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ADMINISTRATIVE COUNTY OF ESSEX.

REPORT

OF THE

MEDICAL OFFICER OF HEALTH

FOR THE YEAR 1912

WITH

SUMMARY OF REPORTS OF DISTRICT MEDICAL OFFICERS OF HEALTH

BY

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PREFACE.

To the Chairman and Members of the Public Health and Housing Committee of the Essex County Council.

GENTLEMEN,

I have now the honour to submit to you my Annual Report (for the year 1912) on the Sanitary Condition and Administration of the various districts in the administrative County. This is the 23rd Report which I have presented and never before has it been so late in publication. This is due to two reasons. Certain local reports were not received until June and two only came in when much of the manuscript had been sent to the printer. Then the enormous amount of work entailed by the new Tuberculosis Department has left me so little leisure that I have had to write a section now and again as time permitted. Meantime the printer was anxious to liberate some of his type and the summaries were struck off with imperfect revision. A few printer's and other relatively unimportant errors will therefore be detected by the careful reader.

An enormous amount of work was done in the year under revision by your Committee, but this is recorded in the printed Minutes of the Meetings held on February 15th, April 18th, June 27th, July 18th, August 16th, September 5th, November 21st and December 11th. Voluminous as are these Minutes they give only a faint idea of the work done, since Sub-Committees met on many occasions, and the Chairman had constantly to be consulted as points of difficulty arose, and I desire here to record my gratitude to him for the courteous and sympathetic manner in which he invariably rendered me all the assistance in his power. He and your Committee also have done their utmost to develop the County Tuberculosis Scheme upon lines, which, it is believed, will secure the greatest benefit to the County at a minimum of cost.

The sanitary improvements effected each year in the County, and the marked increase in the zeal of the Sanitary Authorities must in great part be attributed to the activity of your Committee, and the results are patent to all who care to study the question. The great decrease in the general death-rate, the lessened infantile mortality, and the decreased prevalence of Infectious Diseases are chiefly due to improved sanitation and administration, and must far more than repay money and time expended. Take the case of the general death-rate alone. For the first three years during which I held office it averaged 16·5 per 1,000, and it was not unusual for districts to have rates as high as 19 and 20 per 1,000. During the last three years the average has only been 10·7, and a death-rate of 15 per 1,000 is now so rare as to be considered very excessive. We are saving, therefore, about 5·8 lives per 1,000 compared with the early nineties, and with a population of 1,000,000 this means a saving of 5,800 lives per annum. In other words, if the conditions which obtained about 1890 had not been improved there would have been last year about

6,000 more deaths than actually occurred. Deaths from infectious diseases have decreased in much larger proportion, in fact during 1912 the deaths from these diseases were, in proportion to the population, less than one-third of what they were in 1890. The mortality amongst infants has also greatly decreased, so that notwithstanding the great decrease in the birth-rate, the excess of births over deaths has not decreased to any alarming extent. The following Table from my first and last (the present) reports cannot fail to be of interest:—

	Death-rate.	Birth-rate.	Natural increase.	Death-rate from Infectious Diseases.	Infantile Mortality.
1890	15·7	29·3	13·6	2·04	127
1912	10·5	21·7	11 2	0·55	70·4
Differences ...	—5·2	—7·6	—2·4	1·49	56·6
Decrease per cent. ...	33 %	26 %	18 %	73 %	45 %

Surely a record of such results should give the greatest satisfaction to your Committee, to the County Council, and to the inhabitants of the County, and should reconcile the most strenuous advocate of economy, to the comparatively small expenditure which was necessary to render such an achievement possible. It should also encourage all Authorities to maintain a high degree of efficiency in sanitary administration, and it should encourage a few Authorities who are still behind hand to improve their administration and to execute works, which it has been pointed out to them are necessary in the interests of public health. It should be remembered that as man does not live for himself alone, so communities do not live for themselves alone. Lax administration in one area may affect every district around and even districts at a distance. An unrecognized or imperfectly isolated case of Fever or Smallpox, for example, may spread infection not only in the district in which it originated but in any other districts with which there is communication.

As an example of the good work done by exercising supervision over and tendering advice to Sanitary Authorities I may quote a few lines from the Report of Dr. Roberts, Medical Officer of Health for the Urban District of Halstead. After many years good work Dr. Roberts has ceased to act as Medical Officer of Health, a whole time officer having been recently appointed for a large combined area which includes Halstead. His report unfortunately was received too late to be summarised; it refers not only to the year 1912 but to work done during the whole time he has been the Medical Officer of Health. To understand the quotations it must be explained that Diphtheria used to be very prevalent in Halstead and that I was asked ultimately to report on the sanitary condition of the the town (1893). The death-rate at that time was always given as *over 20 per 1,000*. The report says "Dr. Thresh considers the correct figures as 18·3 per 1,000 . . . much too high a figure for a small country town with the many natural advantages Halstead enjoys."

"How far he was correct in his surmise may be gathered from the fact that for the past 6 years the mean death-rate was 13·25 and for the last year . . . 10·3"

"From the foregoing it will be readily appreciated that a vast amount of work had to be got through before the town reached the condition it is in now. The Sanitary Committee came into existence after the receipt of Dr. Thresh's report, and its minute books testify to what has been accomplished. Fortnightly meetings were necessary at first and a whole time Sanitary Officer (Inspector) was appointed . . . the drainage of the town was being condemned wholesale . . . Results however have more than justified the action of the Committee, and it must be gratifying to all concerned to feel that the death-rate of the town has been lowered nearly 40 per cent. as the result of their labours."

Halstead owes a debt of gratitude to Dr. Roberts. I found it a pleasure to be associated with him in thoroughly examining into the sanitary condition of the town and this having once been ascertained his enthusiasm reacted on the Council with the remarkable results above recorded.

Returning now to county matters generally it must be admitted that the Tuberculosis work has caused some other Public Health work to receive less attention during the past year than it otherwise would, but so far as I am aware no matter of any importance has been neglected.

Until last year the functions of your Medical Officer of Health were chiefly of an advisatory character and I was able to give all the time required for the discharge of these duties. Now the Medical Officer of Health has become the head of an Administrative Department, which has the expending of a considerable amount of public monies entrusted to its charge, and the work has increased to such an extent that I find it impossible to continue to act as Medical Officer of Health to a combination of rural districts also and I am glad of the prospect of being speedily relieved. The supervision of ten or more Dispensaries, of six Tuberculosis Officers, excellent and efficient as they are, of a series of Hospitals and Sanatoria to which the County is sending patients and the planning of a large central sanatorium is at present fairly within the limits of my powers, though the constant running to and fro and office supervision does not leave me much time for "thought." Some Medical Officers may think that I have neglected them or their districts as my formal visits have been fewer than in former years, but I hope that no one has serious cause for complaint. I am greatly indebted to the Medical Officers of Health for the valuable assistance they have rendered me, especially in organizing the tuberculosis campaign and for their courtesy whenever I have had to consult them. I hope all thoroughly understand that whilst the County Council must exercise control it is their desire to secure the assistance and co-operation of all Medical Officers of Health and of all Sanitary Authorities. It is only by the mutual co-operation of the local and county authorities that an efficient scheme can be carried out and all friction and overlapping of duties avoided.

So far this County has not lagged behind any other, and it is certainly far ahead of many, if it does not actually lead, and no effort of mine will be spared, in serving the Council to enable it, through your Committee to maintain this enviable position.

Finally I desire to thank my assistant, Dr. Troup, for his assistance in preparing the Tables and Summaries of Reports, and revising proofs, etc.

I have the honour to be, Gentlemen,

Your Obedient Servant,

JOHN C. THRESH,
County Medical Officer of Health.

CHELMSFORD,
September 20th, 1913.

ERRATA.

Page v., line 13	...	...	Case *should read*	cases.
,, vii., ,, 19	...	...	Desease	,,	disease.
,, viii., ,, 11	...	...	Daries	,,	dairies.
,, ix., ,, 2	from bottom		A	,,	an.
,, x., ,, 3	,,	,,	8,180	,,	8,186.
,, xxxi., ,, 6	...	...	London	,,	London's.
,, xli., ,, 3	...	...	Depends	,,	depend.
,, xli., ,, 10	...	...	Gread	,,	Great.
,, xlvii., ,, 17	...	...	Inspection	,,	infection.
,, xlix., ,, 8	...	...	Puerpural	,,	puerperal.

TABLE OF CONTENTS.

SECTION I.

SECTION II.

SECTION III.

LOCAL GOVERNMENT BOARD TABLES.

(End of Report.)

PORT SANITARY AREAS.

URBAN DISTRICTS.

RURAL DISTRICTS.

RURAL DISTRICTS—*continued.*

SECTION I.

POPULATION OF THE COUNTY.

The total population of the County as given in the Annual Reports is 1,086,340, increase of about 20,000 for the year. It will be observed that the estimated pulation of the Rural Districts is about 5,000 less than in the previous year. This lue to the fact that the Tilbury Urban District was formed during the year and its pulation of over 6,000 was taken from the Orsett rural area.

	Population. Census Returns. 1901.	1911.	Estimated population middle of 1912.
Urban Districts ...	576,508	796,571	825,535
Rural Districts ...	240,132	265,429	260,805
Whole County ...	816,640	1,062,000	1,086,340

The Registrar-General's census returns include certain Institutions, such as the aybury Asylum, which do not belong to the County, whereas the Medical Officers Health now exclude such places from their returns. The real increase in population nce the 1911 census will be about 6,000 more than is shewn by the above figures, or out 30,000 from April 2nd, 1911 to July 1st, 1912. Practically the whole of this crease is in the Urban Districts. The following districts are increasing most pidly :—

East Ham	increase	4,946
Leyton	,,	1,964
Southend	,,	4,561
Walthamstow	,,	3,883

The various statistics given in this report are based on the populations given ove. Lists of transferable deaths are sent to the County office every quarter and ese are allocated to the districts to which they belong, and sent on by me to the spective Medical Officers of Health. The number of such deaths averages about 00 per quarter, an appreciable proportion of the total number of deaths.

THE BIRTH-RATES.

The total number of births registered in 1912 was 23,562, of which 18,301 were the Urban Districts and 5,261 in the Rural Districts. The County birth-rate was erefore 21·7. This is 2·1 per 1,000 population less than the average for England nd Wales. The decrease was most marked in the Urban areas.

The districts with the highest and lowest birth-rates were :—

	Highest.		Lowest.
Shoeburyness	33·6	Buckhurst Hill ...	14·0
Barking	29·0	Epping U.	15·5
East Ham	25·8	Frinton	15·9
Walthamstow	24·5	Halstead R. II. ...	16·0

As remarked in my previous reports, the differences are not so great as the figures indicate, because of the different age distribution in the Urban and Rural Districts. There will be a larger proportion of people at child producing ages in Barking, East Ham, etc., than in the Rural areas. Naturally therefore, assuming that the fecundity of the married couples was the same there would be a higher birth-rate in proportion to the whole population in the Urban Districts than in the Rural areas. The differences observed, however, are far higher than can be accounted for in this way.

TABLE I.

BIRTH-RATES PER 1,000 POPULATION.

	1909.	1910.	1911.	1912.
Urban Districts	24·7	23·7	23·2	22·2
Rural Districts	23·2	21·4	20·7	20·2
Administrative County	24·0	23·1	22·6	21·7

THE DEATH-RATES.

The total number of deaths registered in the County corrected for all transferable deaths was 11,384, of which 8,286 belonged to the Urban and 3,098 to the Rural districts.

TABLE II.

DEATH-RATES PER 1,000 POPULATION.

	1909.	1910.	1911.	1912.
Urban Districts	11·0	9·95	11·7	10·0
Rural Districts	12·8	11·5	12·0	11·8
Administrative County	11·2	10·35	11·8	10·5
England and Wales	14·5	13·4	14·6	13·3

The Registrar-General has kindly furnished me with the following factors for correcting the death-rates of the Administrative County, and of the aggregates of Urban and Rural Districts in the County for differences of age and sex constitution of the population :—

Total of County	·9737
Aggregate of Urban Districts	1·0225
Aggregate of Rural Districts	·8464

These factors are based upon the populations enumerated in 1911, and only after correction do the death-rates for the County and for England and Wales become comparable. The corrected rates are therefore as under :—

Urban Death-rate	10·25
Rural Death-rate	10·0
County Death-rate	10·22
England & Wales Death-rate ...	13·3

The death-rate therefore in the Urban Districts is slightly higher than in the Rural, although before correction the reverse would appear to be the case, and the County rate is about 3·1 below that of England and Wales.

The very favourable position occupied by the Administrative County is shewn in the following Table. Only two counties shew a lower death-rate. One is the purely rural county of Rutland and the other a county which, like Essex, bounds the metropolis. That the counties, Middlesex, Hertfordshire, Essex, Kent and Surrey should have such exceedingly low death-rates is remarkable. London and the counties surrounding it form an area which must be nearly, if not actually, the healthiest portion of the habitable globe. Considering also that it is probably the most densely populated area in the world, the sanitary administration must be excellent and of this the country may justly be proud.

COUNTY DEATH-RATES CALCULATED FROM THE REGISTRAR-GENERAL'S RETURNS FOR THE YEAR 1912.

TABLE III.

(Death-rate for the Administrative County of Essex, from the returns of the Medical Officer of Health = **10·2**.)

County.	Death-rate.	County.	Death-rate.
Middlesex	9·7	Hampshire ...	11·9
Rutland	10·0	Derbyshire ...	11·9
Surrey	10·7	Bedfordshire ...	12·2
Essex	10·9	Northamptonshire ...	12·3
Hertfordshire ...	11·2	Huntingdonshire ...	12·3
Dorset	11·3	Westmoreland ...	12·4
Buckinghamshire ...	11·4	Oxfordshire ...	12·4
Wiltshire	11·5	Worcestershire ...	12·4
Kent	11·7	Somersetshire ...	12·5
Sussex	11·8	Lincolnshire ...	12·5
Berkshire	11·8	Leicestershire ...	12·6

TABLE III.—*continued.*

	Death-rate.		Death-rate.
Nottinghamshire ...	12·8	London	13·6
Shropshire	13·0	Cornwall ...	13·8
Cambridgeshire ...	13·0	Staffordshire ...	13·9
Cheshire	13·1	Yorkshire ...	14·0
Hertfordshire ...	13·2	Durham	14·2
Warwickshire ...	14·2	Suffolk	13·3
Northumberland ...	14·3	Gloucestershire ...	13·3
Cumberland... ...	15·2	Norfolk	13·4
Lancashire	15·4	Devonshire ...	13·5

The births exceeded the deaths by 10,015 in the Urban areas and by 2,163 in the Rural districts, a total excess of 12,178. This natural increase accounts for a little more than 50 per cent. of the total increase in the population during the year.

Whilst the birth-rate continues to be double that of the death-rate, it is possible that the falling birth-rate need cause little alarm. Those who have been alarmed may probably be reassured by the opinions expressed by Mr. Bateson, F.R.S., in his Herbert Spencer lecture delivered during the year. He says:—

"Infantile mortality is conventionally regarded by both statesmen and philanthropists as deplorable, without further inquiry. . . . Other public men profess indignation against the practice, almost universal among the more intelligent and provident classes in civilized countries, of limiting their families to two or three children. Have these patriots estimated what the pressure of the resources of the country would be if we mostly had six to ten children, as our parents had?

"We need not more of the fit, but fewer of the unfit. A high death-rate is often associated with a high birth-rate, but happily a low birth-rate and a low death-rate are quite compatible with each other.

"In the gloom which shrouds the future of civilized communities there is one fact which gives encouragement and hope, the decline in the birth-rate, associated as it now is with a decline in the death-rate also.

"We are in fact passing through a phase which is quite exceptional in the history of a species—exceptionally favourable if you will—and it is in a decline in the birth-rate that the most promising omen exists for the happiness of future generations."

As it is only the more intelligent and more provident classes who limit their families, it is obvious that unless some restraint is put upon the reproduction of the "unfit" that the omen for the happiness of future generations cannot be very favourable, consequently the greatest problem awaiting solution by our statesmen is the prevention of the reproduction of the unfit, and the Control of the Feeble-minded is undoubtedly a step in the right direction, but further effort will be required, as the feeble-minded do not include all those who must be regarded as "unfit."

The Registrar-General has supplied me with a Table of Factors for correcting, for age and sex distribution, the death-rates for each district in the County. This Table has been utilized for correcting the death-rates in Table XIV., and as it will be required by every Medical Officer of Health in the County it is reproduced here for their benefit :—

Factors for correcting the general death-rate, based upon the populations enumerated in 1911.

COUNTY OF ESSEX.

Urban Districts.		Rural Districts.	
Barking Town ...	1·0470	Belchamp	·7492
Braintree ...	·8898	Billericay	·9322
Brentwood ...	1·0142	Braintree	·7900
Brightlingsea ...	·8247	Bumpstead... ...	·7803
Buckhurst Hill ...	1·0003	Chelmsford... ...	·8243
Burnham-on-Crouch...	·8326	Dunmow	·7791
Chelmsford ...	·9273	Epping	·8920
Chingford ...	1·0334	Halstead	·8086
Clacton	·9625	Lexden and Winstree ...	·8150
Colchester ...	1·0097	Maldon	·8024
East Ham ...	1·0536	Ongar	·8953
Epping	·8126	Orsett before change 1/4/12	·9692
Frinton-on-Sea ...	1·1189	„ after „ „	·9601
Grays Thurrock ...	1·0762	Rochford	·8740
Halstead	1·8697	Romford	·9617
Harwich... ...	1·1101	Saffron Walden ...	·7812
Ilford	1·0637	Stansted	·8212
Leigh-on-Sea ...	·9580	Tendring	·8219
Leyton	1·0217		
Loughton ...	1·0138		
Maldon	·8281		
Romford... ...	·9491		
Saffron Walden ...	·8063		
Shoeburyness ...	1·0398		
Southend ...	1·0088		
Tilbury (created 1/4/12)	1·1022		
Waltham Holy Cross	1·0139		
Walthamstow ...	1·0646		
Walton-on-the-Naze	·9139		
Wanstead ...	1·0790		
Witham	·9005		
Wivenhoe ...	·8370		
Woodford ...	1·0246		

The highest and lowest uncorrected death-rates occurred in the following districts :—

		Highest.				Lowest.
Bumpstead R. ...	17·3	Corrected =	13·5	Brentwood ...	6·1	Corrected = 6·2
Witham U. ...	15·5	,,	14·0	Wanstead ...	6·7	,, 7·2
Braintree R. ...	15·3	,,	12·0	Tilbury ...	6·8	,, 7·6
Braintree U. ...	14·9	,,	13·3	Frinton ...	7·6	,, 8·5
Brightlingsea ...	14·7	,,	12·1	Epping U. ...	8·8	,, 7·1
Halstead R. II.	14·3	,,	11·5	Halstead R. I....	9·0	,, 7·3

The marked effect of the correction for age and sex is apparent, the high rates being reduced in every case and the low rates being increased in nearly every instance. Even when the corrections are made the variations in the different districts are very considerable, but the variation only affects areas with comparatively small populations, and they are chiefly accidental. When the average for a series of years is taken the variations are slight.

Comparing the death-rates in the Urban areas with a population of upwards of 50,000 the differences are less marked :—

				Corrected Average for last 5 years.
East Ham Death-rate ...	10·6	Corrected =	11·1 ...	12·0
Ilford ,, ...	8·3	,,	8·8 ...	9·3
Leyton ,, ...	10·6	,,	10·8 ...	11·0
Southend ,, ...	9·6	,,	9·7 ...	11·1
Walthamstow ,, ...	9·8	,,	10·4 ...	11·5

Ilford certainly appears to be the healthiest of our large Urban areas, and all these populous areas are nearly as salubrious as the Rural districts. Doubtless the advantages enjoyed in towns—due to pure water supplies, the provision of sewers and efficient scavenging arrangements—almost, but not quite, compensate for the greater aggregation of houses on space.

DEATHS AT VARIOUS AGE PERIODS.

The following table gives the percentage number of deaths which occurred at different ages in the Urban and Rural districts during 1910, 1911 and 1912. It will be observed that in both districts there was a decreased proportion of deaths amongst infants and an increased proportion between 25 and 65 in the last year. In the towns only a little more than ~~two-thirds~~ of the population reach the age of 65, whereas in the Rural areas nearly half the people exceed that age.

TABLE IV.

PERCENTAGE OF DEATHS AT VARIOUS AGES.

	1912		1911.		1910.	
	Urban Districts.	Rural Districts.	Urban Districts.	Rural Districts.	Urban Districts.	Rural Districts.
Under 1 year of age ...	15·9	11·1	21·7	15·7	18·8	13·2
Between 1 and 5 years ...	7·0	5·1	9·8	5·0	8·2	4·8
,, 5 ,, 15 ,, ...	4·1	2·8	4·5	2·1	3·7	2·4
,, 15 ,, 25 ,, ..	4·9	4·1	4·5	3·7	4·2	3·6
,, 25 ,, 65 ,, ...	36·5	29·5	31·7	27·7	33·9	28·0
Over 65 years	31·6	47·4	27·8	45·8	31·2	48·0
	100·0	100·0	100·0	100·0	100·0	100·0

INFANTILE MORTALITY.

The year 1912 was a particularly favourable one for infants. The summer was not unusually hot or dry and the winter was mild, consequently the infantile mortality was low, lower, I believe, than ever previously recorded in the County.

In the Urban districts 1,318 infants under 1 year died, and in the Rural 342, a total of 1,660, against 2,527 in the previous year. This great variation in infantile mortality is one of the chief causes of the variations in the general death-rate. The number of births has already been given, and from the number of births which occurred during the year and the number of infants under 1 year of age which died during the same period, both definite factors, the mortality per 1,000 births is calculated.

TABLE V.

INFANTILE MORTALITY.

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

	1909.	1910.	1911.	1912.
Urban Districts	83	77	110	72
Rural Districts	71	70	90·5	65
Administrative County	80	75	105	70·4
England and Wales	109	106	130	95

The infantile death-rate in the County is decidedly low, varying from 25 to 30 per 1,000 births below that of England and Wales. That the rates should be so low in the Urban districts is somewhat surprising, but there is no doubt that it is capable of considerable diminution.

The following table shews that whilst the proportion of deaths from most causes remains about the same, the proportion due to diarrhœal disease fluctuates enormously. The intimate connection between deaths from diarrhœa and the number of rainless days in the third quarter of the year has been referred to in previous reports.

