8 years,<br>1890-97. |
| Corrected Death-rate              | ... | 1898.<br>9·7 | ... | 13·7                         |
| Zymotic Death-rate                | ... | 1·1          | ... | 1·1                          |
| Infantile Mortality               | ... | 90·          | ... | 96·                          |
| Birth-rate                        | ... | 17·1         | ... | 25·0                         |
| Zymotic Case-rate                 | ... | 3·1          | ... | 6·1                          |

*Inspection.* The district has been systematically inspected, and a brief account is given of each parish.

*Water Supply.* All from wells and springs save a portion of Stansted Mountfitchet which is supplied by a water company.

*Drainage.* No system of sewers. In Stansted Mountfitchet most of the cesspools are emptied at the expense of the parish. A system of drainage is being considered.

*Public Scavenging.* None.

*Housing of the Working Classes.* In many parishes the report is not very satisfactory.

*Sanitary Improvements required.* Improved water supplies. Conversion of privies into pail closets. Surface drainage to prevent dampness of houses. A proper system of drainage and sewage disposal for Stansted Mountfitchet.

*Infectious Diseases.* An outbreak of scarlet fever occurred at Farnham and Diphtheria “continued to appear at Little Hallingbury.”

*Hospital Accommodation.* This has been much improved by the addition of bath-rooms, discharging rooms, observation wards, etc.



## TENDRING.

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

|                                   |     |     |     |          |
|-----------------------------------|-----|-----|-----|----------|
| Population, 1891                  | ..  | ... | ... | 20,034   |
| „ 1893                            | ... | ... | ... | 22,224   |
| Deaths registered in the district | ..  |     |     | 313      |
| Corrections                       | ..  | ... | ... | + 0 — 11 |

|                         |     | 1898. | Mean of 8 years,<br>1890-97. |
|-------------------------|-----|-------|------------------------------|
| Corrected Death-rate    | ... | 13·6  | .. 14·9                      |
| Zymotic Death-rate ..   | ... | 1·2   | .. 1·1                       |
| Infantile Mortality ... | ... | 107·  | .. 104·                      |
| Birth-Rate ...          | ... | 23·8  | .. 27·5                      |
| Zymotic Case-Rate ..    | ... | 2·6   | .. 5·3                       |

*Isolation Hospital.* The portable isolation hospital has been very useful. It was erected at Manningtree during the outbreak of Typhoid Fever.

*Infectious Diseases.* Twenty-five cases of Typhoid Fever were notified. The chief outbreak was at Manningtree and due to the insanitary condition of the houses, and the want of proper drainage. The sewage pollutes the river Stour. Several schools were closed on account of outbreaks of Measles, Mumps and Whooping Cough.

*Sewerage.* The sewerage of Manningtree requires immediate attention. The system at Frinton is now complete and has been working satisfactory for some months.

*Bye-laws.* A code of bye-laws has been adopted, and the Medical Officer of Health says “they are a distinct advantage to the district.”

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NOTE  
ON  
THE BACTERIOLOGICAL DIAGNOSIS OF  
DIPHTHERIA.

BY  
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County Council

SIR R. THORNE states, in his contribution on diphtheria to Dr. Allbutt's "System of Medicine," that "local diphtheria results from the reception at a particular point of the mucous membrane, and the subsequent development there, of a definite micro-organism—the Klebs-Löffler *Bacillus diphtheriæ*. This micro-organism, which is vegetable rather than animal in its nature, *must therefore be regarded as the particulate and essential cause of the local disease*. The general symptoms of diphtheria, on the other hand, are largely due to absorption into the system of a chemical poison or toxin, a result of the life-process of the bacillus."

The late Dr. Kanthack also stated: "The Klebs-Löffler bacillus is found in every case of diphtheria; and from the results of investigations made, we may say, all over the world, we must refuse to call any lesion diphtheria unless it is associated with that bacillus; conversely, any morbid process accompanied by this organism is diphtheria."

With these definitions of diphtheria by such eminent authorities, there can be little doubt as to the necessity for demonstrating the presence of the Klebs-Löffler bacillus in throats suspected to be diphtheritic. Again, the value of an early diagnosis is shown by the results obtained in the anti-toxin treatment of this disease. In all the statistics published of this method of treatment, we find that the earlier the treatment is begun, the greater is the percentage of recoveries.

Up till recent years any throat affection in which there was formation of a false membrane was termed diphtheria, and



even at the present time, as will be seen from an analysis of the 100 cases under discussion, a large number of cases are notified as diphtheria in which the presence of the Klebs-Löffler bacillus could not be discovered.

In many annual reports on the health of sanitary districts, the Medical Officers of Health are drawing attention to the above fact, and there appears to be a growing tendency among Sanitary Authorities to endeavour to provide the means for obtaining an early diagnosis of suspected cases. From the annual report of the Medical Officer of Health for Walthamstow, I give the following abstract: "That similar clinical conditions are not diagnosed as diphtheria by different medical men in your district is evident from the fact that twenty cases were notified as diphtherial by one medical practitioner in July and August, out of a total of forty-seven cases occurring in the whole district. I pointed out to your Sanitary Committee that there is no excuse for errors of diagnosis in this disease, and, as in the case of typhoid fever, arrangements were made with Dr. Thresh to furnish a bacteriological diagnosis to any medical practitioner in your district who wishes to avail himself of the opportunities offered. 'Culture outfits' are kept at the Town Hall, and notice has been sent to the doctors in your district to that effect."

Out of the last 100 cases sent to the laboratory of Dr. Thresh, the County Medical Officer of Health, we get the following results shown in tabular form:—

| Clinical Diagnosis.    | Number of cases in which the Klebs-Löffler bacillus was found. | Number of cases in which the Klebs-Löffler bacillus was absent. |
|------------------------|----------------------------------------------------------------|-----------------------------------------------------------------|
| Diphtheria - - -       | 44                                                             | 18                                                              |
| Pseudo-diphtheria - -  | 3                                                              | 5                                                               |
| Membranous croup - -   | 0                                                              | 1                                                               |
| Putrid sore throat - - | 0                                                              | 9                                                               |
| Tonsillitis - - -      | 1                                                              | 6                                                               |
| Influenza throat - -   | 0                                                              | 4                                                               |
| Diagnosis not stated - | 1                                                              | 8                                                               |
| Total -                | 49                                                             | 51                                                              |

Thus we find that out of sixty-two cases clinically diagnosed as diphtheria, in as many as eighteen, or 29 per cent., the Klebs-Löffler bacillus could not be demonstrated. Similarly in several cases in which the diagnosis was other than diphtheria the bacillus was found to be present. This can only lead us to the conclusion that many cases are notified as diphtheria which are not really so, necessitating a considerable amount of unnecessary isolation and inconvenience to the patients and their friends; and, on the other hand, that cases of true diphtheria, through errors of diagnosis, are occasionally allowed to mix freely with their fellows and disseminate the infection.

As a means also of ascertaining freedom from infection, bacteriological examination alone can be relied upon. Numerous are the recorded cases in which the Klebs-Löffler bacillus has been found weeks, and even months, after the throats of patients have regained their normal appearance. The attendance of such children at schools is a serious menace to the health of the district.

An abstract from the last annual report of the Medical Officer of Health for Woodford Urban District bears out the above statement: "The freedom of the district from the disease (diphtheria) was remarkable, more especially when its prevalence in our neighbouring districts is taken into account. There was no case in Woodford after May. I think some credit on this score may fairly be taken on account of the procedure which had, on my advice, been taken here. No scholar is allowed to attend a Board School after having had diphtheria until he or she has a certificate of freedom from infection based upon a bacteriological examination of secretion from the throat—the District Council paying, when necessary, fees for examination. I endeavour to have this practice carried out as much as possible in ordinary practice amongst others than scholars at the Board Schools, and have found, as a rule, medical practitioners quite ready and willing to carry it out.