TABLE VI.

DEATHS FROM DIFFERENT DISEASES AMONGST CHILDREN UNDER 1 YEAR OF AGE PER 1,000 BIRTHS.

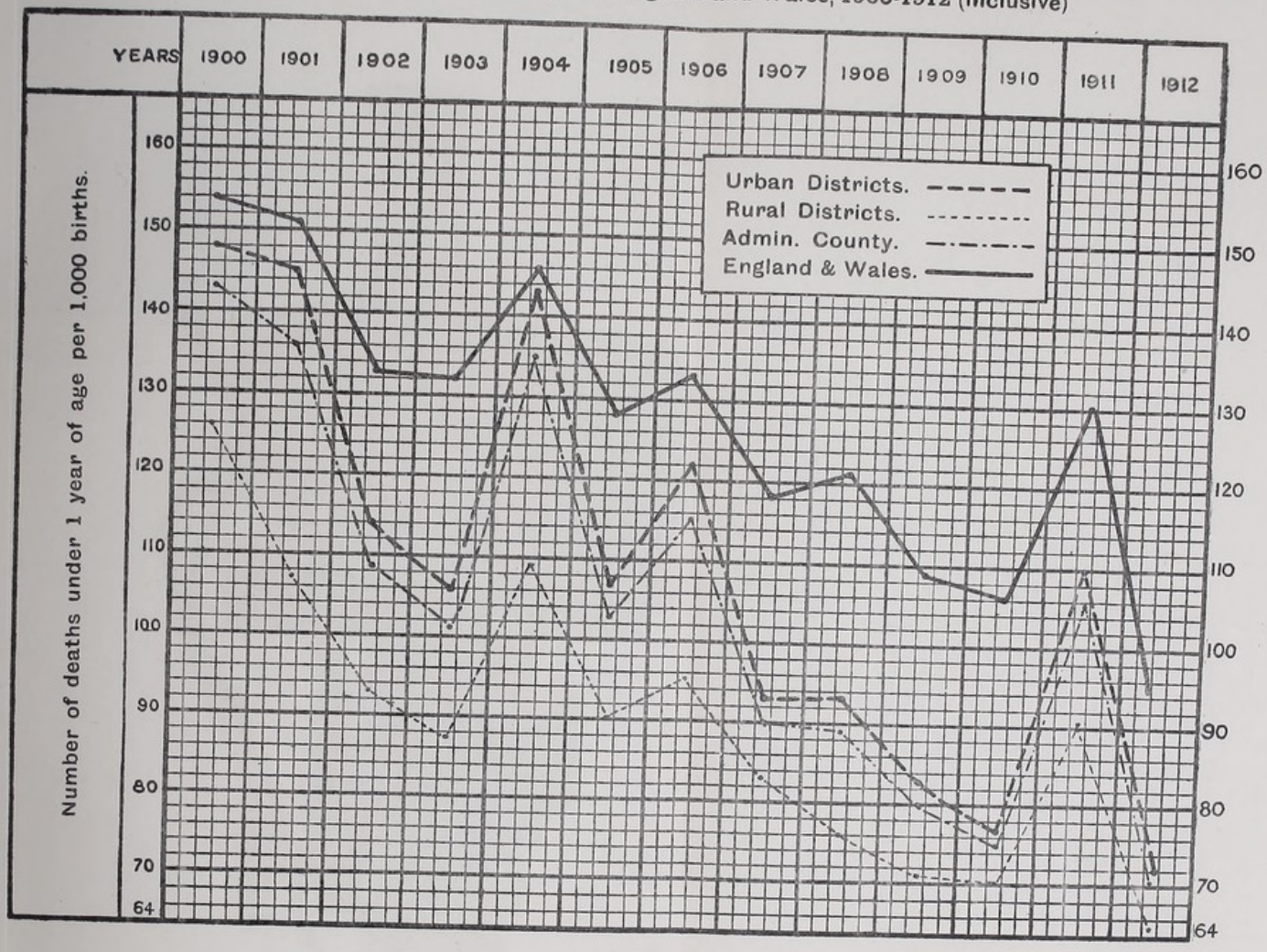
	1910.		1911.		1912.	
	Urban Districts.	Rural Districts.	Urban Districts.	Rural Districts.	Urban Districts.	Rural Districts.
Prematurity of Birth ...	18·1	16·8	16·7	18·1	15·4	16·3
Congenital Defects ...	5·7	6·5	3·4	3·1	4·9	2·6
Convulsions	4·1	6·4	3·6	5·9	4·0	5·2
Diarrhœa and Enteritis ..	6·35	1·9	35·6	22·2	4·9	3·2
Debility, &c.	13·5	10·3	15·9	9·1	12·4	10·8
Tubercular Diseases ...	2·6	2·1	3·9	3·4	2·4	·57
Injury at Birth	0·6	1·1	0·5	0·5	·39	1·52
Whooping Cough	...	...	...	...	4·6	3·9
Pneumonia	...	...	...	...	6·4	3·9
Bronchitis	...	...	...	...	5·8	6·1

About one-third of the infants dying before reaching the age of one year succumb before the expiration of the first week of life, and about half before the expiration of the first month, and it is noteworthy that these premature deaths are more common in the Rural than in the Urban districts.

The highest and lowest rates of mortality amongst infants occurred in the following districts:—

Highest.		Lowest.	
Barking ...	... 94	Brentwood. .	... 9
Walton-on-Naze	... 93	Brightlingsea	... 22
Tendring R.	... 91	Halstead U.	... 40
Chingford ...	... 86	Frinton ...	... 40
Clacton ...	... 86		
Grays ...	... 86		

Chart 1, showing INFANTILE MORTALITY in Urban and Rural Districts and Administrative County of Essex, and England and Wales, 1900-1912 (inclusive)



In a recent circular the Local Government Board remind Sanitary Authorities of the importance of taking all practicable measures for the prevention of diarrhœal and other diseases of childhood, and of promoting hygienic conditions in the feeding of infants. The Board points out the advantages accruing from the adoption of the Notification of Births Act, and that Authorities are empowered by the Public Health Act, 1875, to employ and pay women to visit the homes of lying-in women to give advice, etc., and suggests that where there is not sufficient work to employ the whole time of such an officer, that the person employed could act as assistant Inspector of Nuisances, Tuberculosis Visitor, or School Nurse.

In about two-thirds of the total districts in England and Wales the Notification of Births Act has been adopted, and the Board now suggest that in districts other than County Boroughs the County Council should consider the desirability of adopting the Act and of preparing a scheme, in consultation with the local councils, for the administration of the Act.

TABLE VII.

PERCENTAGE NUMBER OF DEATHS OF INFANTS UNDER 1 YEAR OF AGE FROM VARIOUS CAUSES.

	1910.		1911.		1912.	
	Urban Districts.	Rural Districts.	Urban Districts.	Rural Districts.	Urban Districts.	Rural Districts.
Dying before attaining the age of 1 week ...	28·5	33·0	19·6	25·9	28·3	35·1
,, between 1 week and 1 month	15·6	17·0	12·7	11·0	17·9	15·5
,, ,, 1 month and 3 months	16·6	16·7	17·1	17·2	17·9	19·0
,, ,, 3 months and 6 months	16·4	14·2	20·3	17·2	14·5	12·9
,, ,, 6 months and 12 months ...	22·9	19·1	30·3	28·7	21·4	17·5
	100·0	100·0	100·0	100·0	100·0	100·0

The Notification of Births Act has been adopted in the following districts:—

BARKING. Over 90 per cent. of the parents were visited by the female Assistant Inspector and School Nurse. "As an auxiliary scheme to the visiting . . . there has been established for the last two years a 'Babies Welcome.'" Mothers are encouraged to bring their babies whether ailing or not.

CLACTON. "The Health Visitor has been most useful in getting the children fed from the mother's breasts."

COLCHESTER. In this borough the Health Visitor pays at least three visits to each (?) new born child. The first within the first week, but after the third day; the second at the end of the first month; and the third when the baby is three months old. If it is found at the first visit that a doctor is in attendance upon the mother no

more visits are paid. The Act is said to work quite smoothly, although, at first, some of the medical men objected to it.

EAST HAM. The Health Visitor, finding it impossible to visit all births, limits her attention to those mothers whom she thinks most need advice, viz., those with first baby, mothers attended by midwives, etc. A baby clinic is largely attended and a Baby Show is held annually. "Short addresses on the care and management of children are also given to mothers."

GRAYS. No reference is made to the subject in the annual report.

ILFORD. The Act is said to have been of great benefit to the community The Health Visitor pays a visit to the house three weeks after the birth of the child if a doctor is in attendance, and ten to fifteen days after if a doctor is not attending. Further visits are paid if deemed desirable. Dried milk is supplied at reduced cost, and with very satisfactory results.

The above districts include nearly one-third of the population of the County. It is interesting to note the reasons given in other districts for not adopting the Act.

LEYTON. A Health Visitor is employed and "the adoption of the Notification of Births Act was again considered, but it was recognised that to make the Act of any real use it would be necessary to appoint another Health Visitor. Such a course, having regard to our low infantile mortality rate and the fact that most of the deaths of children under one year of age were attributable to ante-natal causes, was not considered to be justified."

WALTHAMSTOW. A great deal is done here without the adoption of the Act, by the Health Visitor and by ladies who volunteer assistance, and the Medical Officer of Health does not definitely recommend the adoption of the Act.

SOUTHEND. The Act has not been adopted in this important Borough and as the Medical Officer of Health does not refer to the subject it is obvious that he does not regard the Act as likely to be of any particular service to the community.

In the Rural District reports Dr. Cook is the only Medical Officer of Health who recommends the adoption of the Act. He thinks that such a course would, if followed up by visits from a lady inspector, be of benefit, as the inspector would encourage breast feeding.

In small Urban communities and in Rural Districts the administration of the Act would be comparatively expensive unless the Inspectors held some other compatible appointment, such as that of Tuberculosis Visitor or School Nurse. Dr. Cook's suggestion that the services of District Nurses should be utilized is also worthy of consideration. Had the infantile mortality in the County been "high" instead of "low" the probability of the County and of Sanitary Districts adopting the Act would have been much greater. Much can be done without the adoption of the Act where arrangements are made with the local registrars to supply, weekly, copies of the birth returns as is done in many districts.

DEATHS FROM VARIOUS CAUSES.

1. CANCER.

The mortality from this dread disease is still increasing. During the past year, one out of each eleven deaths in the Urban Districts, and one out of every ten in the Rural Districts was due to this cause. It causes more deaths than tuberculosis. The cancer death-rate in certain health resorts is in excess of the average, but this is doubtless due to persons in failing health being attracted to such places in the hope of prolonging life.

The disease is only curable, if at all, in its early stages, and there is no doubt that many lives could be saved were the disease recognised earlier. Unfortunately the researches being carried out have as yet led to no result of really practical importance and until the cause is discovered there is very little hope of our being able to arrest the disease. During the past 40 years the death-rate from Cancer has about doubled, and making all allowances for more careful diagnosis, the actual increase must have been very great.

In the following Tables the actual number of deaths recorded in the Urban and Rural districts and the death-rates for the County are given for a series of years:—

TABLE VIII.

DEATHS RECORDED FROM CANCER SINCE 1900.

	Rural Districts.	Urban Districts.	Administrative County.
1900	215	312	527
1901	220	344	562
1902	266	316	582
1903	246	367	613
1904	213	433	646
1905	245	476	721
1906	226	504	730
1907	249	369	618
1908	251	561	812
1909	270	578	848
1910	310	605	915
1911	282	683	965
1912	311	753	1064

TABLE IX.

CANCER DEATH-RATE PER 1,000 POPULATION.

	Administrative County.	England and Wales.
1871—80 ...	·48	·47
1881—90 ...	·54	·59
1891—1900 ...	·66	·75
1901—1905 ...	·71	·86
1906 ...	·76	·92
1907 ...	·63	·90
1908 ...	·84	·92
1909 ...	·86	·96
1910 ...	·88	·97
1911 ...	·91	
1912 ...	·98	

The excessive proportion of cases in the Rural Districts, 1·2 per 1,000 persons as against ·9 per 1,000 in the towns, does not indicate that town dwellers are less prone to the disease, but merely that cancer is most common amongst persons of mature age, and such persons are relatively more numerous in rural areas. If these could be corrected for age and sex distribution the death-rates in both districts would be very nearly the same, and a little below that for England and Wales.

2. PHTHISIS AND OTHER TUBERCULAR DISEASES.

The deaths attributed to this group of diseases may be tabulated as under :—

	1910.			1911.			1912.		
	Urban.	Rural.	Total.	Urban.	Rural.	Total.	Urban.	Rural.	Total.
Pulmonary Tuberculosis	611	189	800	703	181	884	638	171	809
Tubercular Meningitis ...	236	57	293	114	33	147	120	18	138
Other Tubercular Diseases				158	51	209	184	35	219
Totals ...	847	246	1093	957	265	1340	942	224	1166

It will be observed that 1911 was an exceptional year, many more deaths occurring from all tubercular diseases than in 1910 or 1912. The next table shews that the phthisis death-rate is decreasing, whilst the death-rate from other tubercular diseases remains nearly stationary.

TABLE X.

DEATH-RATES PER 1,000 POPULATION FROM TUBERCULAR DISEASES.

	From Phthisis.				From other Tubercular Diseases.			
	Urban.	Rural.	County.	England and Wales.	Urban.	Rural.	County.	England and Wales.
1901-10	·84	·78	·82	1·17	·39	·34	·37	·49
1910	·80	·72	·77	1·015	·30	·215	·28	·42
1911	·88	·68	·83	...	·34	·31	·335	...
1912	·77	·65	·74	...	·37	·21	·33	...

The next table shews the death-rate from phthisis for the 5 years 1907-11 in each of the sanitary districts in the County, and for convenience the districts have been arranged in order of diminishing death-rate. It will be noted that in the areas with large populations the death-rates for 1912 differ comparatively little from the average for the previous 5 years, whereas in the smaller areas the differences are often very great. This is an example of the necessity for taking an average for a series of years when studying the distribution of this or any other disease. It will be noted that in 12 out of the 33 Urban Districts the mortality is above the average for the whole of the towns, and in the Rural Districts 9 out of the 18 areas have a death-rate above the average. With the exception of Ilford all the largest Urban Districts have an excessive mortality from phthisis.

The causes of the difference in prevalence is now being studied by the various Tuberculosis Officers, and it is hoped that they will discover, for example, why Brentwood has only a death-rate of ·18 per 1,000, whilst Halstead has a rate of ·88 per 1,000. Here are two towns both on elevated sites, yet one has a phthisis mortality five times as great as the other.

TABLE XI.

AVERAGE DEATH-RATES FROM PHTHISIS IN EACH URBAN AND RURAL DISTRICT FOR THE 5 YEARS 1907-11 AND THE DEATH-RATES FOR 1912.

Urban Districts.	5 years average.	1912.	Rural Districts.	5 years average.	1912.
Leigh ...	1·44	·82	Dunmow ...	·97	·99
Barking ...	1·21	·86	Belchamp ...	·81	1·1
Southend ...	1·16	·98	Lexden and Winstree ...	·81	1·0
Grays ...	1·05	·61	Maldon ...	·81	·3
Clacton ...	1·03	·54	Ongar ...	·81	·56
Colchester ...	·96	·88	Saffron Walden ...	·81	·66
Epping ...	·91	·48	Braintree ...	·79	·86
Frinton ...	·90	·0	Chelmsford ...	·79	·39
Halstead ...	·88	1·1	Tendring ...	·76	·85
Walthamstow ...	·88	·83	Romford ...	·71	·69

TABLE XI.—*continued.*

Urban Districts.	5 years average.	1912.
Leyton	·87	·90
East Ham	·87	·74
Romford	·79	·73
Braintree	·78	1·3
Walton	·74	·86
Chingford	·71	·81
Witham	·70	·44
Chelmsford ...	·67	·34
Shoeburyness ...	·66	·59
Waltham Holy Cross ...	·65	1·0
Ilford	·64	·56
Maldon	·62	1·1
Buckhurst Hill ...	·62	·82
Brightlingsea ...	·58	·45
Harwich	·56	·43
Saffron Walden ...	·55	·47
Burnham	·51	·0
Wivenhoe	·50	2·0
Woodford	·50	·52
Loughton	·45	·90
Wanstead	·44	1·4
Brentwood ...	·18	·29

Rural Districts.	5 years average.	1912.
Rochford	·69	·43
Halstead	·68	·55
Orsett	·65	·43
Epping	·55	·49
Bumpstead	·54	·77
Billericay	·54	·41
Stansted	·49	·42

NOTE.—All the districts above the line have a death-rate from phthisis above the average for their respective districts, and those under the line have a death-rate below the average.

This table presents many points of interest, some of which have already been referred to. Another is the excessive mortality in our health resorts, Leigh, Southend, Clacton, and Frinton. This is not a matter for surprise and the explanation is simple. Persons in various stages of the disease flock to these places in the hope of prolonging life. Dr. Pugh, in his report on the Borough of Southend, estimates that two-thirds of the deaths from tuberculosis which occur in the Borough are of persons who were suffering from the disease when they took up residence there.

The determination of the causes of the great variations in the death-rates in other areas will necessitate the consideration of the part played by many factors, such as (1) the overcrowding of houses on space, (2) the overcrowding of persons in houses, (3) the character of the housing accommodation, (4) the occupations of the people and the conditions under which they work, (5) wages earned and proportion of persons whose earnings are low and precarious, (6) effect of alcoholism, and (7) the sanitary condition and administration.

What is being done by the County and the various Sanitary Authorities towards the control of tubercular disease will be referred to in a later section.

3. THE SEVEN PRINCIPAL ZYMOTIC DISEASES.

Deaths from these diseases reached a minimum in 1910, the number in that year being only about one-third the average for the previous 10 years. In 1911 there was an enormous increase, chiefly due to the prevalence of infantile diarrhœa. Last year comparatively few deaths occurred from this disease, and the total zymotic mortality fell below the average.

TABLE XII.

DEATHS FROM SEVEN PRINCIPAL ZYMOTIC DISEASES.

	1910	1911	1912
Small-pox	2	1	0
Measles	84	297	122
Scarlet Fever	38	29	28
Whooping Cough	161	142	223
Diphtheria	88	105	102
Fevers { Enteric Fever	16	47	26
Fevers { Puerperal Fever	17	24	28
Total	406	645	529
Epidemic Diarrhœa	113	1087	161
Grand Total...	519	1732	690

Table XIII. shews that during 1912 Measles caused about twice the average number of deaths in proportion to the population, Whooping Cough about the average number, whilst Diphtheria and Enteric and Puerperal Fevers only caused about half the average for the previous ten years.

TABLE XIII.

DEATH-RATES PER 1000 POPULATION FROM EACH OF THE SEVEN PRINCIPAL ZYMOTIC DISEASES, 1912.

	Small-pox.	Measles.	Scarlet Fever.	Whooping Cough.	Diphtheria.	Enteric and other Fevers.	Diarrhœa.	Totals.
Urban Districts	·00	·12	·02	·21	·10	·02	·11	·59
Rural Districts	·00	·07	·03	·18	·06	·02	·06	·43
Administrative County	·00	·11	·02	·20	·09	·02	·09	·55
England and Wales	·00	0·35	0·05	0·23	0·11	0·04	0·20	·99
Administrative County, 1901-1910	·013	·19	·07	·24	·20	·09	·47	1·27

TABLE XIV.

BIRTH-RATES AND DEATH-RATES.