I personally believe that by the *universal* adoption of this practice this disease might be very materially lessened, if not altogether stamped out."

Many medical practitioners in charge of isolation hospitals find a bacteriological examination of value as a means of saving anxiety about the time for permitting diphtheritic patients to leave the hospital.

TABLE OF POPULATION, BIRTHS, AND OF NEW CASES OF INFECTIOUS SICKNESS, coming to the knowledge of the Medical Officers of Health, during the year 1898, in the County of Essex; classified according to DISEASES, AGES and LOCALITIES.

| NAMES OF LOCALITIES. | POPULATION AT ALL AGES. |                              | Registered Births. | Aged under 5 or over 5. | NEW CASES OF SICKNESS IN EACH LOCALITY, COMING TO THE KNOWLEDGE OF THE MEDICAL OFFICER OF HEALTH. |             |             |                   |         |                     |            |            |          |         |                     |          | NUMBER OF SUCH CASES REMOVED FROM THEIR HOMES IN THE SEVERAL LOCALITIES FOR TREATMENT IN ISOLATION HOSPITAL. |         |            |             |             |                   |            |            |          |   |    |     |    |          |             |         |
|----------------------|-------------------------|------------------------------|--------------------|-------------------------|---------------------------------------------------------------------------------------------------|-------------|-------------|-------------------|---------|---------------------|------------|------------|----------|---------|---------------------|----------|--------------------------------------------------------------------------------------------------------------|---------|------------|-------------|-------------|-------------------|------------|------------|----------|---|----|-----|----|----------|-------------|---------|
|                      | Census 1891.            | Estimated to middle of 1898. |                    |                         | Small-pox.                                                                                        | Scarlatina. | Diphtheria. | Membranous Group. | FEVERS. |                     |            |            |          |         |                     | Cholera. | Erysipelas.                                                                                                  | Totals. | Small-pox. | Scarlatina. | Diphtheria. | Membranous Group. | FEVERS.    |            |          |   |    |     |    | Cholera. | Erysipelas. | Totals. |
|                      |                         |                              |                    |                         |                                                                                                   |             |             |                   | Typhus. | Enteric or Typhoid. | Continued. | Relapsing. | Purpura. | Typhus. | Enteric or Typhoid. |          |                                                                                                              |         |            |             |             |                   | Continued. | Relapsing. | Purpura. |   |    |     |    |          |             |         |
| URBAN.               |                         |                              |                    |                         |                                                                                                   |             |             |                   |         |                     |            |            |          |         |                     |          |                                                                                                              |         |            |             |             |                   |            |            |          |   |    |     |    |          |             |         |
| BARKING              | 14,301                  | 20,000                       | 724                | Under 5 5 wds.          | 21                                                                                                | 12          | 4           | 1                 | 31      | 1                   | 1          | 1          | 1        | 1       | 39                  | 12       | 9                                                                                                            | 3       | 1          | 1           | 20          | 1                 | 1          | 1          | 1        | 1 | 1  | 1   | 25 |          |             |         |
| BRAINTREE            | 5,303                   | 5,400                        | 118                | Under 5 5 wds.          | 48                                                                                                | 57          | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 159                 | 32       | 30                                                                                                           | 1       | 1          | 20          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 84  |    |          |             |         |
| BRIGHTLINGSEA        | 3,882                   | 4,295                        | 118                | Under 5 5 wds.          | 70                                                                                                | 17          | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 93                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BUCKHURST HILL       | 4,130                   | 4,700                        | 99                 | Under 5 5 wds.          | 1                                                                                                 | 6           | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 11                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BURNHAM              | 2,476                   | 2,976                        | 118                | Under 5 5 wds.          | 6                                                                                                 | 3           | 1           | 1                 | 18      | 1                   | 1          | 1          | 1        | 1       | 27                  | 1        | 1                                                                                                            | 1       | 1          | 15          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 17  |    |          |             |         |
| CLACTON              | 3,584                   | 6,002                        | 137                | Under 5 5 wds.          | 1                                                                                                 | 1           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 3                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| CHELMSFORD           | 11,008                  | 11,977                       | 325                | Under 5 5 wds.          | 2                                                                                                 | 3           | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 10                  | 1        | 1                                                                                                            | 1       | 1          | 5           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| CHINGFORD            | 2,737                   | 3,682                        | 91                 | Under 5 5 wds.          | 10                                                                                                | 13          | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 30                  | 6        | 34                                                                                                           | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 3   |    |          |             |         |
| COLECHESTER          | 2,737                   | 3,682                        | 91                 | Under 5 5 wds.          | 7                                                                                                 | 12          | 1           | 1                 | 9       | 1                   | 1          | 1          | 1        | 1       | 2                   | 1        | 1                                                                                                            | 1       | 1          | 4           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 7   |    |          |             |         |