	URBAN DISTRICTS.	Birth-rate.	Infantile Mortality	Death-rates from			Medical Officers of Health.
				* All causes.	Cancer.	Phthisis.	
1	Barking	29·0	93·8	10·6	·70	·86	R. J. Ewart, M.D., D.P.H.
2	Braintree	21·4	53·0	13·3	·32	1·3	P. R. Stevens, M.R.C.S., L.R.C.P.
3	Brentwood	16·2	8·7	6·2	·43	·29	S. Frazer, L.R.C.P., L.R.C.S,
4	Brightlingsea	20·7	21·9	12·1	1·4	·45	E. P. Dickin, M.B., C.M.
5	Buckhurst Hill	14·0	58·0	9·1	1·8	·82	C. R. Dykes, M.R.C.S., L.R.C.P.
6	Burnham	18·3	50·8	11·5	2·1	—	T. D. White, L.S.A.
7	Chelmsford	19·6	69·4	8·9	1·0	·54	H. W. Newton, M.R.C.S., L.R.C.P., D.P.H.
8	Chingford	21·3	86·5	9·7	·92	·34	T. S. Brook, M.R C.S., L.R.C.P.
9	Clacton	16·4	86·4	9·2	·71	·81	J. W. Cook, M.D.
10	Colchester	19·7	64·1	10·7	1·0	·88	W. Corfield, M.D., D.P.H.
11	East Ham	25·8	71·0	11·1	·77	·74	W. Benton, M.R.C.S., L R.C.P., D.P.H.
12	Epping	15·5	46·1	7·1	·96	·48	T. Fowler, L.R C.P. & S.I., D.P.H.
13	Frinton	15·9	40·0	8·5	1·9	—	H. W. Godfrey, M.D.
14	Grays	24·4	86·0	10·7	·91	·61	J. A. Ward, M.D.
15	Halstead	16·03	39·6	9·0	1·9	1·1	C. G. Roberts, M.A., M.B., B.C.
16	Harwich	24·3	73·5	12·9	·83	·43	H. Gurney, M.R.C.S., L.R.C.P.
17	Ilford	19·4	63·0	8·7	·97	·56	C. F. Stovin, M.A., L.S.A., D.P.H.
18	Leigh-on-Sea	16·4	85·1	10·7	1·0	·82	W. D. Watson, D.P.H., M.R.C.S., L.R.C.P.
19	Leyton	22·1	79·7	10·8	·73	·90	J. F. Taylor, M.R.C.S., D.P.H.
20	Loughton	19·0	66·6	10·8	1·1	·90	A. B. Harris, M.A., M.B., B.Ch.
21	Maldon	17·8	70·0	11·5	1·5	1·1	H. R. Brown, M.D., C.M.
22	Romford	22·2	84·4	9·5	·91	·73	A. Wright, M.R.C.S.
23	Saffron Walden...	17·3	45·0	7·6	1·5	·47	W. Armistead, M.B., F.C.S.
24	Shoeburyness	33·6	70·1	8·7	·19	·59	M. H. Raper, M.D., D.P.H.
25	Southend-on-Sea	19·47	56·4	9·7	1·2	·98	C. Grant Pugh, M.D., B.Sc., D.P.H.
26	Tilbury	18·6	45 8	7·5	·28	·28	A. H. Fowler, M.R.C.S., L.R.C.P.
27	Waltham Holy Cross	17·4	67·2	10·0	1·2	1·0	J. Damer-Priest, M.R.C.S., D.P.H.
28	Walthamstow	24·5	77·1	10·4	·88	·83	J. J. Clarke, L.R.C.P., L.S.A., D.P.H.
29	Walton-on-the-Naze	19·6	93·0	9·9	·46	~~1·1~~ ·84	J. C. Brockwell, M.R.C.S., L.R.C.P.
30	Wanstead	17·7	46·3	7·2	·70	~~·41~~ ·44	F. Argles, M.R.C.P., M.R.C.S.
31	Witham	17·2	50·0	14·0	2·3	~~·86~~ ·44	K. C. Gimson, M.B., B.Ch.
32	Wivenhoe	16·4	73·1	10·4	·80	2·0	G. T. Kevern, M.R.C.S., L.R.C.P
33	Woodford	18·6	81·6	9·4	·94	~~·5·2~~ ·52	W. G. Groves, M.R.C.S.
	Urban Rates	22·2	72·0	10·25	·91	·77	

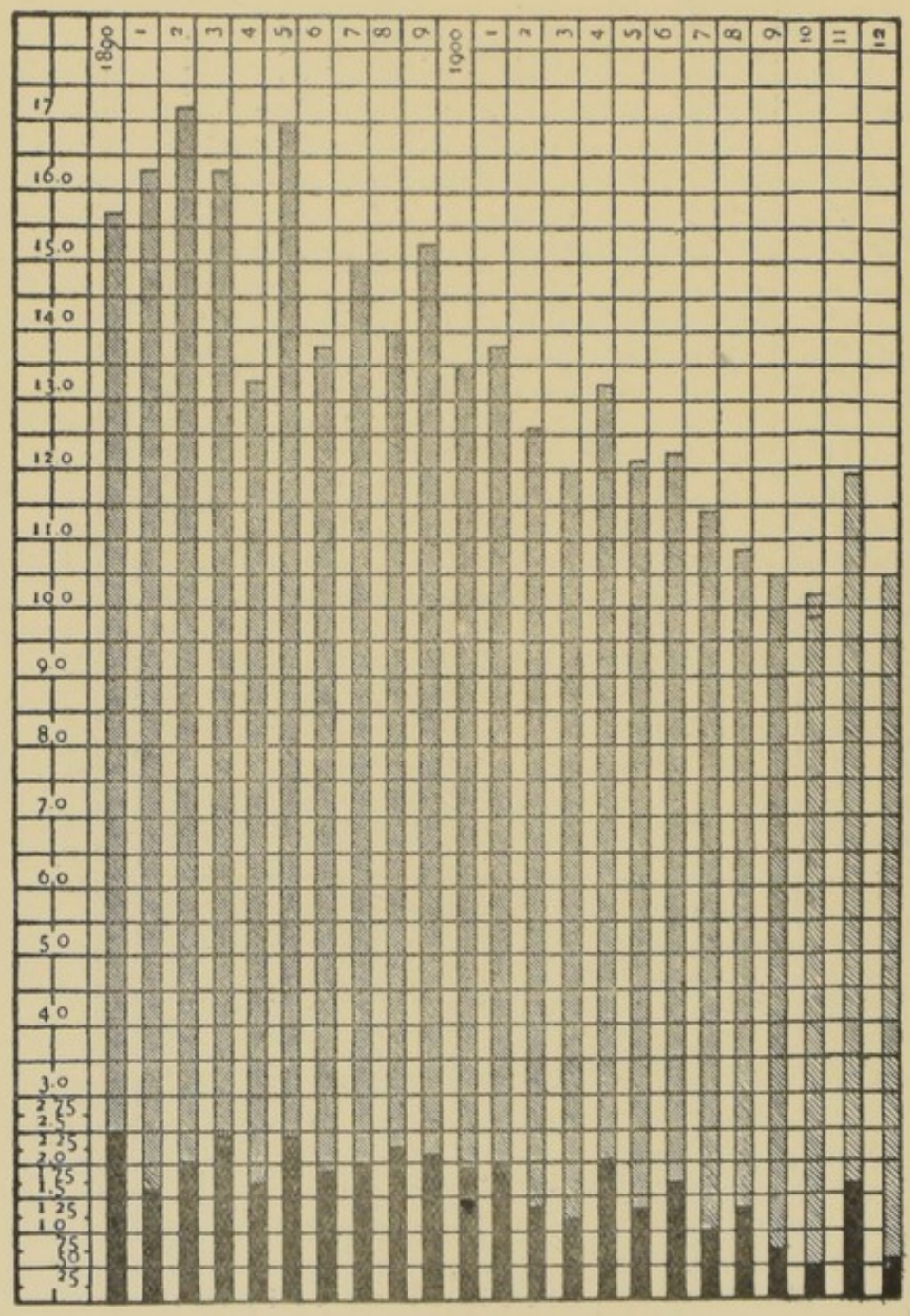
*Corrected for age and sex distribution.

TABLE XIV.—Continued.

BIRTH-RATES AND DEATH-RATES.

	RURAL DISTRICTS	Birth-rate.	Infantile Mortality	Death-rates from			Medical Officers of Health.
				* All causes.	Cancer.	Phthisis.	
1	Belchamp	17·9	71·4	10·6	1·5	1·1	J. S. Holden, M.D.
2	Billericay	17·7	46·9	8·5	·74	·41	D. Wells, M.B., Ch.B.
3	Braintree	17·2	78·6	12·1	1·4	·86	H. G. K. Young, M.R.C.S., L.R.C.P.
4	Bumpstead	23·1	66·0	13·5	2·7	·77	W. Armistead, M.B., F.C.S.
5	Chelmsford	22·4	73·5	9·7	1·2	·39	J. C. Thresh, M.D., D.Sc., D.P.H.
6	Dunmow	19·8	68·5	11·0	1·7	·99	E. E. Goodbody, M.D., D.P.H.
7	Epping	19·2	47·7	10·6	1·3	·49	T. Fowler, L.R.C.P. & S.I., D.P.H.
8	Halstead No. 1.	16·0	39·0	7·3	1·4	·21	J. H. Ashworth, M.D.
9	Halstead No. 2.	21·3	83·3	11·6	·89	·71	J. B. Bromley, M.R.C.S.
10	Lexden and Winstree	20·3	46·9	9·6	1·5	1·0	J. W. Cook, M.D.
11	Maldon	20·9	67·4	11·0	1·3	·8	J. C. Thresh, M.D., D.Sc., D.P.H.
12	Ongar	19·5	62·2	8·6	1·4	·56	A. S. David, M.R.C.S., D.P.H.
13	Orsett	23·2	56·0	9·5	1·2	·43	W. Allingham, M.R.C.S., L.R.C.P.
14	Rochford	20·7	59·8	8·3	·86	·43	M. H. Raper, M.D., D.P.H.
15	Romford	21·9	70·1	9·3	·80	·69	A. Wright, M.R.C.S.
16	Saffron Walden	18·8	59·0	11·0	1·7	·66	W. Armistead, M.B., F.C.S.
17	Stansted	18·3	65·2	10·4	·99	·42	R. A. Dunn, M.D., D.Hy., D.P.H.
18	Tendring	19·8	90·9	10·2	·76	·85	J. W. Cook, M.D.
	Rural Rates	20·2	65·0	10·0	1·2	·65	

*Corrected for age and sex distribution.



COUNTY DEATH RATES.

Black from the seven principal Zymotic Diseases.
Shaded from "All other Causes."

HARD *versus* SOFT WATER.

In the Annual Report for the year 1910 I gave a series of statistics shewing that

1. In the areas supplied with hard water the death-rate is quite as low as, if not actually lower, than in the areas supplied with a soft or moderately hard water, and that

2. Filtered river water, even when the river water impounded is known to be more or less sewage polluted, is as wholesome as the water from the deep wells and springs in this county.

These conclusions were based upon the statistics for one year. The report proved of such interest that more copies have been applied for than I could supply, and the applications were not limited to this country, the subject being one of equal importance in all parts of the world. When the Census returns for 1911 were received and the Registrar General had supplied me with factors for the correction of the death-rates on account of differences in age and sex distribution of the population in every district of the county, I decided to again consider the subject and to take a period of 5 years as the basis for comparison. The results now given, therefore, are much more reliable than those published in 1911, but they support entirely the conclusion at which I then arrived.

The areas taken are exactly the same as before, with the exception that in Group IV. I have included the Romford Rural District. The reason for this is that it is decidedly urban in character, and the great bulk of the population is supplied with the same water as that used in the Romford Urban District.

Besides giving the average death-rates for the five years, 1907-11 (inclusive), I have also given the death-rates for 1912, all corrected.

GROUP I.

Hardness of Water Supply under 10° per 100,000.

SOFT WATER AREA.

	Averages for years 1907-11.		Year 1912.	
	Population.	Death-rate.	Population.	Death-rate.
Burnham	3,150	8·9	3,200	11·5
Leigh-on-Sea	7,000	10·1	8,550	10·7
Maldon	6,100	11·0	6,335	11·5
Shoeburyness	4,800	10·3	5,075	8·7
Southend-on-Sea	56,200	11·2	67,280	9·7
Totals and Averages ..	77,350	11·0	90,440	10·0

GROUP II.

Hardness of Water Supply between 10° and 20°.

MODERATELY HARD WATER AREA.

	Averages for years 1907-11.		Year 1912.	
	Population.	Death-rate.	Population.	Death-rate.
Braintree	6.100	12·8	6,170	13·3
Brightlingsea	4,500	10·7	4,390	12·1
Colchester	41,990	12·1	44,160	10·7
Saffron Walden	6,230	9·7	6,350	7·6
Witham	3,470	10·3	3,480	14·0
Wivenhoe	2,400	7·9	2,500	10·4
Totals and Averages ..	64,690	11·5	67,050	10·9

GROUP III.

Hardness of Water Supply 20° to 30°.

HARD WATER AREA.

	Averages for years 1907-11.		Year 1912.	
	Population.	Death-rate.	Population.	Death-rate.
Clacton	9,300	12·0	9,850	9·2
Chelmsford	17,000	9·2	18,300	8·9
Epping	4,150	9·1	4,300	7·1
Frinton	1,400	8·0	1,570	8·5
Walton	2,150	9·9	2,190	9·9
Harwich	13,200	14·1	13,970	12·9
Halstead	6,200	12·0	6,300	9·0
Totals and Averages ..	53,400	11·2	56,480	9·9

GROUP IV.

SOUTH ESSEX AREA. MODERATELY HARD WATER.

	Averages for years 1907-11.		Year 1912.	
	Population.	Death-rate.	Population.	Death-rate.
Barking	30,770	13·0	32,520	10·6
Brentwood	6,500	8·8	6,940	6·2
Grays	15,810	11·0	16,420	10·7
Romford	16,550	10·2	17,600	9·5
,, Rural	23,860	10·5	26,000	9·3
Totals and Averages ..	93,490	11·2	99,480	9·9

GROUP V.

METROPOLITAN WATER BOARD AREA. HARD WATER.

	Averages for years 1907-11.		Year 1912.	
	Population.	Death-rate.	Population.	Death-rate.
Buckhurst Hill	4,800	10·2	4,900	9·1
Chingford	6,500	8·55	8,680	8·9
East Ham	126,600	12·1	138,450	11·1
Leyton	122,100	10·4	126,700	10·8
Loughton	5,300	9·7	5,500	10·8
Waltham Cross	6,650	11·35	6,830	10·0
Walthamstow	118,500	11·6	128,480	10·4
Wanstead	13,200	8·5	15,700	7·2
Woodford	17,650	9·3	19,070	9·4
Totals and Averages ..	421,300	11·1	454,310	10·6

Summarising the Tables we obtain the results as follows:—

	Death-rate 1907-11.			Death-rate 1912.		
	Average.	Extremes.		Average.	Extremes.	
		Maximum.	Minimum.		Maximum.	Minimum.
Soft Water Area	11·0	11·2	8·9	10·0	11·5	8·7
Moderately Hard Water Areas :—						
(*a*) Country Towns	11·5	12·8	7·9	10·9	14·0	7·6
(*b*) South Essex	11·2	13·0	8·8	9·9	10·6	6·2
Hard Water Area :—						
(*a*) Country Towns	11·2	14·1	8·0	9·9	12·9	7·1
(*b*) Metropolitan	11·1	12·1	8·5	10·6	11·1	7·2

Arranged in order of death-rates, we obtain the following interesting results :—

	Average for 1907-11.		Year 1912.
Soft Water Area	11·0	Hard Water Area (Country Towns)	9·9
Hard Water Area (Metropolitan) ..	11·1	Moderately ,, (South Essex) ..	9·9
,, (Country Towns)	11·2	Soft Water Area	10·0
Moderately hard water Area (South Essex)..	11·2	Hard Water Area (Metropolitan) ..	10·6
,, ,, (Country Towns)	11·5	Moderately ,, (Country Towns) ..	10·9

Naturally there are greater variations in the rates for single years than in the rates for a series of years, but it is obvious that there is no co-relation in either table between the hardness of the water and the death-rates.

Taking the average for the five years, the difference between the death-rates for the area with the softest waters and the area for the hardest waters is in one instance (the Metropolitan area) only 0·1 per 1,000, and in the other (Country towns) only ·2, whilst the moderately hard water areas taken together have a death-rate exceeding that of the hard water areas of from 0·1 to 0·3 per 1,000. These differences are so slight that only one conclusion can be deduced, namely, that the character of the water supplies in the county had no effect upon the death-rates.

Incidentally, they also confirm the opinion expressed in my previous report, that the filtered water from the sewage polluted rivers, the Thames and the Lee, is as wholesome as the water from our very deep wells and gravel springs. As comparatively little water is taken from springs we may say that the filtered river water is as wholesome as the water from our deep wells, which is celebrated for its great organic purity.

DEATH-RATES FROM CANCER, PHTHISIS, AND TYPHOID FEVER IN VARIOUS WATER AREAS.

GROUP I.

SOFT WATER AREA. RATE AVERAGE FOR LAST FIVE YEARS.

	Cancer.	Phthisis.	Typhoid Fever.	Typhoid Fever Case rate
Burnham	1·17	·51	·0	·14
Leigh-on-Sea	1·05	·82	·05	·40
Maldon	1·15	·62	·3	1·25
Shoeburyness	·62	·66	·05	1·05
Southend	1·0	1·16	·017	·2
Average for whole Area	1·0	·99	·043	·35

GROUP II.

MODERATELY HARD WATER AREA. COUNTRY TOWNS.

	Cancer.	Phthisis.	Typhoid Fever.	Typhoid Fever Case rate.
Braintree	·95	·78	·0	·0
Brightlingsea	·75	·58	·045	·27
Colchester	·80	·96	·015	·11
Saffron Walden	1·0	·55	·0	·04
Witham	1·35	·70	·110	·9
Wivenhoe	·51	·50	·08	·33
Average for whole Area	·84	·81	·021	·15

GROUP III.

HARD WATER AREAS. COUNTRY TOWNS.

	Cancer.	Phthisis.	Typhoid Fever.	Typhoid Fever Case rate.
Clacton	·7	1·03	·03	·22
Chelmsford	·77	·71	·055	·19
Epping	1·0	·91	·0	·05
Frinton	·72	·90	·0	·0
Walton	·82	·74	·0	·34
Harwich	·67	·56	·08	·65
Halstead	1·37	·88	·0	·07
Average for whole Areas	·81	·75	·04	·28

GROUP IV.

MODERATELY HARD WATER. SOUTH ESSEX AREA.

	Cancer.	Phthisis.	Typhoid Fever.	Typhoid Fever Case rate.
Barking	·8	1·21	·11	·61
Brentwood	·58	·18	·0	·13
Grays	·92	1·05	·0	·2
Romford	1·05	·79	·22	1·01
Romford Rural	·86	·71	·2	·03
Average for whole Area	·86	·90	·125	·40

GROUP V.

METROPOLITAN HARD WATER AREA.

	Cancer.	Phthisis.	Typhoid Fever.	Typhoid Fever Case rate.
Buckhurst Hill	1·17	·62	·08	·42
Chingford	·85	·71	·03	·03
East Ham	·8	·87	·05	·23
Leyton	·76	·87	·03	·18
Loughton	·72	·45	·00	·2
Waltham Cross	·95	·65	·00	·04
Walthamstow	·92	·88	·045	·23
Wanstead	·75	·44	·02	·1
Woodford	·8	·50	·06	·24
Average for whole Area	·83	·81	·041	·21

AREA SUPPLIED BY THE SOUTH ESSEX WATER COMPANY AND METROPOLITAN WATER BOARD.

	Cancer.	Phthisis.	Typhoid Fever.	Typhoid Fever Case rate.
Ilford	·82	·64	·02	·17

SUMMARY OF TABLES.

	Cancer Death-rates.		
	Average.	Extremes.	
		Maximum.	Minimum.
Soft Water Area	1·0	1·17	·62
Moderately Hard Water Area. Country Towns ..	·84	1·35	·51
,, ,, South Essex ..	·86	1·05	·58
Hard Water Area. Country Towns	·81	1·37	·67
,, Metropolitan Area	·83	1·17	·72
Mixed Waters. Ilford	·82	—	—

Taken as a whole there is a greater prevalence of Cancer in the soft water areas than in any other, but this is chiefly due to the number of deaths from this disease which occur in Southend, and the Medical Officer of Health has shewn that in one-fourth of the cases the patients knew that they were suffering from the disease

when they took up residence in the Borough. There is no evidence, therefore, of any connection between the hardness or softness of water and the prevalence of Cancer.

	Phthisis Death-rates.		
	Average.	Extremes.	
		Maximum.	Minimum.
Soft Water Area	·99	1·16	·51
Moderately Hard Water Area. Country Towns ..	·81	·96	·50
,, ,, South Essex ..	·90	1·21	·18
Hard Water Area. Country Towns	·75	1·03	·56
,, Metropolitan Area	·81	·88	·44
Dual Supply. Ilford	·64	—	—

Here again, the soft water area has the highest death-rate from Phthisis, but the reason is exactly the same as is given for the excessive mortality from Cancer. Patients in the early stage of the disease flock to health resorts in the hope of arresting its progress. All the variations admit of explanation without assuming that the hardness of the public water supply is a factor and with variations so great it is obvious that these other factors were of far greater importance. The figures lend no support to the view of the nature of the water having any influence, whatever, over the prevalence of the disease.

TYPHOID FEVER.

	Death-rate.	Extremes.		Case-rate.	Extremes.	
		Maximum.	Minimum.		Maximum.	Minimum.
Soft Water Area	·043	·3	·0	·35	1·25	·14
Moderately Hard Water. Country Towns	·021	·045	·0	·15	·33	·0
,, South Essex ..	·121	·22	·0	·40	1·01	·03
Hard Water. Country Towns	·04	·055	·0	·15	·9	·0
,, Metropolitan Area	·041	·08	·0	·21	·42	·03
Dual Supply. Ilford ..	·02	—	—	·17	—	—

The great variations here, are against the assumption that the hardness of the water bears any relation to the prevalence or mortality from this disease. For example, the highest mortality occurs in one moderately hard water area, and the lowest in another area in part supplied with the same water, and in part with a harder water, whilst the area with the softest water has practically the same death-rate as the area supplied with the hardest water.

I am not aware that it has ever been suspected by medical men that there was any connection between the calcareous constituents of waters and the prevalence of these diseases, but there is apparently a large number of laymen who suspect some such connection, as I receive many letters every year asking whether the water in certain districts is hard or soft, and whether the water would cause Cancer or Phthisis or be injurious to persons suffering from these diseases. I could not find any statistics which I could quote, hence while studying the effect of the calcareous constituents (which cause hardness) or the general death-rate, I determined also to compare the deaths from these special diseases in the various areas into which I had divided the County.

The statistics above quoted are, however, of considerable importance as showing that the soft waters of Essex which invariably contain considerable quantities of common salt and of carbonate and sulphate of soda are excellent for drinking purposes and well adapted for all the purposes of a public supply. This is a subject to which I have referred in previous reports, but the statistics then available were not so reliable as those used in calculating the death rates, &c., in the present report. It would be decidedly interesting to study the distribution of many other diseases in relation to the water supplies, but, at present, time does not permit, as a good deal of labour is involved in making all the corrections necessary for obtaining reliable results.

SECTION II.

PREVALENCE OF INFECTIOUS DISEASE.

The number of cases of disease notified under the Infectious Diseases Notification Act was about 33 per cent. below the average for the last 10 years, and considerably below the number notified in 1911. Diphtheria, Scarlet Fever, and Typhoid Fever were all below the average. Puerperal Fever alone exceeded the average.

Although Cerebro-spinal Meningitis (Spotted Fever) and Poliomyelitis (a paralytic disease of childhood) are notifiable under the Act by Order of the Local Government Board, they are not included in the "total" for 1912, as this would render the figures less comparable with those of previous years. The numbers of these cases, however, is so small that the rate per 1,000 population is not affected.

The figures given are the totals taken from the Annual Reports. They differ slightly from the totals obtained from the weekly returns published by the Local Government Board.

TABLE XV.

TOTAL NUMBER OF CASES OF INFECTIOUS DISEASES NOTIFIED DURING THE 10 YEARS 1903-1912.

Year.	Small-pox	Scarlet Fever.	Diphtheria and Membranous Croup.	Fevers—Typhoid and Continued.	Puerperal Fever.	Erysipelas.	Cerebro-spinal Meningitis.	Poliomyelitis.	Totals.	Rate per 1,000 population.
1903	96	2,528	1,659	589	42	750	...	...	5,664	6·4
1904	112	3,534	1,764	453	51	812	...	..	6,726	7·4
1905	3	4,563	1,453	398	45	863	...	...	7,325	7·8
1906	0	4,434	1,869	366	56	833	...	...	7,558	7·8
1907	0	5,138	1,918	243	41	758	...	...	8,098	8·0
1908	3	4,490	1,767	266	39	738	...	...	7,303	7·0
1909	0	3,645	1,371	161	42	688	...	...	5,907	5·5
1910	7	2,338	1,062	139	38	655	...	...	4,239	3·8
1911	10	2,964	1,369	327	50	754	..	...	5,474	5·1
1912	1	2,508	1,153	182	72	755	4	30	4,671	4·3
Average ...	23·5	3,614	1,538	312	48	761	...	...	6,270	6·3

SMALL POX.

The only case which occurred in the County was notified in Clacton-on-Sea. The patient was an unvaccinated visitor. The steps taken prevented any spread of the disease, but this one case cost the town £72.

Several reports refer to the increase of conscientious objectors to vaccination, and there is little doubt that in some areas half the population is either not vaccinated or inefficiently vaccinated. The returns given by the Medical Officer of Health for the Borough of Colchester are interesting. As he remarks, "Unvaccinated children are now beginning to fill the Infant Departments of the Schools, and if Small-pox occurs in a school child and remains unreported for a few days, as is quite possible, the outbreak that will follow will be most extensive and fatal."

VACCINATION RETURNS FOR THE BOROUGH OF COLCHESTER.

	Percentage of Children Vaccinated.	Percentage of Objections.
1906	72 ...	4
1907	72 ...	6
1908	65 ...	16
1909	62 ...	22
1910	53 ...	28
1911	38 ...	29
1912	43 ...	38

I am not nearly so alarmed as many Medical Officers of Health at this increase in the unvaccinated population but at the same time it causes me great anxiety every time a case of Small-pox is reported in the County, as any neglect to notify or any delay in dealing with a case may be fraught with serious consequences. I cannot help thinking that if conscientious or other objectors had seen the cases I have seen, and the effects produced in countries where the disease is prevalent, they would be quite willing that their children should take the risk (if any) of being injuriously affected by vaccination rather than they should suffer the slightest risk of contracting the loathsome disease, or of being maimed or disfigured by an attack. Apparently, however, nothing but a serious epidemic will have any effect, then the public vaccinators will reap a harvest.

SCARLET FEVER.

As previously stated, this disease was less prevalent than in the year 1911. Speaking generally, the type was very mild. The cases which occurred in the Romford area were unusually severe, 6 deaths occurring out of 99 notified cases, whereas the average for the whole County was only a little over 1 %. In proportion to the number of cases, it probably causes fewer deaths than Measles, and fewer ill effects afterwards, yet if a few cases occur in any parish, it is astounding what alarm it produces. In some instances the better educated classes are almost panic stricken and appeal to the Medical Officer of Health and the Sanitary Authority to do all sorts of illegal things, yet when Measles is prevalent no one appears to take any notice, and

TABLE XVI.

Scarlet Fever.

DISTRICTS.	No. of cases notified.	No. of deaths.	No. of cases removed to hospital.	Cases per 1,000 population.	Deaths per 100 cases.	Percentage of cases removed to hospital.
Urban Districts.						
Barking ...	95	0	89	2·9	0	93·87
Braintree	1	0	0	·16	0	0
Brentwood	6	0	6	·86	0	100·0
Brightlingsea	1	0	0	·23	0	0
Buckhurst Hill	1	0	0	·20	0	0
Burnham	9	0	6	2·8	0	66·6
Chelmsford	71	1	65	3·9	1·4	91·5
Chingford	18	0	5	2·0	0	27·7
Clacton ...	29	0	27	2·9	0	93·1
Colchester	28	0	24	·63	0	85·7
East Ham	435	7	334	3·1	1·6	76·8
Epping ...	22	1	22	5·2	4·5	100·0
Frinton-on-Sea	1	0	0	·63	0	0
Grays	74	0	47	4·5	0	63·5
Halstead	1	0	1	·16	0	100·0
Harwich ...	4	0	4	·29	0	100·0
Ilford ...	286	1	217	3·5	·35	75·9
Leigh-on-Sea	10	0	0	1·2	0	0
Leyton ...	330	4	230	2·6	1·2	69·6
Loughton	2	0	2	·36	0	100·0
Maldon ..	2	0	2	·31	0	100·0
Romford ...	57	3	49	3·3	5·2	·86
Saffron Walden	24	0	22	3·7	0	91·6
Shoeburyness	18	0	12	3·5	0	66·6
Southend-on-Sea ...	140	2	124	2·08	1·4	88·6
Tilbury ...	10	0	8	.14	0	80·0
Waltham Holy Cross	36	0	35	5·3	0	97·2
Walthamstow ...	287	2	226	2·2	·69	80·0
Walton-on-the-Naze	0	0	0	·0	0	0
Wanstead	34	0	18	2·1	0	53·0
Witham	3	0	0	·08	0	0
Wivenhoe	0	0	0	·0	0	0
Woodford	36	0	22	1·8	0	61·1
Total ...	2071	21	1597	2·5	1·01	77·1
Rural Districts.						
Belchamp	5	0	0	1·1	0	0
Billericay	31	0	31	1·8	0	100·0
Braintree	38	0	29	2·1	0	76·3
Bumpstead	2	0	0	·7	0	0
Chelmsford	41	0	33	1·7	0	80·5
Dunmow	35	0	18	2·1	0	51·4
Epping	38	3	18	2·7	7.9	47·3
Halstead, No. 1	8	0	0	1·3	0	·0
Halstead, No. 2	0	0	0	·0	0	·0
Lexden and Winstree	34	0	12	1·7	0	35·3
Maldon	21	0	6	1·3	0	28·6
Ongar ...	7	1	6	·65	14·2	85·6
Orsett ..	46	0	16	2·5	·0	34·8
Rochford	29	0	21	1·5	·0	72·4
Romford	42	3	34	1·6	7·1	81·0
Saffron Walden	42	0	33	3·9	0	78·6
Stansted	0	0	0	·0	0	·0
Tendring	18	0	9	·81	·0	50·0
Total ...	437	7	266	1·6	1·6	60·8

a considerable number of cases may occur before the Medical Officer of Health hears anything about it.

The only districts in which no single case occurred were Walton, Wivenhoe and Stansted (R.), and in five districts only one case was notified in each. There was no outbreak of any magnitude in any district, but in the following areas there was excessive prevalence :—

Urban.	Cases per 1000 population.	Rural.	Cases per 1,000 population.
Chelmsford	3·9	Epping	2·7
East Ham	3·1	Orsett	2·5
Epping	5·2	Saffron Walden ...	3·9
Grays	4·5		
Ilford	3·5		
Romford	3·3		
Saffron Walden ...	3·7		
Waltham Cross ...	5·3		

East Ham. The Medical Officer of Health thinks the cinematograph theatres are responsible for the spread of infection.

Grays. The exceedingly mild type of the disease caused great difficulty in eradicating it.

Ilford. A troublesome outbreak occurred at Goodmayes Junior Mixed School, the cases mostly occurring in one classroom.

Epping (R.) Twenty-one cases occurred in a " Home " at Chigwell.

DIPHTHERIA.

The disease was more prevalent in the Urban than in the Rural Districts and the mortality rate was higher in the former, 9·3 per cent. against 6·9 per cent. The type of disease is either now much milder than in former years or the treatment now afforded, chiefly anti-toxin, is far more efficient.

No cases occurred in any of the following districts :—Brightlingsea, Buckhurst Hill, Burnham, Frinton, Loughton, Maldon, Walton and Belchamp. The last named was the only Rural district which entirely escaped. In many districts, however, only 1, 2 or 3 cases were notified.

There was no extensive outbreak but an excessive number of cases occurred in Chingford, Ilford, Saffron Walden, Walthamstow and Witham, and in Bumpstead, Rochford and Saffron Walden Rural.

Chingford. The disease prevailed during the whole year and was mainly spread by contact at schools.

Ilford. The disease was prevalent throughout the year. The Medical Officer of Health says : " The question of testing bacteriologically the condition of the nose

and throat of patients recovering from the disease, before declaring them free to mix with others, seems to me to merit more consideration from the medical practitioner."

WALTHAMSTOW. Although the Council provides Anti-toxin the Medical Officer of Health says that only a small percentage of the cases were injected prior to their removal to the hospital. In September and October the disease was of an unusually severe type. In some cases a medical man was not called in until the patient was moribund.

WOODFORD. The type of disease which prevailed here was unusually severe. Out of 15 cases three were fatal.

BUMPSTEAD. Most of the cases occurred amongst the scholars at Birdbrook School.

ROCHFORD. Most of the cases occurred within a small area round Sutton. The infection was probably from undetected cases at School.

SAFFRON WALDEN (R.) The Medical Officer of Health gives details of a most interesting little outbreak due to a girl who had had diphtheria in London, and who, when she returned to her home, had a suppurative sore on the scalp. This proved, upon bacteriolgical examination, to be diphtheritic in character. She had infected several persons with whom she had been in contact before the nature of the scalp affection was discovered, and when taken into the Saffron Walden Hospital she infected the Matron and two of the nurses.

The mortality rate for both Diphtheria and Scarlet Fever, diseases much more nearly allied than is usually suspected, appeared to reach a minimum in 1911. It is quite possible that we are entering upon a cycle of increased severity. The fluctuations are well shewn in the following Table :—

DEATHS PER 100 CASES NOTIFIED.

	Diphtheria.	Scarlet Fever.
1895-1900	16·4	1·55
1901	11·4	1·4
1902	10·6	1·5
1903	8·9	2·2
1904	9·2	1·8
1905	9·7	1·8
1906	12·9	2·2
1907	10·6	2·1
1908	11·6	1·8
1909	8·9	1·6
1910	8·3	1·6
1911	7·6	·95
1912	8·8	1·1

TABLE XVII.

Diphtheria and Membranous Croup.

DISTRICTS.	No. of cases notified.	No of deaths	No. of cases removed to hospital.	Cases per 1,000 population.	Deaths per 100 cases.	Percentage of cases removed to hospital.
Urban Districts.						
Barking	35	2	24	1·1	5·7	68·5
Braintree	3	0	0	·48	0	0
Brentwood	3	0	2	·43	0	66·6
Brightlingsea	0	0	0	0	0	0
Buckhurst Hill	0	0	0	0	0	0
Burnham	0	0	0	0	0	0
Chelmsford	25	1	23	1·3	4	92
Chingford	29	3	19	3·3	10·4	65·5
Clacton	6	0	6	·61	0	100
Colchester	31	3	28	·70	9·7	90
East Ham	72	9	82	·51	12·5	72
Epping	3	0	3	·71	0	100
Frinton-on-Sea	0	0	0	0	0	0
Grays	22	3	11	·18	13·6	50
Halstead	1	0	1	·14	0	100
Harwich	8	2	8	·57	25	100
Ilford	139	5	98	1·7	3·6	70
Leigh-on-Sea	2	0	0	·23	0	0
Leyton	155	22	102	1·2	14·2	65·8
Loughton	0	0	0	0	0	0
Maldon	0	0	0	0	0	0
Romford	19	1	11	1·1	5·2	58
Saffron Walden	16	1	12	2·5	6·2	75
Shoeburyness	8	0	3	1·5	0	37·5
Southend-on-Sea	61	6	54	·9	9·8	88·5
Tilbury	4	0	4	.57	0	100
Waltham Holy Cross	3	0	3	·44	0	100
Walthamstow	233	23	199	1·8	9·9	85·4
Walton-on-the-Naze	0	0	0	0	0	0
Wanstead	23	1	14	1·4	4·3	61
Witham	6	0	0	1·7	0	0
Wivenhoe	1	0	1	·4	0	100
Woodford	15	4	10	·78	26·6	66·6
Total	923	86	688	1·1	9·3	74·5
Rural Districts.						
Belchamp	0	0	0	0	0	0
Billericay	28	0	27	1·3	0	96·4
Braintree	16	1	15	·87	6·2	93·8
Bumpstead	14	0	0	5·4	0	0
Chelmsford	23	3	17	·99	13	74
Dunmow	11	0	6	·68	0	54·5
Epping	18	3	16	1·2	16·6	88·8
Halstead, No. 1	2	0	1	·42	0	50
Halstead, No. 2	1	0	0	·18	0	0
Lexden and Winstree	3	0	2	·15	0	66·6
Maldon	12	1	8	·73	8·3	66·6
Ongar	2	0	0	·19	0	0
Orsett	10	1	7	·54	10	70
Rochford	28	2	10	1·5	7·2	35·7
Romford	24	1	14	·92	4·2	58·3
Saffron Walden	25	3	18	2·3	12	72
Stansted	3	0	3	·42	0	100
Tendring	10	1	5	·45	10	50
Total	230	16	149	·88	6·9	64·8

TYPHOID FEVER.

Far fewer cases of this disease occurred in 1912 than in the previous year, and more than twice as many occurred, in proportion to the population, in the Rural districts than in the Urban. This is unusual. Not a single case occurred in eight Urban districts and six Rural districts. Above twice the average number occurred in the following areas:—

Urban.	Rural.
Barking	Dunmow
Brightlingsea	Orsett
Buckhurst Hill	Rochford
Clacton	
Harwich	
Leigh	
Maldon	
Shoeburyness	
Witham	
Wivenhoe	

The mortality at Buckhurst Hill and Witham was 50 per cent., but this was probably accidental as only four cases occurred in the two districts. In other areas the mortality was as high as 33 per cent. It is noteworthy that there was excessive prevalence in the following areas bounded by the sea or tidal rivers: Brightlingsea, Clacton, Harwich, Leigh, Maldon, Shoeburyness, Wivenhoe and Rochford Rural. The probability of the infection being due to shell-fish is certainly suggested. Comparatively few cases occurred at Southend and the excessive prevalence which used to occur in the Thames Valley no longer persists.

Brightlingsea. Two of the three persons attacked had not eaten oysters and the third had only partaken of them after being fried.

Harwich. The cases which occurred here were traced to a dairy farm outside the borough. A man engaged in milking the cows was proved to be a "carrier." "An examination of his blood shewed that although he was in good health at the time he was a carrier of infection, and there was no reasonable doubt that he infected the milk with the typhoid bacillus from handling the cows' teats."

Witham. One of the cases here was probably due to eating oysters.

Orsett (R.) Thirteen cases occurred in West Thurrock and Purfleet in July and August. The ages and distribution of the patients pointed very strongly to some food stuff as being the cause. Ice cream was strongly suspected, but apparently would only explain eight of the thirteen cases. No "carrier" could be found.

Rochford (R.) One case was apparently due to shell-fish, and three possibly to a polluted well.

In other areas given as having had unusual prevalence the Medical Officers of Health either make no reference to the disease or do not refer to any suspected cause.

Save the three cases at Rochford none are attributed to polluted water supplies.

TABLE XVIII.

Typhoid, Continued, and Puerperal Fevers.

DISTRICTS.	Typhoid and Continued Fevers.						Puerperal Fever.	
	No. of cases notified.	No. of deaths.	No. of cases removed to hospital.	Cases per 1,000 population.	Deaths per 100 cases.	Percentage of cases removed to hospital.	No. of cases notified.	No. of deaths.
Urban Districts.								
Barking	10	1	9	·30	10	90·	2	3*
Braintree	0	0	0	0	0	0	0	0
Brentwood	0	0	0	0	0	0	1	0
Brightlingsea	3	1	0	·68	33·3	0	0	0
Buckhurst Hill	2	1	2	·40	50	100·	0	0
Burnham	0	0	0	0	0	0	0	0
Chelmsford	2	0	0	·11	0	0	0	0
Chingford	1	1	0	·11	100	0	0	0
Clacton	5	0	3	·51	0	60·	0	0
Colchester	1	1	0	·02	0	0	0	1†
East Ham	13	3	9	·09	23·0	69·2	8	3
Epping...	0	0	0	0	0	0	0	0
Frinton-on-Sea	0	0	0	0	0	0	0	0
Grays ...	3	0	3	·18	0	100·	1	0
Halstead	0	0	0	0	0	0	2	2
Harwich	9	1	9	·64	11·1	100·	0	0
Ilford ...	4	0	1	·05	0	25·	6	3
Leigh-on-Sea	3	0	0	·35	0	0	0	0
Leyton	21	4	10	·16	19	48·	16	5
Loughton	1	0	1	·18	0	100·	0	0
Maldon	3	1	2	·47	33·3	66·6	2	0
Romford	3	1	1	·17	33·3	33·3	2	1
Saffron Walden	0	0	0	0	0	0	1	0
Shoeburyness	4	0	2	·71	0	50·	0	0
Southend-on-Sea	11	1	9	·16	9·1	81·8	7	1
Tilbury	1	0	1	·14	0	100·	0	0
Waltham Holy Cross	0	0	0	0	0	0	0	0
Walthamstow	14	2	9	·11	14·3	64·3	10	4
Walton-on-the-Naze	0	0	0	0	0	0	0	0
Wanstead	1	0	0	·06	0	0	1	1
Witham	2	1	0	·57	50	0	0	0
Wivenhoe	4	1	0	1·6	25	0	0	0
Woodford	1	0	1	·05	0	100	0	0
Total	120	20	72	·14	16·6	60	59	24
Rural Districts.								
Belchamp	0	0	0	0	0	0	0	0
Billericay	8	0	4	·37	0	50·	1	0
Braintree	4	0	4	·22	0	100·	0	0
Bumpstead	0	0	0	0	0	0	0	0
Chelmsford	2	0	0	·09	0	0	0	0
Dunmow	9	2	8	·55	22·2	88·8	3	2
Epping...	1	0	0	·07	0	0	0	0
Halstead, No. 1	2	0	0	·42	0	0	0	0
Halstead, No. 2	0	0	0	0	0	0	1	0
Lexden & Winstree	4	0	1	·20	0	25·	2	0
Maldon	0	0	0	0	0	0	0	0
Ongar ..	0	0	0	0	0	0	1	1
Orsett ...	14	1	13	·76	7·1	93·	0	0
Rochford	8	2	1	·43	25	12·5	0	0
Romford	1	0	0	·04	0	0	4	1
Saffron Walden	0	0	0	0	0	0	1	0
Stansted	1	0	0	·14	0	0	0	0
Tendring	6	1	6	·27	16·6	100·	0	0
Total	60	6	37	·23	10	61·6	13	4

* 3 deaths occurred although only 2 cases were notified.

† 1 death ,, ,, no case was notified.

PUERPERAL FEVER.

An unusual number of cases of this disease occurred during the year, 72 having been notified with 28 deaths. In about half the number of districts no case occurred. About one-third of the whole number occurred in Walthamstow and Leyton.

Leyton. Of the 16 cases which were notified here nine were attended by midwives, and four by the same midwife. *Vide* Midwives Report. The Medical Officer of Health thinks that only a proportion of the cases of this disease are notified.

Walthamstow. Dr. Clarke refers to a woman who was prematurely confined and who was visited at different times by three nurses. Two doctors saw her subsequently, but he did not receive the notification until the 9th day. Meanwhile two other women became infected. "Once the facts became known, and the usual preventive measures taken, no further trouble was experienced." Considering the unfavourable conditions which obtain in the homes of the very poor Dr. Clarke is surprised that the mothers, as a rule, do so well. He suggests that a qualified medical man should visit every case attended by a midwife on the first and fourth day after confinement.

In 1911 one-seventh of the cases of Puerperal Fever occurred amongst persons attended by midwives, whilst one-third of the births registered were attended by midwives. During 1912 nearly half the cases of this disease occurred in the practice of midwives, but this excess was almost entirely due to two outbreaks for which the midwives could not be held responsible.

The subject will be again referred to under the Section dealing with the Administration of the Midwives Act.

No. of Deaths Recorded from Puerperal Fever.

	Urban Districts.	Rural Districts.	Administrative County.
1900	19	3	22
1901	19	4	23
1902	10	6	16
1903	19	2	21
1904	12	4	16
1905	11	6	17
1906	16	5	21
1907	24	5	29
1908	20	8	28
1909	16	1	17
1910	14	3	17
1911	20	4	24
1912	24	4	28

CEREBRO-SPINAL FEVER AND ACUTE POLIOMYELITIS.

Four cases were notified of Cerebro-spinal Fever, two in East Ham, one in Shoeburyness, and one in Southend. Thirty cases of Poliomyelitis were notified, 21 in the Urban districts and 9 in the Rural. Compulsory notification only came in force on September 1st, 1912, so that many other cases may have occurred yet not have come to the knowledge of the Medical Officer of Health.

Barking. The Medical Officer of Health says three cases of Poliomyelitis (Tooth-stroke) were notified but there was no connection between the cases and no indication of the source of the infection.

Colchester. Two cases of Poliomyelitis occurred here. Nc history of infection.

East Ham. Two cases of each disease notified. Both the cerebro-spinal cases proved fatal. No history of infection.

Halstead. Four cases of Poliomyelitis notified. Three were of children in Trinity Road and one in Westbourne Terrace. One was mild and speedily recovered, the other three remain paralysed. No history of infection recorded.

Harwich. One case of Poliomyelitis. No special reference.

Ilford. The case notified here should have been excluded as upon investigation the notification was found to be incorrect.

Leyton. Two cases of Poliomyelitis. No connection with each other. No spread of infection.

Romford. One case. No reference.

Shoeburyness. One case. No reference.

Southend. Both diseases were made notifiable early in the year, but only one case of each were notified. Details of these and of some allied cases are given. No history of infection.

Walthamstow. Four cases of Poliomyelitis were notified but no special reference is made to them.

Billericay, Romford, Saffron Walden (R.) One case in each. No special reference.

Tendring. Two fatal cases of Poliomyelitis recorded. No source of infection traceable.

Maldon (R.) Four cases occurred of which two were fatal. Both the latter occurred in one cottage. Early in August a case was notified from Latchingdon and upon visiting it was found that there was the body of a child in the house, and that this child had undoubtedly died of this disease. The second child died a day or two after notification and a *post-mortem* examination was made. The examination of the spinal cord conclusively proved the cause of death. The source of infection was

definitely traced to a case in a London Hospital. The children had been staying in London and had played with a child who, upon enquiry, was found to have been removed to a hospital and there found to he suffering from Poliomyelitis. Two other cases occurred in parishes wide apart, in which no history of infection could be traced.

With the exception of the two cases in the Maldon Rural District, a second case did not occur in any infected house, although in some of these houses there were many other children. Also, with the exception of the same two cases, no single case was found to be traceable to any pre-existing case.

MEASLES, WHOOPING COUGH, SCHOOL CLOSURE.

Measles was more prevalent in the Maldon Rural District than in any other. The spread of infection from parish to parish is described by Dr. Sinclair in his Annual School Report. Whooping Cough only occurred in a few fairly isolated localities.