| EAST HAM             | 34,559                  | 40,710                       | 969                | Under 5 5 wds.          | 8                                                                                                 | 7           | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 20                  | 2        | 20                                                                                                           | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| EFFING               | 34,559                  | 40,710                       | 969                | Under 5 5 wds.          | 54                                                                                                | 38          | 1           | 1                 | 20      | 1                   | 1          | 1          | 1        | 1       | 38                  | 1        | 2                                                                                                            | 1       | 1          | 10          | 17          | 1                 | 1          | 1          | 1        | 1 | 1  | 3   |    |          |             |         |
| GRAYS                | 32,710                  | 70,000                       | 2,014              | Under 5 5 wds.          | 168                                                                                               | 81          | 6           | 1                 | 6       | 1                   | 1          | 1          | 1        | 1       | 369                 | 10       | 17                                                                                                           | 1       | 1          | 2           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 30  |    |          |             |         |
| HALSTEAD             | 3,318                   | 3,396                        | 93                 | Under 5 5 wds.          | 406                                                                                               | 129         | 1           | 1                 | 72      | 1                   | 1          | 1          | 1        | 1       | 659                 | 54       | 23                                                                                                           | 1       | 1          | 22          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 78  |    |          |             |         |
| ILFORD               | 12,087                  | 14,750                       | 407                | Under 5 5 wds.          | 3                                                                                                 | 1           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 4                   | 46       | 29                                                                                                           | 1       | 1          | 1           | 4           | 5                 | 1          | 1          | 1        | 1 | 1  | 207 |    |          |             |         |
| LEIGH-ON-SEA         | 12,087                  | 14,750                       | 407                | Under 5 5 wds.          | 1                                                                                                 | 6           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 5                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| ROMFORD              | 6,036                   | 6,900                        | 145                | Under 5 5 wds.          | 12                                                                                                | 6           | 1           | 1                 | 15      | 1                   | 1          | 1          | 1        | 1       | 24                  | 1        | 1                                                                                                            | 1       | 1          | 3           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| SAFFRON WALDEN       | 6,036                   | 6,900                        | 145                | Under 5 5 wds.          | 33                                                                                                | 8           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 89                  | 16       | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 20  |    |          |             |         |
| WALTHAMSTOW          | 8,403                   | 8,703                        | 302                | Under 5 5 wds.          | 5                                                                                                 | 1           | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 6                   | 5        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 7   |    |          |             |         |
| WYVENHOE             | 8,403                   | 8,703                        | 302                | Under 5 5 wds.          | 6                                                                                                 | 1           | 1           | 1                 | 8       | 1                   | 1          | 1          | 1        | 1       | 21                  | 6        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 6   |    |          |             |         |
| BELCHAMP             | 10,913                  | 27,178                       | 697                | Under 5 5 wds.          | 7                                                                                                 | 1           | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 13                  | 6        | 1                                                                                                            | 1       | 2          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 9   |    |          |             |         |
| BILLERICAY           | 2,108                   | 3,750                        | 102                | Under 5 5 wds.          | 77                                                                                                | 66          | 1           | 1                 | 33      | 1                   | 1          | 1          | 1        | 1       | 206                 | 1        | 1                                                                                                            | 1       | 1          | 4           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 4   |    |          |             |         |
| BRAINTREE            | 2,108                   | 3,750                        | 102                | Under 5 5 wds.          | 10                                                                                                | 10          | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 10                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BRIGHTLINGSEA        | 63,220                  | 90,000                       | 2,560              | Under 5 5 wds.          | 21                                                                                                | 25          | 1           | 1                 | 21      | 1                   | 1          | 1          | 1        | 1       | 61                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BUCKHURST HILL       | 1                       | 351                          | 162                | Under 5 5 wds.          | 81                                                                                                | 8           | 1           | 1                 | 8       | 1                   | 1          | 1          | 1        | 1       | 709                 | 139      | 40                                                                                                           | 1       | 1          | 8           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 187 |    |          |             |         |