Dr. Sinclair reports that, "excluding the cases where school closure was only adopted in order that premises might be disinfected, the total number of schools closed on account of the prevalence of infectious diseases was 73. Of these 53 were closed on the certificate of the School Medical Officer and 17 by order of the local sanitary authority."

PULMONARY TUBERCULOSIS.

A Table shewing the number of deaths from this disease which had occurred in each sanitary district has already been given and Table XIX. shews the number of persons notified as suffering from Consumption in 1912. Too much reliance must not be placed upon the latter table as it is quite certain that a considerable number of persons are suffering from Consumption, and in a fairly advanced stage, yet have not been notified. This is especially the case in Rural Districts, where persons suffer from coughs, which they attribute to colds, and do not call in a medical man until their working capacity is seriously impaired, and when, alas, it is too late for any treatment to be of avail.

For each person who dies during any given year from Pulmonary Tuberculosis there must be three to four other persons who are suffering from the disease, some in the very early and barely recognisable stage, others in well marked more or less advanced stages. Assuming 3·5 cases for each death the estimated number of cases which should have been notified during the year can be compared with the number of actual notifications.

	No. of deaths.	Estimated No. of cases.	No. of cases notified.
Urban Districts ...	638 ...	2,233 ...	2,024
Rural Districts ...	171 ...	598 ...	389
Administrative County ...	809 ...	2,831 ...	2,413

Apparently therefore practically all cases have been notified in the Urban Districts and only about two-thirds in the Rural Districts.

When the separate districts are examined it is found that a much smaller proportion is notified in certain areas. Maldon Rural District may be quoted as an example. Thirteen deaths occurred from Phthisis during the year, yet only 15 cases were notified. It follows that in this district alone there must be about 27 cases which have escaped notification:—twenty-seven persons suffering from Tuberculosis of the lungs who have either not called in a medical men, or whose condition has not actually been discovered.

In Halstead II. no notifications are recorded yet 4 deaths occurred.

In the Billericay, Chelmsford, and Rochford Rural Districts a satisfactory proportion of the total cases has been recorded, but in all the other rural areas many cases have yet to be notified. In certain of the Urban Districts also the proportion notified is too low, as in Braintree, Brightlingsea, Grays, Harwich, Leigh, Loughton, Maldon, Saffron Walden, Tilbury, Waltham Cross, Wanstead, Witham, and Wivenhoe.

For the above reason it is obvious that Table XIX. is useless for the purpose of studying the actual incidence of the disease, but is useful as shewing the urgent necessity for discovering these missed cases. So long as they are unknown they are a source of danger to the community and doubtless all these missed cases are getting steadily worse and their chance of cure or of marked improvement is becoming more remote.

The returns for the various districts shew the number of notifications has varied from ·7 per 1,000 population to 4·5, but as many of the figures are unreliable we can only take for comparative purposes those districts which have a large population, and in which the notifications largely exceeded the number of deaths. Even amongst these it is obvious that the notifications are deficient in Colchester and Walthamstow, as in both towns the deaths exceeded one-third of the notifications.

	Cases notified per 1,000 population.
Barking	3·3
Colchester	1·9
East Ham	2·7
Ilford	2·2
Leyton...	2·9
Southend	3·9
Walthamstow	2·3

It may be taken for granted that in every district the notified cases are visited and some kind of instruction given, and that disinfection occurs after death or removal. In some districts sputum flasks, etc. are provided. Anything beyond this the authorities are now looking to the County Council to undertake. In the County Council scheme the whole County is divided into six areas, each under the charge of a Tuberculosis Officer. Ten Dispensaries have been established in the populous areas, and consulting rooms engaged in the more rural centres. The duties of the Tuberculosis Officers is set out in the attached Schedule.

TABLE XIX.

Pulmonary Tuberculosis.

Names of Localities.	No. of cases notified.	No. of Deaths.	No. notified per 1,000 population.
Urban Districts.			
Barking	104	28	3·3
Braintree	13	8	2·1
Brentwood	9	2	1·2
Brightlingsea	3	2	0·68
Buckhurst Hill	11	4	2·25
Burnham	3	0	0·94
Chelmsford	44	10	2·4
Chingford	16	3	1·9
Clacton	25	8	2·55
Colchester	85	39	1·9
East Ham	365	103	2·7
Epping	11	2	2·58
Frinton	3	0	1·9
Grays	17	10	1·06
Halstead	28	7	4·46
Harwich	11	6	0·8
Ilford	173	43	2·2
Leigh-on-Sea	9	7	1·16
Leyton	370	115	2·9
Loughton	10	5	1·8
Maldon	15	7	2·4
Romford	47	13	2·8
Saffron Walden	5	3	0·79
Shoeburyness	16	3	3·19
Southend-on-Sea	248	66	3·9
Tilbury	2 ?	2 ?	0·31 ?†
Waltham Holy Cross	16	7	2·3
Walthamstow	295	107	2·3
Walton-on-the-Naze	6	3	2·7
Wanstead	14	7	1·01
Witham	6	3	1·7
Wivenhoe	11	5	4·6
Woodford	33	10	1·78
Total and Mean	2024	638	2·13
Rural Districts.			
Belchamp	7	5	1·5
Billericay	37	9	1·7
Braintree	21	16	1·13
Bumpstead	3	2	1·15
Chelmsford	39	9	1·7
Dunmow	40	16	2·48
Epping	19	7	1·3
Halstead No. 1	6	1	1·27
Halstead No. 2	—	4	—
Lexden & Winstree	42	20	2·13
Maldon	15	13	0·92
Ongar	12	6	1·12
Orsett	25	8	1·35
Rochford	33	8	1·7
Romford	44	18	1·7
Saffron Walden	6	7	0·55
Stansted	5	3	0·7
Tendring	35	19	1·6
Total and Mean	389	171	1·33

† Returns for portion of year only.

Sanatoria and hospital beds have been acquired as under :—

1.	Black Notley, near Braintree	...	16 beds.	12 in pavilion provided by the C.C.
2.	Colchester ...	...	8 „	In wards at the Isolation Hospital
3.	East Ham ...	...	24 „	„ „ „
4.	Ilford ...	...	6 „	„ „ „
5.	Chingford ...	...	8 „	„ „ „
6.	Ipswich Sanatorium	...	5 „	In Borough Sanatorium.
7.	Malting's Farm	...	20 „	„ Dr. Walker's Sanatorium, Nayland
8.	Merivale Sanatorium	...	6 „	„ Dr. Marrett's Sanatorium, Sandon.
9.	Victoria Park Hospital		10 „	„ London, E.
10.	Maldon Joint Hospital	...	8 „	„ shelters provided by C.C.
11.	Orsett „ „	...	6 „	„ „ „
12.	Romford „ „	...	8 „	„ pavilion provided by C.C.
	Total ...	...	125	

Of these the Insurance Committee has taken 115, leaving only 10 available for uninsured persons.

The present position of affairs may be gathered from the following report of the Public Health Committee, which was adopted by the County Council at the meeting held on July 1st :—

"COUNTY SCHEME FOR THE CONTROL OF TUBERCULOSIS.

Report of Committee.

"Dr. Thresh has reported to the Committee that since the Conference of the Insurance Committee and County Council Public Health Committee with the Insurance Commissioners, he has had the opportunity of discussing a County scheme with officials of the Local Government Board, and has reason to believe that the following scheme would be approved by all the Departments interested.

"The scheme is based upon the experience gained during the past nine months. This is proving invaluable, as we now have reliable information and statistics to guide us in our future development.

"The Insurance Committee has only a certain sum at its disposal for the treatment of persons suffering from tuberculosis, and the sum will not admit of the Insurance Committee treating the dependents of insured persons. It will only suffice for insured persons to the extent laid down in this scheme. These dependents and uninsured persons must therefore either be left undealt with or be dealt with by the County Council.

"The County Council has already made itself responsible for the maintenance of a certain number of dispensaries and of a certain number of Hospital and Sanatorium beds, under the impression that the Insurance Committee would continue to pay for dependents. As the funds of the Committee will not permit of such payment continuing, the maintenance of these beds and dispensaries will entail a cost of, probably, £6,000 a year, which will have to be borne by the County, and unless the County Council decides on a complete scheme for uninsured as well as insured persons the Local Government Board and the Treasury will make no grants in aid either of providing Institutions or towards the cost of maintaining them. On the other hand, if a complete scheme is agreed to the grants which will be received will be so considerable that such a scheme will really cost the County only a little more than the amount they are already committed to. The Council has, therefore, to decide whether to go on with an incomplete scheme which, on account of its deficiencies, will be of comparatively little use, and yet be almost as expensive as a complete scheme, or to go on with and complete a scheme which will deal with both insured and uninsured persons.

"This scheme includes the provision of tuberculosis officers and nurses, and of Dispensaries, Hospitals, and Sanatoria and shelters.

"The Insurance Committee will agree to pay a proportion of the cost of the maintenance of the dispensaries, to take a definite number of Hospital and Sanatorium beds, and to pay a rental for the use of shelters.

"Dispensaries. Experience has shewn that these can only be utilised in populous centres. In rural and small urban communities the expense would be altogether out of proportion to the advantage accruing. Moreover, a Tuberculosis Officer with a motor may be considered as a travelling dispensary, and he can visit patients, in consultation with their medical attendants, at their homes or at the doctor's surgery, and do all that is necessary without having fixed dispensaries. Your Committee therefore suggest that the six tuberculosis officers now appointed, with the aid of one assistant for taking duties during holidays, assisting in emergencies, &c., undertake all dispensary work in the County, and that the dispensaries be limited to the districts in which they have already been established.

"The total annual cost of running these dispensaries will be about £7,000 a year, and a proportion of this will be borne by the Insurance Committee. During last month your Committee find that the proportions of cases of different groups treated in our eleven dispensaries were as under:—

Insured persons	159	=	41 per cent.
Dependents	183	=	48 ,,
Uninsured	43	=	11 ,,
Totals	385		100

"On this basis the Insurance Committee should pay 41 per cent. of the cost of maintenance of the dispensaries, but it is only fair to point out that in the future,

when the value and utility of the dispensaries is more fully realised, the proportion of insured persons treated will not be so high as 41 per cent. Possibly 33 per cent. would be a safe basis for use in agreeing upon terms with the Insurance Committee. Insured persons would receive treatment at the dispensaries by order of the Insurance Committee, uninsured persons would be sent by medical practitioners and local sanitary authorities.

"Hospital and Sanatorium Beds. The Astor Commission expressed the opinion that one bed would be required for each 2,500 of the population. This, your Committee believe, is an over estimate. The number of persons who have applied for Sanatorium benefit since July last is, in round numbers, 800, and of these 280 required treatment in Hospitals or Sanatoria. For the whole year, when completed, the numbers applying will not exceed 1,000 and 350 will have required such institutional treatment. Each case is sent for an average period of three months, therefore 90 beds would serve for this number. If, therefore, the Council decide to provide such treatment for uninsured persons it is very unlikely that the number of applicants will exceed 2,000, for many of those dealt with last year were dependents and a few uninsured, and assuming that a larger proportion of cases require to go to Hospitals or Sanatoria 200 beds should suffice. During the past year, however, children have not been dealt with so completely as could be desired, and your Committee therefore suggest that besides these 200 beds for adults and persons over 13 years of age, 20 other beds should be provided for tuberculous children, making 220 beds in all.

"[More may require to be done for children suffering from tuberculosis of the bones, &c., and for children who are merely suspected to be tuberculous. These, so far as they cannot be dealt with by the County Council, might be dealt with by the King Edward Memorial Committee.]

"The cost of providing these Hospital and Sanatoria beds should not exceed £20,000, in fact, your Committee are assured that it can be done for less, and the annual cost of maintaining the 220 beds should not exceed £17,600, and the Insurance Committee should definitely take and pay for a certain number of beds at £80 a year each. Your Committee believe that 120 beds would satisfy their requirements. This would mean that the Insurance Committee would pay £9,600 and the County £8,000 per annum.

"Shelters. These should be provided for suitable cases, and if the County purchase the shelters and bear the cost of erection your Committee think the Sanitary Authority in whose district any shelter is erected should pay a rental of 1s. per week for its use and also be responsible for maintaining it in a habitable condition. The time of the Tuberculosis Officer is too valuable to be taken up in looking after the shelters, and the Sanitary Inspector could do this with little or no trouble.

"The cost of a shelter is £15, and, assuming that forty are provided, the cost to the county would be £600, and the rent received should pay expenses of removal and form a reserve fund for renewals.

"Appended will be found a more detailed estimate of original cost and annual cost upon which the foregoing figures are based, but the following briefly sums up the financial aspects of the scheme:—

"*Structural Expenses*—

	£	£
Cost of providing 120 Sanatorium beds and 100 beds at existing hospitals	20,000	
Local Government Board would grant three-fifths ...	12,000	
Balance to be found by the county		8,000
Cost of providing 12 dispensaries...	1,200	
Local Government Board grant of four-fifths ...	960	
Balance to be found by the county		240
40 shelters		600
Office furnishing, etc....		200
Total sum to be paid by the county		9,040

"*Annual Expenditure*—

Repayment of cost of Sanatoria and Dispensaries, £8,240, with interest at 4 per cent extended over 20 years will average		660
Cost of 12 dispensaries per annum	7,000	
Insurance Committee's payment, 33 per cent. ...	2,333	
Balance	4,667	4,667
Maintenance of 100 Hospital and Sanatorium beds ...		8,000
Extra office expenses, say		200
		£13,527

"The annual expense would therefore be £13,527, but the Hobhouse grant to an approved scheme will be one half, therefore the total expense to the county would be £6,764.

"As a scheme of this kind is practically complete, it cannot fail to have a very marked effect in controlling the prevalency of tubercular diseases, it would save many lives, save an enormous amount of suffering, prevent a large number of families from becoming a burden on the poor-rate, and otherwise be of such great value to every sanitary district in the County that the Committee strongly urge the Council to adopt it.

"It should not be forgotten that each Dispensary would become a centre for the dissemination of useful knowledge concerning tuberculosis, and that our Tuberculosis

Officers and Nurses working with the local Medical Officers of Health would be of indirect benefit to every Sanitary Authority. The whole of the work relating to the control of tuberculosis throughout the County would be co-ordinated, and the administration would be more efficient and more economical than could possibly be the case if each Authority exercised control in its own district. Moreover each Authority is given an interest in the administration by nominating its own patients for treatment at the Dispensaries and for treatment in Sanatoria and Hospital.

"It should not be forgotten also that early cases of tuberculosis require change of air, constant medical supervision, regulated exercises, &c., which they could only obtain in a large central institution, and which could not possibly be obtained in small local hospitals.

"The formation of "Care" and "After-Care" Committees should also be effected locally, and any slight expense incurred thereby might fairly be borne by the localities which they served.

"Nothing has been said about the equipment or provision of a Laboratory, because at present the work can be done in the County Public Health Laboratory at a trifling cost.

"BASIS UPON WHICH ESTIMATES GIVEN IN THE COUNTY SCHEME ARE FOUNDED.

"COST OF HOSPITAL BEDS.—Pavilions and shelters have already been erected by the County Council at several hospitals in the county, and the average cost per bed for structures and furnishing is £40.

"COST OF SANATORIUM BEDS.—The L.G.B. has issued model plans, and your Committee are informed that, with due regard to economy, a sanatorium for 120 beds can be erected and furnished for £17,000. Add to this £3,000 for hospital beds and the cost becomes £20,000 —the sum mentioned in the estimate.

"COST OF SHELTERS.—An Essex firm has already contracted to deliver and erect these in any part of Essex at £15 per shelter.

"ANNUAL COST OF DISPENSARIES:—

	£
Rent of 12 dispensaries, rates and taxes	720
*Caretaker, lighting and heating	350
Drugs and tuberculin and cod liver oil and malt extract ...	250
Stationery and printed matter	120
Carried forward	1,440

*There is no difficulty in obtaining caretakers who look after the dispensaries if allowed to live rent free and have coal and gas found. Where there is no resident caretaker a woman keeps all clean for a few shillings per week.

	£
Brought forward	1,440
Thermometers, sputum flasks, respirators, &c.	50
Six tuberculosis officers	3,000
One assistant officer	300
Travelling expenses	600
Salaries of nurses and travelling expenses	600
Repairs and renewals	120
Clerks at Central Office	160
Central Office expenses	200
Contribution towards salary of Chief Tuberculosis Officer ...	250
Contingencies, postages, &c.	280
	£7,000

"£7,000 is the amount taken in the scheme submitted.

"Cost of Maintenance in Hospitals and Sanatoria.

"The balance-sheets of various Institutions, many of which are willing to take early cases at 30s. per week, and on these terms make a certain amount of profit, have been studied. Advanced cases require a little more expense in nursing, and may be taken at 32s. per week. The two together average £80 per bed per annum.

"A friend who keeps a Sanatorium has kindly given Dr. Thresh all the details of cost and it works out at less than £80 per bed per annum. The financial statements of the large Isolation Hospitals confirm this figure. Your Committee think they may therefore take £80 as the average cost in a fairly carefully conducted establishment."

Annual Expenditure.

	By Insurance Committee. £	By County Council. £
On dispensaries... ...	... 2,333	... 4,667
„ Maintenance of 220 beds	(120) 9,600	...(100) 8,000
Office expenses	...	... 200
Principal and Interest (?) ...	...	... 660
	£11,933	13,527
		Less 6,764
		£6,763

FIRST SCHEDULE.

DUTIES OF TUBERCULOSIS OFFICERS.

1. To visit the homes of all persons suffering from Tuberculosis who apply for Sanatorium Benefit and such others as he may be instructed to visit by the Chief Tuberculosis Officer.
2. To fill in the forms supplied shewing the results of such visits, and supply a copy thereof, if required, to the Medical Officer of Health for the district in which the patient resides.
3. To examine all applicants for Sanatorium Benefit and any others who may attend at his Dispensaries, and to fill in the forms supplied for this purpose.
4. To transmit weekly the forms prepared in accordance with paragraph "2" and "3" to the Chief Tuberculosis Officer.
5. To examine all "contacts" and to keep proper records of the results thereof, and to notify all such as are found to be suffering from Tuberculosis to the proper authorities.
6. To take entire charge of any Dispensaries or Branch Dispensaries established by the County Council in his district. To attend at fixed hours approved by the Chief Tuberculosis Officer or ordered by the County Council; examine and treat all suitable cases, and select therefrom such as may require treatment in Hospitals or Sanatoria, and to keep all necessary records.
7. To visit all cases in Hospitals or Sanatoria in his district fortnightly and to keep records of dates of admission and discharge.
8. To report every fortnight to the Chief Tuberculosis Officer upon the condition of the patients, and recommend an extension of period of treatment where he thinks it desirable.
9. To treat, in case of grave emergency, a patient in his own home until the services of a panel doctor can be secured.
10. To keep all such records as may be required by the Chief Tuberculosis Officer and to prepare monthly reports on the work done in his Dispensary and District.
11. To arrange for the erection and removal of any shelter which may be supplied in his district, and to visit the patient therein from time to time to see that the Shelter is being properly utilised.
12. To send samples of sputum which may require examination for Tubercle Bacilli to the Chief Tuberculosis Officer at his Laboratory.
13. To consult with all the Medical Officers of Health in his district and by arrangement with them discharge his duties so as to assist them in carrying out the Regulations and requirements of the Local Government Board relating to Tuberculosis with the minimum of inconvenience to the patients and their families.

SECOND SCHEDULE.

DISPENSARY DISTRICTS.

No. 1 DISTRICT. DR. W. O. PITT.

Population, 260,000. Area, 9,570 acres.

Walthamstow, Leyton, Chingford.

Dispensaries at Walthamstow and Leyton. Sanatorium beds at Chingford.

No. 2 DISTRICT. DR. O. BRUCE.

Population, 250,000. Area, 16,630 acres.

East Ham, Ilford, Barking.

Dispensaries at East Ham and Ilford. Sanatorium beds at East Ham and Ilford.

No. 3 DISTRICT. DR. F. G. BUSHNELL.

Population, 167,000. Area, 184,000 acres.

Wanstead, Woodford, Buckhurst Hill, Loughton, Epping, Waltham Abbey, Romford, Tilbury and Grays Urban and Orsett, Epping, Ongar and Romford Rural.

Dispensaries at Romford, Grays and Woodford. Sanatorium beds at Orsett and Romford.

No. 4 DISTRICT. DR. J. D. MACFIE.

Population, 145,000. Area, 202,000 acres.

Southend, Leigh, Shoeburyness, Maldon, Burnham and Brentwood Urban and Rochford, Billericay and Maldon Rural.

Dispensary at Southend. Sanatorium beds at Heybridge (Maldon).

No. 5 DISTRICT. DR. A. S. MACNALTY.

Population, 160,000. Area, 253,000 acres.

Chelmsford, Colchester, Harwich, Walton, Clacton, Brightlingsea, Wivenhoe and Frinton Urban and Chelmsford, Lexden and Winstree and Tendring Rural.

Dispensaries at Chelmsford and Colchester. Sanatorium beds at Colchester.

No. 6 DISTRICT. DR. W. R. S. ROBERTS.

Population, 90,000. Area, 310,000 acres.

Saffron Walden, Halstead, Braintree and Witham Urban and Saffron Walden, Stansted, Dunmow, Braintree, Halstead, Belchamp and Bumpstead Rural.

No Dispensaries at present. Sanatorium beds at Braintree and Cressing.

An estate of 100 acres has been acquired near Chelmsford and plans are now being prepared for a Sanatorium to accommodate about 120 patients. So far matters have progressed very smoothly and within a year no doubt the scheme will be fairly complete and in working order.

At the time when the Medical Officers of Health were preparing their reports the scheme had not been elaborated and only certain of the Dispensaries established, hence they were not in a position to criticise it.

Some Medical Officers of Health, a large number of medical men, and nearly all the public appeared to think that every person suffering from tuberculosis was to be promptly removed to a Sanatorium and kept there until cured or death had occurred. Where the Sanatorium beds were to be obtained they did not stop to think, nor did the question of cost seem to be of any consequence. Some hundreds of persons have been sent to sanatoria for periods averaging three months, and the fact that very many have not been cured is causing a swing of the pendulum.

Too much has been expected as the result of the Tuberculosis provisions of the Insurance Act, and many are disappointed. Patience is needed and in time the beneficient effects of the Act and of the extended powers granted by the Local Government Board will make themselves felt, but many years must elapse before tubercular diseases are fully controlled.

There is fear lest too much stress should be laid upon the provision of Dispensaries and Sanatoria, with the consequent neglect of the housing and other social problems which are equally, if not more important. Moreover the eradication of the disease in human beings will only be possible when milk and meat cease to be sources of infection. This means that the campaign must be against Tuberculosis both in man, and in animals used for the food of man. Much is being done in this direction, and more will be done when the new Tuberculosis Order of the Board of Agriculture is being more fully enforced.

One important point in connection with the treatment of persons suffering from Tuberculosis has not yet received the attention it deserves. A large proportion of persons so suffering are unable to obtain the necessary amount of suitable food. The Insurance Committee can only spend a comparatively small sum on such ancillary treatment even for insured persons, and the County Council cannot provide any money for this purpose, and there are objections to its being provided by the Boards of Guardians. Yet provided it will have to be. Patients go into Sanatoria, where they are well and properly fed and they grow stronger and put on flesh. On an average they consume over 10s. of food each per week. They return home and have to live, very often on less than half this amount, with the inevitable result that the constitution is lowered, resistance is decreased and the disease again progresses. After-care Committees may do a little, but it will be very little, and be spasmodic and unreliable. The matter is one which cannot be left to any local committee, it is a national one and will have to receive national consideration. At present we supply cod liver oil with or without malt extract, but this is, in many cases, a very poor substitute for beef, or eggs or milk.

A large number of substantial shelters have been provided and are exceedingly useful. The provision of a good shelter is equivalent to adding a room to the house. It relieves overcrowding, keeps the patient sufficiently isolated, and enables him to obtain far more fresh air than he could possibly have in any room.

ISOLATION HOSPITALS.

The Hospitals in the County were fairly fully described in last year's Report.

All the permanent hospitals, save that at Colchester, receive an annual grant not exceeding £5 per bed (2,000 c. ft.), after being examined to see that they are well maintained and efficiently administered.

The Grants made for the year 1912-13 were as under :—

TABLE XX.

HOSPITALS.	No of Beds.	Grant per Bed.	Grant.
		£ s. d.	£ s. d.
Southend	36	5 0 0	180 0 0
Rochford	12	4 15 0	57 0 0
Grays and Orsett	20	5 0 0	100 0 0
Dunmow	Grant temporarily withheld.		
Saffron Walden	6	4 15 0	28 10 0
East Ham	42	5 0 0	210 0 0
Halstead	6	4 10 0	27 0 0
Romford Urban and Rural	42	5 0 0	210 0 0
Ilford	80	5 0 0	400 0 0
Walthamstow	84	5 0 0	420 0 0
Waltham Joint	42	5 0 0	210 0 0
Maldon ,, ...	10	5 0 0	50 0 0
Clacton	17	5 0 0	85 0 0
Chelmsford Joint	21	5 0 0	105 0 0
Braintree ,, ...	8	5 0 0	40 0 0

Total Grants ... £2,142 10s. 0d.

The Dunmow grant was withheld until the administration was improved.

The County Council, during the year, has given a great deal of time in the attempt to get the whole of the county adequately provided with hospital accommodation. As a result the Billericay Rural District is erecting a more modern hospital, Saffron Walden is adding an additional ward block, etc., Lexden and Winstree Rural District, Tendring Rural District, and Wivenhoe, Brightlingsea, Walton and Frinton Urban Districts have made temporary arrangements with Colchester for sending patients there, Witham is arranging to send patients to the Maldon Joint Hospital, and I hope that Burnham will arrange with the Maldon Rural District for a small hospital near

Southminster. An effort is also being made to combine the Halstead Urban and Rural Districts and the Belchamp Rural District, and to enlarge the existing hospital at Halstead.

Each district has some arrangement for isolating cases of small-pox. These admit of improvement and the County Council is endeavouring to arrange combinations of areas, each with a centrally situated hospital, which would always be ready at a few hours notice.

Barking. Some improvements are contemplated here and plans have apparently been submitted to the Local Government Board.

Brightlingsea. The Council possesses two marquees and land upon which to erect them. Although arrangements have been made with Colchester, no case has been sent to that hospital.

Burnham. The Medical Officer of Health says the cottage hospital has now been enlarged "bringing the accommodation in the hospital to 18 patients, while at the same time two different classes of infectious disease could be simultaneously treated. . . . It is now in charge of a responsible person who is periodically in attendance to clean and keep the premises aired, etc."

Chelmsford. The Medical Officer of Health says no provision has been made for the reception of cases of Enteric Fever, Cerebro-spinal Fever, or Anterior Poliomyelitis. "The borough is increasing rapidly, and increasing chiefly with members of the artizan class, who invariably live in cottages where there can be no adequate accommodation for nursing cases of Enteric Fever. . . I do not think that the permanent provision of 21 beds can be held to be sufficient for the increased number of infectious diseases that require proper isolation."

Colchester. The number of beds, 75 (including 20 for Small-pox) is the same as last year. The Small-pox hospital is about a quarter of a mile from the Isolation Hospital.

East Ham. There are 124 beds at this hospital, and the Medical Officer of Health says: "I know of no other hospital of this size where there are not one or more resident doctor." He also records "A fact worth noting is the improvement in the condition of the children admitted as regards cleanliness, due to the Medical Inspection of School Children. In the year 1900 nearly 50 per cent. of the children admitted had verminous heads, but it is now quite rare to admit a case in such a condition. There is no doubt that formerly this was the chief objection which some parents had against their children being sent to the hospital."

Leigh-on-Sea. This district could send cases to the Southend Hospital by arrangement. Now that it is to be merged into the County Borough cases will go there as a matter of course.

Leyton. The hospital here is of a temporary character, but it is said to give satisfaction to all concerned. A waiting room and porter's lodge have just been provided and other improvements made.

Southend. The erection of the new nurses' home and administrative block, the provision of which was sanctioned in 1907, has been commenced. A tender for £4,681 was accepted in June last. New stables, coach-house, coal store, etc., have been constructed, two bedding vans purchased, electric light installed in certain wards, and a bacteriological laboratory has been fitted up.

Tilbury. This Urban District, having been part of the Orsett Rural District, will continue to be part of the Grays and Orsett Joint Hospital area.

Walthamstow. By agreement with the local general hospital the Council have the use of three beds for cases of Enteric Fever. These more than sufficed during the year. At the Chingford Sanatorium (84 beds) a pavilion is being erected for about 20 cases of Pulmonary Tuberculosis.

Belchamp (R.) There is no isolation hospital accommodation in this district. The question of combination or arrangement with Halstead will shortly be considered by the County Council.

Billericay. Extra accommodation was required twice during the year. Whenever "even a small epidemic" occurs tents are required. Plans for an enlarged hospital have been submitted to the Local Government Board.

Lexden and Winstree. Referring to the arrangement recently made with Colchester, the Medical Officer of Health says: "The cases receive very good care and treatment there, but the expense is very great. This causes consideration as to the sending of cases, and an attempt is being made to get a reduction of the charge. There can be no doubt that we ought to have a hospital for the district, so that every case could be moved without any delay."

Ongar. This district has land and a tent hospital. When the Council was approached about more definite provision they undertook to endeavour to make an arrangement with a neighbouring authority. There is no record, however, of any result.

Orsett. The Joint Hospital here is being enlarged and improved, but no reference is made to it in the report. The Medical Officer of Health is not connected with the hospital however.

Tendring. The Medical Officer of Health says: "The County Council brought pressure to bear for the provision of isolation hospital accommodation for this district, and an arrangement was made with the Corporation of Colchester from last May to receive cases, but the fee of £3 7s. 6d. per week was almost prohibitive, although we found the isolation very useful in outbreaks that occurred. The fee has been reduced to £2 15s. per week, but I believe it would be better and cheaper to build a hospital for the district, and I believe this will be done at no distant date."

TABLE XXI.

STATISTICAL INFORMATION RELATING TO ISOLATION HOSPITALS APPLYING FOR A GRANT.

YEAR ENDING MARCH 31ST, 1913.

	Walthamstow.	East Ham.	Ilford.	Romford Joint Hospital.	Southend.	Orsett Joint Hospital.	Waltham Joint Hospital.	Chelmsford Joint Hospital.	Rochford Joint Hospital.	Clacton.	Dunmow.	Braintree Joint Hospital.	Saffron Walden Joint Hospital.	Malton Joint Hospital.	Halstead.
Total Number of Beds in Hospital	165	124	80	70	62	46	42	23	20	17	12	11	10	10	6
Number for purpose of Grant	94	42	80	42	36	20	42	21	12	17	8	8	6	10	6
Cases admitted during year —															
Scarlet Fever	223	330	210	101	103	102	79	46	36	30	13	24	57	8	4
Diphtheria	187	31	69	27	48	31	28	62	25	10	4	22	27	9	2
Typhoid Fever	3	8	—	1	10	18	1	—	4	2	8	4	—	1	—
Other Diseases	—	127	11	—	2	4	—	—	—	1	—	2	1	1	4
Total	413	495	290	129	163	155	108	108	65	43	25	52	85	19	10
Permanent Staff Residing in Hospital	37	38	33	19	15	16	10	11	5	4	3	3	4	5	2
Non-Resident Staff	4	13	7	1	4	2	2	1	2	1	1	3	1	1	0
Expenditure for year :—	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Structural Expenses	2290 1 8	1965 0 0	2052 11 1	885 8 4	879 16 8	618 3 5	806 6 1	630 16 6	302 5 7	261 5 10	379 2 3	391 4 8	70 2 7	384 7 6	213 12 10
Establishment ,, ...	4008 19 11	5393 0 0	4017 6 11	1874 15 3	2237 14 4	1282 3 1	1384 9 10	1529 6 9	517 18 10	521 10 9	481 9 4	813 4 5	509 14 9	590 4 7	206 7 6
Patients ,, ...	355 11 11	559 0 0	273 17 11	92 17 4	281 0 4	46 10 0	62 11 3	98 9 7	76 13 10	11 7 7	22 17 7	52 3 2	63 9 2	34 16 6	0 7 0
Total	7254 13 6	7817 0 0	6343 15 11	2853 0 11	3399 11 4	1946 16 6	2253 8 2	2258 12 10	896 18 3	794 4 2	883 16 2	1156 12 3	643 6 6	1009 8 7	420 7 4
Name of Clerk	C. S. Watson	C. E. Wilson	A. Partington	W. Smith	H.J.Worwood	James Beck	T. J. Tee	Leonard Gray	F. Gregson	G. Lewis	A. S. Floyd	F. J. Wiles	W. Adams	F. H. Bright	R. Morton
Details of Establishment Expenses :—	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Food, Appliances, Heating, Lighting, and Repairs	3044 14 0	3446 0 0	2152 17 5	845 2 3	1434 3 5	615 2 0	570 14 2	805 8 6	147 3 3	286 6 1	137 0 4	491 19 3	292 12 6	242 11 11	151 0 3
Rates, Rents and Taxes	459 12 9	140 0 0	140 9 3	178 5 0	161 12 6	58 15 0	129 3 1	54 3 0	36 19 1	12 5 5	35 19 3	17 13 3	14 4 8	13 18 4	15 6 3
Office and Other Expenses	87 19 11	40 0 0	52 10 10	94 14 4	70 7 3	109 4 6	95 18 6	131 18 8	17 0 9	4 1 2	8 15 0	26 15 10	31 2 3	31 16 11	1 17 6
Salaries	1625 13 3	1767 0 0	1671 9 5	756 13 8	571 11 2	499 1 6	578 14 1	537 16 7	316 15 9	218 18 1	299 14 9	366 16 1	171 15 4	301 17 5	55 8 10
Total ... ... £	4008 19 11	5393 0 0	4017 6 11	1874 15 3	2237 14 4	1282 3 0	1384 9 10	1529 6 9	517 18 10	521 10 9	481 9 4	813 4 5	509 14 9	590 4 7	213 12 10

SECTION III.

SANITARY ADMINISTRATION.

WATER SUPPLIES.

In last year's report I included analyses of all the public supplies in the County and referred to the different characters of the waters obtained from the deep wells in various parts of the County.

In 1901 I published a report on "The Water Supply of the County of Essex," and included therein a map showing that to the east of a curved line passing from Dedham in the north to Barking in the south the waters derived from the chalk (save at the Purfleet outcrop) were "soft" and contained more or less salt and sodium carbonate, whereas on the west of this line the waters had the ordinary character of chalk waters, that is, they contained very little salt and were free from sodium carbonate, but contained a considerable quantity of chalk in solution and were therefore "hard." I also pointed out that in many localities the beds between the base of the London Clay and the top of the Chalk yielded waters containing an excessive amount of lime and magnesium salts, chiefly sulphates.

In the map above referred to the dotted line is said to suggest a probable fault in the chalk. In some cases the marked difference in the character of the water derived from wells not more than, perhaps, 1 mile apart, seems to indicate the presence of a fault, but there is no other evidence in support of this suggestion, and my further investigations lead me to conclude that it is not necessary to assume the presence of a fault to account for the facts observed.

All the observed results admit of another explanation. So long as the water in the chalk contains carbonic acid it continues to dissolve the chalk and open out the fissures. When all the acid has been used up in dissolving the calcium carbonate it no longer possesses the power of opening out the fissures, and as the chalk becomes more compressed by the superincumbent mass of sand and clay it becomes so dense as almost to be impervious. Beyond this point therefore the water cannot travel in the chalk, and it comes up through the fissured chalk into the sands above and then becomes exposed to their softening action. The compact chalk acts very much like a fault would do assuming a solid impervious stratum abutting on a pervious one.

The following Table of analyses includes typical samples of water taken in Essex along a line almost north and south from the bare chalk of Foxearth through Halstead, Bocking, Braintree, Witham, Chelmsford and Billericay to Grays, where the chalk again outcrops. Note the amount of calcium and magnesium salts in the chalk waters at and near the outcrop, the diminution of this amount as the chalk gets deeper and the corresponding increase in the carbonate and sulphate of sodium together with the increase in the amount of common salt.

Source.	Foxearth.	Halstead.	Bocking.	Braintree.	Witham.	Billericay.
Calcium Carbonate	31·0	25·3	21·9	5·3	2·8	1·8
Calcium Sulphate	—	—	—	—	—	—
Calcium Chloride...	—	—	—	—	—	—
Magnesium Carbonate	—	2·3	4·4	5·5	1·2	2·8
Magnesium Sulphate	6·6	2·9	—	—	—	—
Magnesium Chloride	1·6	·2	—	—	—	—
Sodium Carbonate	—	—	3·1	19·8	26·7	26·3
Sodium Sulphate	—	—	9·0	11·8	10·8	9·4
Sodium Chloride	4·5	14·0	28·0	67·2	78·3	36·5
Sodium Nitrate	·2	·4	·2	·2	·2	·2
Silica, etc.	2·0	·9	1·0	·2	·5	1·0
Total	45·9	46·0	67·6	110·0	120·5	78·0
Hardness	40°	32°	26°	11°	5°	5°

The Table shows, however, that whilst the carbonates and sulphates of sodium increase approximately in proportion to the decrease in the corresponding salts of magnesium and calcium, the amount of common salt seems to bear no relation to any of the other constituents. This is better brought out in the next Table, which refers to a localised area which has recently had to be studied somewhat fully, viz., the Tendring Hundred, Mersea Island, and the Tollesbury districts. I have analyses of waters from about 50 deep wells in this area and the salt varies from 23 parts to 180 parts (or probably more) per 100,000, and it will be noted that some of the waters containing least salt are derived from wells near tidal estuaries, whilst many of the waters containing much salt are miles inland. The analyses of certain of the waters however indicate that tidal water is gaining access. This is well marked in the analysis of the Manningtree waters, No. 2 on the next Table. The Geological Survey refers to wells at Ramsey, Pewit Island, Frinton and other places which yielded brackish water and were apparently abandoned. Dr. Cook, Medical Officer of Health for the Tendring district, informs me that at Walton a well was bored and the water found to become more salt as the depth increased, the figures being :—

At 100ft.	Salt per 100,000 parts of water	257	parts.
At 200ft.	,,	,,	258	,,
At 360ft.	,,	,,	293	,,
At 360ft.	,,	,,	308	,,

A well sunk at Clacton gave me the results No. 3 on the same Table. The yield of water was trifling and upon continuous pumping the water became so brackish that it was abandoned. It will be noted that the water which rose naturally in the bore

was comparatively soft and contained sodium carbonate and no more salt than the deep well-waters of Mid-Essex. I am sorry that I did not obtain a sample of the water after continuous pumping but the Engineer informed me that it was so salt that no analysis was necessary to show that it was too brackish for domestic use.

Source.	1 10 per cent. Sea Water	2 Chalk. Manning-tree.	3 Chalk. Clacton.	4 Layer 568ft.	5 Marney. 900ft.	6 Mersea.
Calcium Carbonate	·8	23·5	5·3	1·4	6·3	5·5
Calcium Sulphate...	13·3	—	—	—	—	—
Calcium Chloride...	—	—	—	—	—	—
Magnesium Carbonate	—	6·5	4·2	·4	3·8	5·2
Magnesium Sulphate	21·9	7·2	—	—	—	—
Magnesium Chloride	36·7	1·8	—	—	—	—
Sodium Carbonate	—	—	22·0	39·1	29·2	32·5
Sodium Sulphate	—	—	16·1	12·7	12·4	22·9
Sodium Chloride	267·6	22·9	61 7	66·3	144·3	136·8
Sodium Nitrate	—	·2	2·6	·6	—	—
Silica, etc.	—	2·7	2·6	1·5	—	·6
Total	357·	64·8	114·5	122·	196·	203·5
Hardness	abt.100°	45°	11°	2°	11°	12°

There is no doubt that in this area the water varies in character at different depths. The salt in the Walton water shows this as does the analyses of waters taken from borings recently made at Layer Marney, Nos. 4 and 5. The yield at 568 feet was very limited, under 200 gallons per hour, and the boring was continued to 900 feet and blasts of dynamite used, but the yield of water was not materially increased and the proportion of salt increased to such an extent that the water was useless.

Layer Marney is so far from the sea that it appears difficult to ascribe this increase in the amount of salt to any direct influx of sea water, but my impression is that sea water or tidal water is gaining access to the chalk in the Thorpe-le-Soken area and at and near the chalk outcrop in the Stour Valley. The proof that these saline waters are derived from an admixture of sea water and chalk water is, I think, proved by the analyses of mixtures of chalk water and sea-water after passing through a filtering medium which can remove the calcium and magnesium salts more or less completely substituting sodium and potassium in their place. The mere proximity to the sea does not enable anyone tc say whether a water will be salt or not as a well near the coast may or may not contain an excessive amount of salt. For example compare typical waters from Brightlingsea with those from Mersea Island and Tollesbury.

I have made several experiments with mixtures of sea water and chalk water to show the effect of the softening process which I shall describe presently, and the following Table is designed to show how the various waters in the London Basin can be imitated by mixing chalk water with sea water and then submitting them to this peculiar treatment.

SEA WATER AND CHALK WATER.

Source.	Untreated	Treated.	Untreated	Treated.	Untreated	Treated.
Calcium Carbonate	12·7	2·0	25·2	1·0	24·3	3·8
Calcium Sulphate	29·0	—	—	—	—	—
Calcium Chloride	1·0	—	—	—	—	—
Magnesium Carbonate	—	1·7	2·5	·5	3·4	·4
Magnesium Sulphate	—	—	12·3	—	8·9	
Magnesium Chloride	10·3	—	6·6	—	—	
Sodium Carbonate	—	9·0	—	31·8	—	29·2
Sodium Sulphate	—	30·3	—	16·3	—	15·6
Sodium Chloride	103·5	118·8	113·1	126·2	72·0	73·0
Sodium Nitrate	—	—	—	—	—	—
Silica, etc.	—	3·2	1·	2·2	—	2·0
Total	156·5	165·0	161·	178·	111·0	124·
Hardness	40°	4°	40°	1½°	33°	5°

Varying proportions of chalk water and sea water were mixed, a portion reserved for analysis and the remainder filtered through Thanet Sand of varying thickness and of varying activity so as to remove a portion or nearly the whole of the calcium and magnesium salts. It will be observed that the lime and magnesium salts have been more or less completely removed and that the resulting filtrates are exactly of the type of the waters in the Tendring area as exemplified by the Tollesbury sample.

It would be difficult to regulate the rapidity of filtration or to vary the thickness of the filtering medium so as to remove exactly the right proportion of the salts of calcium and magnesium, but as we know that these can be removed to any desired extent the effect of the filtration can be easily calculated.

The next Table shows how a mixture of 2 per cent. of sea water with 98 per cent. of chalk water from Halstead would be altered by filtration through different thicknesses of sand.

HALSTEAD. CHALK WATER + 2 PER CENT. SEA WATER.

Source.	1 Untreated.	2 Treated.	3 Compare with Braintree.	4 Treated.	5 Compare with Witham.
Calcium Carbonate	27·3	5·3	5·3	2·8	2·8
Calcium Sulphate..	1·8	—	—	—	—
Calcium Chloride	—	—	—	—	—
Magnesium Carbonate	—	5·5	5·5	1·4	1·2
Magnesium Sulphate	8·0	—	—	—	—
Magnesium Chloride	9·8	—	—	—	—
Sodium Carbonate	—	16·7	19·8	25·2	26·7
Sodium Sulphate	—	11·4	11·9	11·4	10·8
Sodium Chloride	63·3	75·2	67·2	75·2	78·3
Sodium Nitrate	·3	·3	·2	·2	·3
Silica, etc.	1·0	1·1	1·2	1·3	·4
Total	111·5	115·5	111·1	117·5	120·5
Hardness		12°	12°	5°	5°

Braintree is about half way between Halstead and Witham. Assume that the water in the chalk at Halstead becomes mixed with two per cent. of sea water on its way to Braintree, and at the same time is traversing the Thanet Sands and becoming softened. Then the result at one stage would be the water (2) which, as will be seen, bears the closest possible resemblance to the Braintree water (3). Travelling onwards towards Witham the water would become still softer, more of the calcium and magnesium salts being removed, and at some point a water having the composition of No. 4 would result, and this it will be noted bears the closest resemblance to the Witham water No. 5.

Towards Chelmsford the water would become still softer, which is actually the case, but as the water in the Chelmsford area contains a little less salt we have to suppose that dilution with a less saline water is taking place, probably from the neighbourhood of Saffron Walden. By varying the source of the chalk water and the proportion of sea water, I think every water from the chalk and Thanet Sands in the County of Essex and under London could be imitated.