| BURNHAM              | 5,383                   | 5,729                        | 109                | Under 5 5 wds.          | 4                                                                                                 | 1           | 1           | 1                 | 4       | 1                   | 1          | 1          | 1        | 1       | 9                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| CLACTON              | 5,383                   | 5,729                        | 109                | Under 5 5 wds.          | 6                                                                                                 | 8           | 1           | 1                 | 4       | 1                   | 1          | 1          | 1        | 1       | 15                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| CHELMERSFORD         | 8,408                   | 10,500                       | 300                | Under 5 5 wds.          | 16                                                                                                | 15          | 1           | 1                 | 18      | 1                   | 1          | 1          | 1        | 1       | 60                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| CHINGFORD            | 6,104                   | 6,134                        | 137                | Under 5 5 wds.          | 1                                                                                                 | 10          | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 1                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| COLECHESTER          | 2,290                   | 4,128                        | 137                | Under 5 5 wds.          | 3                                                                                                 | 2           | 1           | 1                 | 5       | 1                   | 1          | 1          | 1        | 1       | 8                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| EAST HAM             | 13,242                  | 22,583                       | 603                | Under 5 5 wds.          | 6                                                                                                 | 2           | 1           | 1                 | 27      | 1                   | 1          | 1          | 1        | 1       | 37                  | 2        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 4   |    |          |             |         |
| EFFING               | 13,242                  | 22,583                       | 603                | Under 5 5 wds.          | 18                                                                                                | 16          | 2           | 1                 | 5       | 1                   | 1          | 1          | 1        | 1       | 42                  | 12       | 7                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 21  |    |          |             |         |
| GRAYS                | 81                      | 28                           | 3                  | Under 5 5 wds.          | 81                                                                                                | 28          | 3           | 1                 | 100     | 1                   | 1          | 1          | 1        | 1       | 223                 | 65       | 15                                                                                                           | 1       | 1          | 53          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 133 |    |          |             |         |
| HALSTEAD             | 5                       | 3                            | 1                  | Under 5 5 wds.          | 7                                                                                                 | 20          | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 38                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| ILFORD               | 92                      | 85                           | 5                  | Under 5 5 wds.          | 201                                                                                               | 149         | 4           | 1                 | 72      | 1                   | 1          | 1          | 1        | 1       | 197                 | 11       | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 12 |     |    |          |             |         |
| LEIGH-ON-SEA         | 46,346                  | 80,000                       | 2,294              | Under 5 5 wds.          | 3                                                                                                 | 17          | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 491                 | 4        | 2                                                                                                            | 1       | 1          | 11          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 15  |    |          |             |         |
| ROMFORD              | 7,042                   | 7,950                        | 160                | Under 5 5 wds.          | 57                                                                                                | 12          | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 83                  | 3        | 2                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 5   |    |          |             |         |
| SAFFRON WALDEN       | 1,586                   | 1,649                        | 39                 | Under 5 5 wds.          | 1                                                                                                 | 2           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 3                   | 17       | 8                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 25  |    |          |             |         |
| WALTHAMSTOW          | 3,228                   | 3,400                        | 70                 | Under 5 5 wds.          | 1                                                                                                 | 4           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 5                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| WYVENHOE             | 11,024                  | 13,837                       | 345                | Under 5 5 wds.          | 11                                                                                                | 12          | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 15                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| RURAL.               |                         |                              |                    |                         |                                                                                                   |             |             |                   |         |                     |            |            |          |         |                     |          |                                                                                                              |         |            |             |             |                   |            |            |          |   |    |     |    |          |             |         |
| BELCHAMP             | 5,722                   | 5,722                        | 103                | Under 5 5 wds.          | 3                                                                                                 | 1           | 3           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 7                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BILLERICAY           | 20,564                  | 20,564                       | 459                | Under 5 5 wds.          | 11                                                                                                | 4           | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 26                  | 17       | 1                                                                                                            | 1       | 1          | 12          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 30  |    |          |             |         |
| BRAINTREE            | 19,734                  | 19,734                       | 393                | Under 5 5 wds.          | 33                                                                                                | 13          | 1           | 1                 | 29      | 1                   | 1          | 1          | 1        | 1       | 92                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BURNHAM              | 2,886                   | 2,886                        | 55                 | Under 5 5 wds.          | 20                                                                                                | 8           | 1           | 1                 | 9       | 1                   | 1          | 1          | 1        | 1       | 30                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| CHELMERSFORD         | 23,174                  | 23,603                       | 523                | Under 5 5 wds.          | 65                                                                                                | 36          | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 128                 | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| DUNSTON              | 16,674                  | 16,674                       | 374                | Under 5 5 wds.          | 3                                                                                                 | 1           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 15                  | 6        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| EFFING               | 15,932                  | 16,873                       | 434                | Under 5 5 wds.          | 12                                                                                                | 7           | 1           | 1                 | 18      | 1                   | 1          | 1          | 1        | 1       | 14                  | 4        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 5   |    |          |             |         |
| HALSTEAD I.          | 4,762                   | 4,999                        | 99                 | Under 5 5 wds.          | 43                                                                                                | 5           | 1           | 1                 | 15      | 1                   | 1          | 1          | 1        | 1       | 7                   | 22       | 1                                                                                                            | 1       | 1          | 10          | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 32  |    |          |             |         |
| HALSTEAD II.         | 6,084                   | 6,084                        | 143                | Under 5 5 wds.          | 5                                                                                                 | 31          | 1           | 1                 | 4       | 1                   | 1          | 1          | 1        | 1       | 54                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| LEXDEN AND WINSTREE  | 19,206                  | 21,087                       | 509                | Under 5 5 wds.          | 3                                                                                                 | 3           | 1           | 1                 | 11      | 1                   | 1          | 1          | 1        | 1       | 6                   | 2        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| MALDON               | 15,623                  | 15,710                       | 457                | Under 5 5 wds.          | 29                                                                                                | 24          | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 75                  | 12       | 12                                                                                                           | 1       | 2          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| ONGAR                | 10,537                  | 10,557                       | 237                | Under 5 5 wds.          | 19                                                                                                | 7           | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 28                  | 6        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 6   |    |          |             |         |
| OSWERT               | 14,378                  | 16,774                       | 544                | Under 5 5 wds.          | 7                                                                                                 | 1           | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 16                  | 7        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| ROMFORD              | 11,544                  | 14,524                       | 383                | Under 5 5 wds.          | 14                                                                                                | 16          | 1           | 1                 | 1       | 1                   | 1          | 1          | 1        | 1       | 54                  | 6        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 6   |    |          |             |         |
| SAFFRON WALDEN       | 16,042                  | 18,560                       | 551                | Under 5 5 wds.          | 4                                                                                                 | 2           | 1           | 1                 | 16      | 1                   | 1          | 1          | 1        | 1       | 6                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| STANSTED             | 12,438                  | 12,438                       | 251                | Under 5 5 wds.          | 22                                                                                                | 2           | 1           | 1                 | 2       | 1                   | 1          | 1          | 1        | 1       | 54                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| TENDRING             | 6,908                   | 8,958                        | 154                | Under 5 5 wds.          | 3                                                                                                 | 1           | 1           | 1                 | 3       | 1                   | 1          | 1          | 1        | 1       | 4                   | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BELCHAMP             | 20,034                  | 22,224                       | 531                | Under 5 5 wds.          | 11                                                                                                | 8           | 1           | 1                 | 39      | 1                   | 1          | 1          | 1        | 1       | 96                  | 2        | 3                                                                                                            | 1       | 7          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BILLERICAY           | 11,544                  | 14,524                       | 383                | Under 5 5 wds.          | 10                                                                                                | 2           | 1           | 1                 | 39      | 1                   | 1          | 1          | 1        | 1       | 12                  | 1        | 1                                                                                                            | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 1   |    |          |             |         |
| BRAINTREE            | 16,042                  | 18,560                       | 551                | Under 5 5 wds.          | 39                                                                                                | 14          | 1           | 1                 | 37      | 1                   | 1          | 1          | 1        | 1       | 29                  | 21       | 113                                                                                                          | 1       | 1          | 1           | 1           | 1                 | 1          | 1          | 1        | 1 | 1  | 12  |    |          |             |         |
| CHELMERSFORD         | 12,438                  | 12,438                       | 251                | Under 5 5 wds.          | 33                                                                                                | 25          | 1           | 1                 | 37      | 1                   | 1          | 1          | 1        |         |                     |          |                                                                                                              |         |            |             |             |                   |            |            |          |   |    |     |    |          |             |         |