Assuming that the salinity is due to sea water, then the bromides which exist in sea water should be capable of detection in the saline waters. This proved to be the case, but when it came to the question of estimating the amount great difficulties were encountered, and have not yet been entirely surmounted. I give the following figures with some reluctance, but I think they can be depended upon for the purposes of comparison.

CHLORINE AND BROMINE IN SEA WATER AND ESSEX DEEP CHALK WATERS.

	Chlorine in 100,000 parts of Water.	Ratio of Bromide to Chlorine.
Sea Water, Clacton	1885	1 to 274
* ,, Blackwater Estuary	1850	1 to 328
,, ,, ...	1850	1 to 378
Tollesbury Deep-well Water	75	1 to 225
*Chelmsford ,, Water	35	1 to 250
,, ,, ,, ...	35	1 to 322
Maldon ,, ,, ...	50	1 to 442
Tillingham	76	1 to 317
Barking...		1 to 312

*Two separate determinations of each water shewing variation in results due to difficulties in analysis.

The proportion of bromides to chlorides is therefore much the same as in sea water, whether the saline water contains as much salt as the Barking water, or little salt like the Chelmsford water.

CHALK WATERS.

Source.	1 Barking Town.	2 Barking Creek, Well at.	3 Barking Creek, Well at.	4 Thames. Grays. River.	5 Grays. Heavy Pumping. Chalk	6 No Pumping. Well.
Calcium Carbonate	5·3	28·2	29·8	16·3	25·0	17·1
Calcium Sulphate	—	2·5	—	71·4	28·4	4·8
Calcium Chloride	—	—	—	—	—	—
Magnesium Carbonate	1·4	—	—	—	—	—
Magnesium Sulphate	—	7·4	13·1	129·5	8·8	1·6
Magnesium Chloride	—	18·6	9·9	154·8	24·6	1·7
Sodium Carbonate	14·9	—	—	—	—	—
Sodium Sulphate	9·9	—	—	—	—	—
Sodium Chloride	7·0	112·5	75·9	1411·6	140·4	2·6
Sodium Nitrate	—	—	—	—	—	—
Silica, etc.	·5	·8	1·3	70·4	15·8	4·2
Total	39·	170·	130·0	1854·	243·	32·
Hardness	7°	55°	50°	330°	78°	24°

The Barking water was especially selected, because there is no manner of doubt that tidal water is entering the chalk here. From Grays to London, tidal waters is

getting into the chalk at divers places, and frequently in such quantities as to render the water derived therefrom useless for manufacturing or domestic purposes. A further proof is the effect of pumping. The lower the water is reduced, the more and more closely does the water pumped resemble the tidal water of the Thames in composition.

Moreover, cases are recorded of the rise and fall of the water levels under tidal influence, as for example Thames Haven, where I am informed that the water in the bored well rises and falls with the tide, and this is confirmed by the note in connection with this well in Whitaker's "Geology of London." Evidently in this locality there is some connection between the chalk and the river.

The Barking waters are very interesting. Away from the river (1) they resemble the chalk water of the Lee Valley partially altered by filtration through Thanet Sand, but near the river they consist of a mixture of this chalk derived from water and river water. Nos. 4 and 6 show the effect of the Thames water on the Grays Wells when heavily pumped.

In a communication made to the Essex Field Club in March, 1912, and published in the *Chemical News*, I shewed that the Thanet Sand possessed the previously unsuspected power of softening hard water which was filtered through it, and that the calcium salts present in the hard water were replaced by sodium salts during the process, and I summarised the results of my experiments as follows :—

1. That the Thanet sand from beneath the London clay, possesses the power of softening hard water, by substituting sodium (and possibly potassium) salts for those of calcium and magnesium.

2. That the constituents to which this softening effect is due is not removed by treatment of the sand with dilute acid, but appears to be removed by treatment with strong hydrochloric acid.

3. That this property of softening water belongs both to the clayey and sand matters.

4. That the softening effect is greatly increased by treating the sand with brine.

5. That the amount of alkali removable by this softening effect is only a small proportion of the total alkalies contained in the sand.

6. That (within certain limits) a sand which has ceased to soften a water of a certain degree of hardness, will exert a softening effect upon a water of a greater degree of hardness, and will exert a hardening effect upon a water of a softer character.

Whatever the constituent of the sand which effects this change it is certain that the alkaline carbonates and sulphates, found in the waters derived from the Chalk and Thanet Sands in the London Basin, are obtained from the sands by substitution of sodium for calcium and magnesium in the sulphates and carbonates of calcium and

magnesium present in the water before it commences to percolate through the sands. The analyses submitted show that every sample of such water can be imitated by passing a chalk water either without admixture, or with an admixture of a small proportion of sea water, through Thanet Sand, which has retained its softening powers. If we assume, and such certainly appears to be the case, that the Thanet Sands were deposited at the bottom of the sea, it is obvious that they would acquire the power to substitute sodium and potassium for the calcium and magnesium in any chalk water with which they came in contact afterwards, and thus soften the water. If any salt remained in the sands this would be taken up by the water and the chlorides would be proportionately increased. In the districts in Essex and elsewhere where these alkaline waters are found there are localities where the amount of salt in the water is excessive, and most of these, but not all, are near the coast or tidal rivers, and the question may arise whether the salt now found in such waters is derived from prior evaporation of the water from the original sea or from sea waters getting into the chalk at various places at the present time. My impression is that it is due to an actual admixture of sea water getting into the chalk and sands around the coast and in the Thames and Stour Estuaries, and that this tidal water gets more and more diluted with true chalk water the further it travels from these points. Thus in the Tendring Hundred most of the waters contain a comparatively large amount of salt, and further away from this district the salt decreases. Towards the south of the county the chlorides are comparatively low, due to more copious admixture with water from the Hertfordshire chalk. I might mention that in all these areas the water derived from the chalk is practically identical with that derived from the Thanet Sands; where there is any difference the salinity increases with the depth of the boring, *e.g.*, Layer Marney and Walton-on-the-Naze. At Chelmsford and Braintree I have been able to get waters from the two sources, and found them practically identical. At Ingatestone there was no water whatever in the Thanet Sands, but the limited amount obtained from the chalk was a typical alkaline water. These waters contain no free carbonic acid, therefore whatever distance they may travel in the chalk no solution of the chalk occurs, hence, however much of the water is pumped the fissures do not enlarge and do not yield water more freely.

Engineers persist in continuing the borings made in Central Essex into the chalk but there is no evidence of more water being obtained than would have been the case had the boring ended in the sands, whereas there is evidence that some of the sand water is lost. Thus at Writtle a certain amount of water was obtained from the Thanet Sands and when the boring pierced the chalk most of the water disappeared and the chalk had to be plugged to restore the supply. At Tollesbury where a deep bore has just been made the water level fell some 15 feet when the chalk was pierced, a sure indication of a loss of water. Experience elsewhere, which I am not at liberty to mention specifically, proves that the chalk absorbs rather than yields water in those areas where it is covered with a large thickness of London Clay. In any case the waters have a common origin, and if the chlorides are derived from the sea they should be accompanied by bromides and the amount should be approximately the same in proportion to the chlorides as in sea water. In sea water, as before stated, I find that there is one part of bromine to from 274 to 378 parts of chlorine, and that in the

alkaline waters the proportions vary, there being for 1 part of bromine from 225 to 442 parts of chlorine. Considering the difficulty of making anything like an accurate estimation of the bromine these figures are sufficiently close to indicate some relationship. The difficulty of making an exact determination led me to abandon temporarily further determinations until I had worked out a process which could be relied upon. This has proved far more difficult than I had anticipated and I am not yet so certain of my results as to feel justified in giving others. I suspect that in sea water there are other compounds of bromine besides bromides, and that there are traces of iodides or iodates or both. This however is a chemical question upon which I shall have something to say elsewhere.

Possibly it may be asked whether the softening effect of the Thanet Sands is sufficient to account for the removal of nearly all the calcium and magnesium salts from the large volume of water taken from the sands. I think there can be no doubt about the answer. Taking Essex alone the area under which Thanet Sands exist must be about 666,000 acres and assuming the average thickness to be 12 feet (a very low estimate), and that each cubic yard contains 28 gallons of water, the water held in the whole of the sand will be about 360,000,000 gallons. But my experiments indicate that each cubic yard would completely soften 10 cubic yards of a chalk water 30° of hardness. The amount of water the Thanet Sands are capable of softening on this basis is therefore 21,600,000,000,000 gallons.

Essex (Administrative County) has a population of over 1 million and if liberally supplied with water it would use 30 million gallons per day, 10,950 million gallons per year. The amount of Thanet Sand under the County would completely soften the whole supply on the above basis for 2,000 years, and partially soften for a much longer period. I have recently obtained sandy matter from the beds resting upon the Thanet Sand to ascertain if they have similar properties. Mr. Whitaker recognised this sand as being from the Blackheath Beds. The sand contained much clayey matter, but it undoubtedly had the same action as the sand resting upon the chalk. The mineral or minerals which possess the power of softening water are probably very widely diffused and I should like if possible to definitely identify them.

The subject is of more than local interest, as these alkaline waters appear to occur in the most diverse formations from the Volcanic to the Upper Eocene, and in all parts of the world.

The Geological Survey Department has decided to publish an Official Memoir on the Water Supplies of Essex, and the work has been entrusted to Mr. W. Whitaker, F.R.S., any myself. The work is well in hand and will probably be issued during the coming year. The following are the chief references made to the public water supplies in the Annual Reports.

METROPOLITAN WATER AREA.

Buckhurst Hill. From the Metropolitan Water Board deep wells at Waltham Abbey and Chingford Mills. The water is hard but the supply is constant and adequate.

CHINGFORD. It is hard, but perfectly pure.

EAST HAM. The supply is constant and of good quality. Most houses in the Borough which previously had storage cisterns now have a supply direct from the mains.

ILFORD. The Metropolitan Water Board supply the portions of Ilford lying west and north of Cranbrook Road. The remaining portion is supplied by the South Essex Company. As the mains are extended shallow wells are closed and the public supply laid on.

LEYTON. The Metropolitan Water Board continue to supply the district with a plentiful quantity of good wholesome water.

LOUGHTON. Derived from deep wells in the Lea Valley. It is hard but pure.

WALTHAM HOLY CROSS. Periodically examined, chemically and bacteriologically, results always satisfactory. Occasional turbidity arises from sediment in a main being disturbed, and on one or two days a "milkiness" was observed, due to air under compression.

WALTHAMSTOW, WANSTEAD AND WOODFORD. Supply constant; no complaints received in any district.

SOUTH ESSEX WATER CO.'S AREA.

Many samples of water from the South Essex Company's mains have been examined during the year in the County Laboratory, and all were found very satisfactory.

The following references were made to the supply:—

BRENTWOOD. The town has had a constant supply . . and there has been no complaint during the year.

GRAYS. Supply constant and plentiful. The reduction in the hardness was maintained, repeated tests giving an average of 12 degrees.

ROMFORD. Supply good and constant. All parts supplied except Noaks Hill.

BILLERCAY (R.) Supply continuous and plentiful. "I am strongly of opinion that the South Essex Water Co. should have the power, and be requested to extend their mains to supply the more crowded parts of Ingrave and East Horndon." "The Company has, by arrangement with the Authority, extended its mains to Childerditch, and further in South Weald up to Gilstead Hall."

The Company also supplies Tilbury, part of the Orsett Rural District and the Romford Rural District. No complaint is made in any report either as to the quality or quantity of the water, nor as to the remissness in extending mains when requested.

SOUTHEND WATER CO.'S AREA.

No complaint of any kind is made against this Company. This Secretary recently furnished me with the following list of parishes in their area of supply:—

The Borough of Southend:—	Bowers Gifford
Southend-on-Sea	Leigh-on-Sea
Prittlewell	Basildon (Chapelry)
Southchurch	Downham
Barling	Dunton
Eastwood	Great Burstead
North and South Shoebury	Laindon
Shopland	Lee Chapel
Sutton	Little Burstead
Great and Little Wakering	Mountnessing
Thundersley	Nevendon
Fobbing	North Benfleet
Langdon Hills	Ramsden Bellhouse
Vange	Ramsden Crays
Pitsea	Wickford

This will now have to be extended as the Company has purchased, with the consent of Parliament, the waterworks of the Rochford Rural District Council. The difficulty experienced in supplying this important area can be gathered from the following abstract from the Report of the Medical Officer of Health for Southend-on-Sea:—

SOUTHEND. The water is derived from deep wells, of which there are 24 scattered all over the south-eastern portion of the County, some being 20 miles away. An additional pumping station at Wakering Wick is nearing completion. The average cost of a well and pumping station is £18,000, and the average amount obtainable from each well daily is 100,000. In order to prevent any possibility of failure to supply in summer, the company is sinking additional wells and providing new storage reservoirs. Storage for 15 million gallons has already been provided and 9 millions more will be provided for this year, making a total storage of 24 million gallons.

A Bill is being promoted in Parliament for the purchase of the Rochford water undertaking. This cannot be regarded as prejudicial to the inhabitants of the Borough. Seeing that under the more skilled management of the Company the existing deep well, which will be taken over, is likely to suffice for some years for the added population. So far from being a disadvantage to the Borough, it is possible that the project may be a distinct advantage, inasmuch as the Company will thereby be provided with a very large area in which to sink additional wells when such become necessary, owing to the growth of the Borough. The water is regularly submitted to examination. It is very soft and very wholesome.

LEIGH-ON-SEA. The district has a constant and abundant supply. The excellent service and the purity of the water are valuable assets to the health of this district.

In the Rural areas mains have been extended in various directions, and the development of the districts rendered possible.

All the wells owned by the Company are examined every spring by me and samples collected and examined bacteriologically in the County Laboratory. Quarterly samples are also examined for the Company, these being taken each quarter, one from Southend Borough, one from Leigh, and one from any part of the rural area which I may select. No new well is brought into use until the water has been passed by me as being perfectly satisfactory.

THE HERTS AND ESSEX AREA.

The water supplied by this Company in the Epping and Ongar districts is invariably of great purity, but it is very hard. The Company has been approached to ascertain if they cannot adopt some softening process. It is not a large Company and it supplies a very thinly populated area, hence the cost of softening is so great, comparatively, that the Company are reluctant to put down a plant.

Epping (U.) The water is derived from the chalk beds at Sawbridgeworth. The hardness of the water is sometimes complained of, and there is no doubt, as has been pointed out before, that if means were adopted to reduce this hardness it would distinctly improve the quality of the water for culinary and other domestic purposes. The water is constant and under pressure.

Epping (R.) The mains of the Company have been extended nearly two miles during the year through Middle Street, Nazeing, and the adjacent houses have been supplied. A number of houses in other directions have been connected with the mains. It is not improbable that during the coming year the Company may extend their mains to Burnt Hill, Netteswell, and other localities where supplies are most wanted. It is a difficult matter to secure supplies to houses scattered over such a wide area, " but the progress which has been and is still being made is most satisfactory and encouraging."

Ongar. The Company supplies the parishes of Chipping Ongar, Bobbingworth, Greenstead, Lambourne and Stanford Rivers.

Dunmow. The Hatfield Broad Oak Water Co., which takes its supply from the Herts and Essex Water Co., continues satisfactorily to supply Hatfield Town and Heath.

TENDRING HUNDRED WATER CO.'S AREA.

Dr. Cook's report for the Tendring Rural District gives the following interesting account of this Company's origin and progress :—

" In the early part of my service the water supply of the district was entirely from shallow wells made in the old-fashioned way of bricks laid dry, so that water got into the well at all depths frrom the surface downwards, but in the year 1883 the late Mr. Peter Bruffs, of Ipswich, was the means of creating the Tendring Hundred Water Company, with deep wells into the chalk at Mistley and Bradfield to supply Harwich

and Dovercourt and the surrounding country, and in 1884 the first Act of Parliament for the Company was procured. Since then the works of the Company have been greatly extended and three more Acts have been obtained, so that at the present date the Company supplies Harwich, Dovercourt, Parkeston, Frinton, Walton-on-the-Naze, and the intervening country with most excellent water, with a constant supply. The last Act was passed last session and the supply will be extended to Dedham and Ardleigh and a large tract of country from the new well in the chalk at Dedham (501 feet deep), besides yielding a much increased supply to the localities previously receiving it."

He adds : " Water is very much wanted on a large building estate in the parish of Little Holland and for about two miles in length, through the village of Weeley, also the villages of Great and Little Oakley, all on the Tendring Hundred Company's line and limits of supply. Promises have been made by the Company for these extensions, but they are slow in their proceedings."

Possibly the Company have some explanation to offer for the delay.*

HARWICH. The water supply still maintains its high standard of excellence and has been several times examined both chemically and bacteriologically.

FRINTON. The storage reservoir here holds 50,000 gallons of water. The supply is plentiful and good. A new 10in. main has recently been laid to the centre of the town.

WALTON. The supply has been ample and good.

OTHER PUBLIC SUPPLIES.

BRIGHTLINGSEA. Excellent quality but hard. From two bores into the chalk. Being harder than some of the shallow well waters, certain inhabitants perfer the latter. The Medical Officer of Health suggests softening. Average amount supplied 16·3 galls. per head per diem.

BURNHAM. Water from deep and shallow tube wells. Average supply 11 galls. per head per diem. The mains have been extended 1½ miles to the Hamlet of Ostend and an elevated tank of 5,000 galls. capacity has been provided. Quality excellent.

CHELMSFORD. The Medical Officer of Health reports very fully on the water supply, and especially upon an alarming experience which occurred in the early summer." The water from the springs in Admiral's Park was unexpectedly found to be polluted. The question then arose how to trace the pollution of this water. It seems a strange fact that this well having been in constant use now for about 30 years no one was able to state the actual source of this water or the actual direction of its flow from source to the position of its outcrop. In my opinion the collecting ground is in the higher ground in the neighbourhood of the Easters and that it

*In a recent letter received from the Secretary he states that they circularised Weeley in March, 1912, and only received applications for the supply of three cottages. They have also circularised Great Oakley, having already laid the main through the village. The main also goes through Little Oakley and they are only too anxious to supply water, but they receive no applications nor any orders from the District Council.

probably runs through the Chignals across the back of Writtle Wick, across the Hill Farm down to Admiral's Park. That is only my opinion, and on such grounds only it would be futile to examine all the waters found in this line of country. With the well dry there appears to be three separate springs cropping up in the well bed To ascertain if any connection existed between this well and the wells on Bundicks Hill side with Dr. Thresh's concurrence (Dr. Thresh most kindly gave us the benefit of his advice and experience) the well on Bundicks Hill was deeply stained with Fluorescene but at the end of five days no stained water shewed itself in the well. At the same time, at Dr. Thresh's suggestion, holes were dug into the ground on the further side of the well about 3 feet in depth and and were filled with water deeply stained with Fluorescene, none of which appeared in the well. At this time it was found that it was possible for the water from the well roof to get into the well and had apparently been doing so for some time through the well wall after running on to the ground. The possibility of the contamination having arisen in this way was fully considered and appeared to be quite feasible. This was at once corrected, the well itself and the roof were thoroughly cleaned, a cemented troughing was run round the whole of the well to prevent any possibility of any washings from the roof again getting into the well, the tank itself having been thoroughly cleansed and painted. The well was allowed again to fill. Samples of water were sent for analysis to Dr. Dyer and to Dr. Thresh both of whom reported most favourably on the water, proving that the source of contamination had been removed and that the water was quite pure. On June 28th the water was again used for domestic purposes in the Borough."

The Medical Officer of Health also points out the risk of such a rapidly growing community relying upon spring waters. He " therefore once more urges that a further supply of water from a deep well should be obtained at once ; this supply should not give less than 200,000 gallons as a daily supply and that Admiral's Park and Burgess Well should be used only when necessary as a reserve."

A boring has been completed near Galleywood and a yield of about 100,000 gallons per day of good water obtained.

Clacton. The present supply is spring water filtered through sand beds. Arrangements are being made for putting a deep bore into the chalk in order to supplement the supply from this source.

Colchester. Supply from a deep well in the chalk and from springs. The water is frequently examined and invariably found excellent in quality. The average daily supply per head is 18·35 gallons.

Halstead. The well at the waterworks has been deepened 50 feet, and the amount of water available increased. New and larger mains are required for the supply of Tiding's Hill.

Maldon. An attempt to increase the yield of water by boring at the Spital Road well proving futile, attention was directed to the Wantz Road well. This was deepened 156 feet and the yield of water very greatly increased. The Medical Officer

of Health says: "The total water supply is thus raised to from 150,000 to 170,000 gallons, or 24 to 27 gallons per head of the population, irrespective of private wells. Surface wells and springs, liable to pollution, are still used by a certain number of people."

Shoeburyness. Some improvements, obviously of an important character, have been effected here during the year. The Local Government Board sanctioned a loan of £2,311, and a new pumping plant has been installed and the yield of water augmented.

Saffron Walden. The supply is from a deep bore into the chalk and the water is softened before distribution. The pressure afforded by the town service reservoir is not sufficient to carry an adequate supply to the houses situated in the upper part of the town and to a considerable number of houses which are being erected on the Debden Road. With a view to overcoming this difficulty a high level water scheme has been prepared for providing a cast iron tank on a brick tower at an elevation of 353 feet above Ordnance Datum, which will give an increased pressure of 20 lbs. per square inch. An application was made to the Local Government Board for their sanction to a loan of £2,470 for carrying out the work, and an Inquiry was held at the Town Hall on June 4th, by A. A. G. Malet, Esq., an Inspector of the Local Government Board. The loan has been sanctioned and tenders have been invited for carrying out the work. Careful records are kept of the level of the water in the well. I wish other authorities would also keep such records, as they are often of great value.

Witham. No change to record. Water from deep wells. Satisfactory.

Wivenhoe. No change to record. Water from deep wells. Satisfactory.

Rural Districts in which changes are recorded :—

Billericay. Already referred to under "South Essex Water Co.'s Area."

Braintree. The Bocking Waterworks have been completed and an ample supply obtained more than sufficient to meet the demands of the parish. It is of exceptional purity but somewhat hard.

Chelmsford. Although many improvements and main extensions are chronicled few need mention. At Writtle the oil engines have been converted into gas engines. The trial boring at Broomfield was successfully completed and the Council is proceeding with a scheme for supplying that parish. When these works are carried out the Rural District will have two deep wells yielding far more water than the areas supplied require. One of these is already connected with the Borough mains and the other will admit of being connected. Last year this connection proved of the greatest value to the Borough during the period when the Admiral's Park well was out of use.

Dunmow. The conditions which obtain in all our Rural areas not having a supply from mains is so like that at Dunmow that I reproduce the whole of the

remarks of the Medical Officer of Health. They shew also that great improvements have been effected and are contemplated in this district.

"With the exception of Dunmow, Felstead and Hatfield Broad Oak, which have proper water supplies, the remainder of the district depends upon public and private wells and springs. Unfortunately some few hamlets have not even these and have to depend on ponds. In some few instances the water from springs is gravitated to the roadside and delivered from a spout, but the amount of time and labour wasted throughout the district in pumping water from wells and carrying home cans must be enormous. However, if the source is reasonably free from pollution originally and properly protected this kind of thing must continue in the smaller villages and hamlets, at least for a time. Thaxted is about to have a public supply, and Great Bardfield would certainly be benefitted by one, as many of the houses in the north of the village have no adequate supply, and the generality of the wells are polluted with sewage. The conditions are not, however, so entirely disgusting as those prevailing in Thaxted, and here, I am glad to say, some progress has been made during the year. Mr. Mackenzie-Richards has prepared a scheme for the latter town, the estimated cost of which, for works only, come to £5,277. As, however, Thaxted is also considering a scheme for sewerage and sewage disposal works, the Rural District Council found that £5,277 would be more than the parish could legally borrow, and Mr. Richards was requested to modify his scheme. The amended scheme is now under consideration and I hope something will be done in the coming year.

"The Hatfield Broad Oak Water Company, which takes its supply from the Herts and Essex Waterworks continues satisfactorily to supply Hatfield Town and Heath.

"During the year the works of the Dunmow Company were purchased by the Council for £2,500, an application to borrow £3,000 being the subject of a Local Government Board Inquiry in September. The application was favourably reported on and the sanction of the Board subsequently obtained, the amount to be repaid in 30 years. This includes the works at Felstead, and, as both supplies are of good quality, and the works good and cheap, water should be supplied at a low rate. At Dunmow the water is obtained from a deep chalk well, and at Felstead from a strong spring properly protected by an iron cylinder. In both cases the water is pumped by engines to a distributing tank at a high level.

"During the year certificates have been granted for 15 newly erected dwelling houses under Section 6 of the Public Health (Water) Act of 1878 and in each case, where the water supply was not a public one, it was investigated by analysis before the certificate was granted."

In all Rural districts the quality of the water should be obtained before certificates are given. This is now becoming general, but it is not done as a matter of routine in every area.

HALSTEAD. There is no public supply from mains in this district, but Earls Colne and portions of adjacent parishes will probably be so supplied when the waterworks at Earls Colne are completed. The works are in progress.

Lexden and Winstree. A deep well is being sunk here for the supply of Stanway, a suburb of Colchester. A scheme for the supply of the parishes of Abberton, Langenhoe, Messing, Salcot and Virley was prepared by a firm of engineers but it was dropped on account of the expense. This is a misfortune as these parishes are sadly in want of a water supply. (West Mersea is another and much more populous parish also in need of a water supply.)

Maldon. A public supply for the village of Heybridge has been completed at a very reasonable cost. The L.G.B. sanctioned a loan of £600 for mains, etc., and water is supplied from deep wells at Messrs. Bentall's works. The parish has now an excellent water supply.

The scheme for supplying Tollesbury makes little progress, but it has been sanctioned by the Local Government Board and no doubt will be gone on with.

Trouble has arisen in the Purleigh area on account of the difficulty of getting an adequate supply from the mains at certain elevated points. An engineer has been consulted and probably the difficulty will be surmounted. The public supplies from the Southminster and Tiptree works continue satisfactory. An arrangement has been made with the Burnham Urban District Council for the supply of Creeksea from their mains.

Rochford. This area has already been referred to in connection with the Southend Water Co.'s area.

Saffron Walden. The Medical Officer of Health gives a description of the supply to each parish. The County Council took an interest in the supply to Wimbish and probably as a result thereof Miss M. W. Gibson sunk a bored well, erected a windmill pump, etc., and presented the works to the parish. Lord Strathcona also enclosed a spring and erected a pump for the public use. In Clavering the Rural District Council has sunk a well 155ft. deep and fixed a deep lift pump. The Local Government Board sanctioned a loan of £150 and the work cost £136 8s. 3d.

Stansted. A private water company supplies Stansted from a deep well in the chalk. All other villages are supplied from shallow wells.

Tendring. Referred to under "Tendring Hundred Water Co.'s area."

Upon the whole the county is exceedingly well supplied with water. Even in the Rural Districts there must be some hundreds of miles of water mains ramifying in various directions. Notwithstanding the curious character of most of the deep well water it is undoubtedly wholesome. The statements made in the public press about the Coggeshall water has led to many communications being addressed to me. Usually the question asked is if the water really has anti-rheumatic effects. So many of these applications referred to Coggeshall that I began to think there were possibilities of its becoming a popular health-resort. Unfortunately, I have to say that there are many other districts in Essex where similar water is obtainable, and there is a tendency for people to think that anything which is particularly abundant cannot be very good. From what I can gather there is reasons for believing that

these alkaline waters are beneficial in cases of rheumatism. Of one thing I am fairly certain, namely, that if this kind of water was only found in limited quantities and in some foreign country it would be vaunted as a cure for many other diseases besides rheumatism, and people would flock there to bathe in it and drink it.

The public supply in the County has not been found to have any action on lead.

SEWAGE WORKS, RIVER POLLUTION, &c.

These matters receive a good deal of attention from the County Council and all the rivers in the County are kept under supervision. The effect has been most marked, especially in the Roding Valley, where the river, which was rapidly becoming an elongated cesspool, is now so greatly improved that no complaint is ever received about the condition of the non-tidal portion. The Chelmer comes next in importance and commencing near its origin the County is insisting upon the sewage of Thaxted and Dunmow being properly treated. Other parishes lower down are also receiving attention. Broomfield is to be sewered after the water scheme is completed and the Borough of Chelmsford is considering a sewerage scheme which should prevent every little storm washing sewage into the river through the storm overflows. The Colne is another stream which receives a good deal of sewage and which will have to receive more attention than it has hitherto done. Halstead town has greatly improved its sewage work and if these are successful the chief source of pollution will have been satisfactorily dealt with.

Future work, however, may have to be modified in consequence of the Report of the Royal Commission on Sewage Disposal. Time after time I have had to report that sewage from certain parishes entered a river, but that half-a-mile or a mile lower down no trace of it could be found upon analysis, and that little or no local nuisance was caused. This discharge is an offence under the River Pollution Act, but apparently the Royal Commissions would not regard it as objectionable, but even as permissible. In their Eighth Report, par. 32, they suggest that partially purified sewage should be diluted with 150 to 300 times its volume of river water, and *crude sewage* with 500 times its volume, with the proviso that the condition of the river must be such as to prevent the accumulation of solids in any particular spots to an extent likely to cause a nuisance. In other words, crude sewage may be discharged into a river providing that no local nuisance is caused and the amount is not more than one five hundredth part of the flow of the river. Hence a small stream with a flow of one million gallons per day could receive 2,000 gallons of crude sewage. If this quantity is not exceeded, and the solid matters are kept back, the effect upon the river is in their opinion negligible. Unfortunately I do not remember noticing in any of their voluminous reports whether they have considered the question of the effect of such diluted sewage upon cattle which may have to drink it. They are very careful to impress the fact that such a polluted water could not be used for drinking purposes, but they do not say whether it will be safe for persons to bathe in it. Certainly they cannot bathe without drinking some of the water, hence probably they would regard it as unsafe for bathing purposes.

The Commissioners have also suggested new standards, and our rivers will have to be examined afresh to ascertain how they compare with these standards. Time only will tell whether their method, which takes five days to complete, is any better than older and well tried methods which gives us definite results in five hours.

One of their series of observations was made, at my suggestion, on the River Chelmer below the Chelmsford sewage works, and their results are quoted under "Chelmsford" in the following summary :—

THE THAMES VALLEY.

The Thames, and its tributaries to a certain extent, are under the jurisdiction of the Port of London Authority, which appears to strain at gnats and swallow camels. This authority has recently prosecuted the Rochford Rural District Council for permitting a trickle of partially purified sewage entering the Thames at Canvey Island. The amount was not 1/500 of the flow of the Thames, but many millions of times smaller. A technical offence was probably committed and the magistrates had to inflict a nominal penalty. The London sewage works discharge an effluent probably as bad, but a million times more in amount, without let or hindrance.

Barking and East Ham discharge their effluents into Barking Creek near where it joins the Thames. Ilford discharges its effluent into the Thames just below Creeksmouth. Grays, Leigh, and Southend also discharge into the river.

Barking. The sewage is chemically treated. The Medical Officer of Health does not refer to the subject. The water in the tidal basin in the town is far better now than it used to be but in summer it is still foul and liable to give off an offensive odour. This must be due to foul matter coming up the creek from the London, and possibly other, sewage outfalls, the filth and mud cannot possibly come down with the stream.

East Ham. The sewage is first treated chemically and the clarified liquor sprinkled over bacteria beds. Many samples have been examined at the County Laboratory and an excellent standard is obtained. No complaint has been made by the Port Authority or anyone else as to its character.

Ilford. A new sewer has recently been laid in Goodmayes. A few cesspools remain in outlying areas. The sewage is treated on bacteria beds, but I do not know the character of the effluent. Doubtless it is satisfactory to the Port Authority. This Authority has, however, complained about a surface water drain which discharges into the Roden at the bottom of Roden Street. The connections with this drain have been followed up, but apparently it receives nothing but surface water. Another complaint was found to be due to the accidental discharge of some malt liquor into a surface water sewer. The Medical Officer of Health says:—"There is a general impression that the foul and unsightly condition of the lower part of the Roden is due to pollution from up stream, but I think there is no doubt it is the other way—comes up with the tide and becomes deposited."

LEIGH. Sewers are continuously being laid to keep pace with the rapid growth of the district. The sewage is treated bacteriologically. Probably now that this district is to be merged into the County Borough of Southend, all the sewage will be taken to the new works there, and the existing works at Leigh be abandoned. It would be a great advantage, as cockles are dealt with in the creek not far below the works.

SOUTHEND. The autumn of 1913 will probably see the opening of the new sewage works. The effluent will be discharged into the Thames estuary through a new outfall, the mouth of which will be one and a half miles below high water mark and 150 yards below low water mark. Hadleigh (in the Rochford Rural District) should be sewered and if this were done it might be possible to arrange with the Borough to receive and treat the sewage. This would be better and probably cheaper than providing another sewage disposal works. The conclusions arrived at by the Sewage Commission would seem to indicate that they would not require a high degree of purification as the sewage effluent from the new works will be discharged into more than 500 times its volume of water. It must, however, be of benefit to the Borough to produce an effluent which cannot by any possibility pollute the foreshore or affect the shellfish collected therefrom.

GRAYS. At length the sewerage of the riverside parishes of East and West Thurrock and Stifford in the Orsett Rural District is to be undertaken and the sewers of this area and of Grays and Tilbury will be under the control of a Joint Sewerage Board which has recently been formed. No doubt a comprehensive scheme will be formulated draining all these places either to the existing sewage works at Grays or to some centrally situated works. Certain houses in the lower part of Grays are liable to flood, but the Grays Council is taking steps to increase the capacity of the surface water drains to prevent a recurrence.

ORSETT R.D. New sewage works are being constructed at Stanford-le-Hope. The Mardyke, which flows through this district on its way to the Thames, often floods Bulphan and Orsett Fens, but the stream does not receive any appreciable amount of sewage.

THE RODEN OR RODING VALLEY.

ONGAR. A little pollution occurs in the more Rural part of this area, but Ongar town is sewered and the sewage is treated on land before it enters the river, and there is a sewage works at Abridge. High Ongar requires sewers and a scheme has been prepared and submitted to the Local Government Board, but it was found that the site for the disposal works did not meet with the Board's approval. There is some difficulty in obtaining a suitable plot of land. Blackmore is also receiving attention, but the want of fall and the heavy cost of up-to-date works have proved hitherto unsurmountable difficulties.

LOUGHTON. The town is well sewered and there is a very efficient system of bacterial purification.

Chigwell (Epping R.) The sewered portion of this parish drains to works near Buckhurst Hill and the sewage is treated on sprinkler beds before it enters the river.

Buckhurst Hill. The eastern area is drained to works on the banks of the Roding and is there treated bacteriologically and finally passed through 14 acres of porous land. The western portion is drained to the Woodford Western Works and the purified effluent enters the Lee.

Woodford. The greater part of this Urban area is in the Roding Valley. The existing sewage works are quite modern, but the bacterial treatment was on the "contact" system and the results were often not satisfactory. Two large sprinkler beds are being installed and no doubt a greatly improved effluent will result.

Wanstead. The Medical Officer of Health says: "The sewage farm, covering over 42 acres, originated about 30 years ago, and the present system, consisting of detritus and septic tanks, with the usual contact beds, as well as irrigation on land, has been in vogue for the last 11 years."

"With the growth of the locality, the system has been recognised as inadequate to meet future demands, and it has been necessary to decide on a more elaborate scheme."

"The proposed installation will consist of percolating filters and travelling distributors, and there will also be largely increased facilities for dealing with sludge. Arrangements have been made for completing the works in the spring."

THE ROM VALLEY.

The only works discharging into the Rom are the Romford and Hornchurch sewage works. The former is a well known sewage farm, whilst the latter consists of contact beds and land irrigation. Both are within the jurisdiction of the Port of London and appear to give very satisfactory results. Such samples as I have collected have usually been up to standard.

THE INGREBOURNE VALLEY.

This river is also a tributary of the Thames, but all the sewage works in it are outside the jurisdiction of the Port of London. The Brentwood, Shenfield, Great Warley, Brook Street (South Weald) and Rainham works all border on the Ingrebourne.

Brentwood. These works drain Brentwood and a portion of Shenfield and are controlled by a Joint Committee. They were reconstructed during the year and a new gravitation sewer of 21 inches diameter laid, and a new intercepting sewer provided. The sewage is treated twice on sprinkler beds and the works are of the most modern description. I was honoured by the Joint Board with an invitation to formally open the works and this I did after satisfying myself that they were producing perfectly satisfactory results. The engineers were Messrs. Willcox & Raikes.

A full description of the works was published in the *Surveyor and Municipal Engineer* for November 3rd, 1911.

The other works in this valley have given rise to no complaint, and when I have visited have usually been found in a satisfactory condition.

THE CROUCH VALLEY.

The only works in this valley are those of Billericay and Burnham.

The Billericay works are not yet completed. The Burnham works are on the bacterial system and discharge into the tidal river not far from the sea.

THE CHELMER VALLEY.

Many sewage works discharge effluents into the river and its tributaries.

In its upper reaches the Chelmer is polluted by the crude sewage from Thaxted Dunmow and Felstead. Next it receives an effluent from some small works at Great Waltham.

Then lower down sewer ditches at Little Waltham and Broomfield discharge into it, and it receives overflow from the Chelmsford Borough storm water sewers. The Chelmsford works drain into it below the town. The Witham sewage effluent discharges into the Blackwater before it joins the Chelmer, and sewer ditches at Kelvedon, Coggeshall, and Bocking pollute it. The Braintree sewage works discharge into another tributary, Pods Brook. Below where the Chelmer and Blackwater unite the river becomes tidal and it receives sewage from ditches at Heybridge, the sedimented sewage from Maldon, and near the mouth of the estuary the partially treated sewage of Tollesbury. Writtle and Ingatestone are both sewered and have proper disposal works, the effluent from which enters the Wid which after joining with the Cann flows into the Chelmer at Chelmsford.

This river has received a good deal of attention during the year, in consequence of complaints from Chelmsford Borough and it has been examined along its whole length on more than one occasion and a large number of analyses made. Notwithstanding the large amount of sewage and effluent it receives it is in a very good condition, the only places at which there is any evidence of pollution being just below Thaxted and Dunmow and below the Chelmsford sewage farm outfall.

The following are the reports of the Medical Officers of Health :—

Dunmow Rural. "In the parishes of Dunmow, Thaxted, Great Bardfield, Stebbing, Felstead, High Easter, Takeley, Hatfield Broad Oak, and Great Easton, road drains have been converted into sewers and, in a few instances, new sewers of glazed pipes jointed in cement have been added to meet present requirements. At Felstead ventilating shafts and two flushing tanks exist and the sewers are of better quality.

In all cases the outfalls of these sewers are into ditches and streams, that is to say, no disposal works intervene, and the Chelmer is much polluted at Thaxted and Dunmow. With the exception of Felstead, the other sewers do not pollute rivers to any great extent, though some pollution of the Pant undoubtedly takes place at Great Bardfield."

The Lee Conservancy allege pollution of the Pincey Brook at Hatfield Broad Oak."

The County Council had to threaten legal proceedings against the Council, whereupon schemes were prepared for sewering Dunmow and Thaxted. For some reason little progress appears to be made although one Local Government Board inquiry has been held. The delay is said to be in getting possession of suitable land for the disposal works.

Chelmsford Rural. The following is my report on the Chelmer in this district :—

"The various sewage works have acted satisfactorily during the year, but the coke beds at the Writtle works require to be renewed. The rivers have never been very low on account of the wet summer, and the only complaint received was about the condition of the River Chelmer at Chelmsford after a very heavy rainfall. Although the pollution was chiefly due to surface water from agricultural land, a careful inspection resulted in the discovery of several sources of pollution both in the Borough and Rural Districts. In the parishes above Chelmsford sewage enters the river from ditches at Broomfield and Little Waltham, and from several farms and private houses. Broomfield will be sewered shortly. Little Waltham is difficult to deal with, but the question of its drainage requires serious consideration. The pollutions from farms, &c., have either been remedied or are in the course of being remedied. The amount of sewage matter entering the river is very small in amount below Dunmow, hence by the time the Borough of Chelmsford is reached the natural processes of purification have rendered the water of as satisfactory a character as that of any stream in the County."

Chelmsford Borough. The Medical Officer of Health states that the existing sewers were laid for a population of 8,000 (50 years ago) and now have to serve a population of 18,000. They, therefore, cannot be adequate and the Council has the question of re-sewering before them, this says Dr. Newton "relieves me from any further comment." He thinks also that the farm is becoming too small to adequately treat all the sewage now flowing to it.

His report on the Chelmer is appended. The mistake made is in assuming that all the polluting matter entering this river after heavy rainfalls comes from sewers and sewer ditches. No reference is made to the effect of rainfall running off agricultural land.

"I have from time to time reported fully on the rivers in the immediate district of Chelmsford. This year I have nothing further to add to what I have previously

reported. That the rivers flowing through the Borough are very seriously polluted before they enter the Borough does not, in my opinion, admit of the slightest doubt. Last year I again submitted to your notice a full analysis of the water taken from the River Chelmer when it enters the Borough. That analysis proved beyond question how seriously this river is polluted. The attention of the County Council has, on more than occasion, been called to this seriously polluted condition of the river, but as far as I know nothing on their part has been done to remedy or improve this condition. I believe the Medical Officer of Health to the County Council has stated this pollution is, in his opinion, due chiefly to land drainage. In this matter, with all respect, I differ and think that if the Medical Officer to the County Council was not also acting as Medical Officer to the Rural District Council an improvement in the character of the water in this river would have been attained before this. The purity of this river is a matter of very great moment to the Borough and for this reason only I speak so strongly, at the same time with all due deference and respect. From this river, in spite of its impurities, the water for the Swimming Bath is still taken. This Swimming Bath I consider is of the greatest importance to the Borough and it would be nothing short of a calamity if, through the pollution of the river, the bath had to be closed, for unfortunately at present there is no alternative source from which water could be taken to supply the bath. I believe there is a scheme at present before the Rural District Council to provide a proper drainage system to Broomfield. I do not known if this scheme is to embrace Waltham also, but I hope it may do so. When this scheme is in being I believe a great improvement will be manifest in the purity of this river, that is of course, if the scheme is thorough and complete. In the meantime I suppose no improvement is to be expected and we in the Borough must continue to be endangered through the pollution of this river.

"In June last I again submitted the water taken from the Swimming Bath to Dr. Bernard Dyer for complete analysis. I append his full report, which, without further comment from me, speaks for itself and will I think also emphasize the remarks I have made on this subject."

[The analysis is not given here. Dr. Dyer's report on the result of his analysis is: "This water has the character of unfiltered river water, subject to pollution by *land drainage.*" The italics are mine.—J.C.T.]

Continuing, the Medical Officer of Health refers to sources of pollution in the Borough, some of which have been cut off, but he mentions others not yet dealt with. He does not, however, refer to the fact that quantities of solid faecal matter can be seen entering the river at certain points after any fairly heavy rainfall. This comes in from the storm overflows, especially near Springfield Mill.

When I was consulted by the Officials of the Royal Commission about a suitable place in Essex for certain experiments, I suggested the River Chelmer and the Chelmsford sewage works. My suggestion was acted upon and I now append their report thereon, taken from the Eighth Report of the Commissioners, Vol. 2:—

"Stream observations made at Chelmsford 1909-1912 on the River Chelmer:—

"*Population.*—16,000.

"*Sewerage System.*—Mainly combined.

"*Dry weather flow.*—500,000 gallons per 24 hours.

"*Nature of sewage.*—Strong domestic sewage containing brewery and tannery waste.

"*Treatment.*—Settling tanks followed by land irrigation and filtration. The soil is rather stiff.

Total tank capacity	...	137,000 gallons.
Total irrigable area	...	77,619 acres.

"*Effluent.*—This was an opalescent liquid with a brownish tint, and it contained, on an average, about $\frac{2}{5}$ parts of suspended matter per 100,000. It had sometimes a clean and sometimes an unpleasant smell. One sample out of the six putrified upon incubation.

	Parts per 100,000.
Ammoniacal Nitrogen ...	1·21
Nitric ,, ...	0·24
Oxygen absorbed by $\frac{N}{8}$ permanganate in 4 hours at 80°F. ...	1·34
Dissolved oxygen taken up from the water at 65°F.	
In 48 hours ...	0·49
In 5 days ...	1·22

"Two samples of land effluent, drawn in stormy weather, were examined in November and December, 1909. The first of these was putrescent on incubation and took up 4·4 parts of dissolved oxygen in 5 days. The second was non-putrescent and took up 2·8 parts. They contained 14 to 16 