TABLE OF DEATHS during the year 1898, in the URBAN and RURAL Districts of the County of Essex, classified according to DISEASES, AGES and LOCALITIES.

| NAMES OF LOCALITIES. | (a.) | Deaths occurring outside the district among persons belonging to the district. | Deaths occurring within the district among persons not belonging to the district. | MORTALITY FROM ALL CAUSES AT SURVIVING AGES. |               |                |                 |                  |                  |                 | MORTALITY FROM SURVIVING CAUSES, DISTINGUISHING DEATHS OF CHILDREN UNDER FIVE YEARS OF AGE. |      |      |      |      |      |      |      |            |             |             |                   |         |                  |            |            |            |          |             |          |                 | TOTAL |                        |                  |           |                                      |                |            |           |                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                      |      |                                                                                |                                                                                   | At all Ages.                                 | Under 1 year. | 1 and under 5. | 5 and under 15. | 15 and under 25. | 25 and under 65. | 65 and upwards. | (b.)                                                                                        | (c.) | (d.) | (e.) | (f.) | (g.) | (h.) | (i.) | Small-pox. | Scarlatina. | Diphtheria. | Membranous Group. | FEVERS. |                  |            |            |            | Cholera. | Erysipelas. | Measles. | Whooping Cough. |       | Typhoid and Dysentery. | Rheumatic Fever. | Phthisis. | Bronchitis, Pneumonia, and Pleurisy. | Heart Disease. | Influenza. | Injuries. | All other diseases. |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                      |      |                                                                                |                                                                                   |                                              |               |                |                 |                  |                  |                 |                                                                                             |      |      |      |      |      |      |      |            |             |             |                   | Typhus. | Enteric Typhoid. | Continued. | Relapsing. | Puerperal. |          |             |          |                 |       |                        |                  |           |                                      |                |            |           |                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| URBAN.               |      |                                                                                |                                                                                   |                                              |               |                |                 |                  |                  |                 |                                                                                             |      |      |      |      |      |      |      |            |             |             |                   |         |                  |            |            |            |          |             |          |                 |       |                        |                  |           |                                      |                |            |           |                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BARKING              | 33   | 288                                                                            | 129                                                                               | 64                                           | 13            | 6              | 53              | 23               | Under 5          | 3               | 3                                                                                           |      |      |      |      |      |      |      |            |             |             |                   |         |                  |            |            |            |          |             |          |                 |       |                        |                  |           |                                      |                |            |           |                     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |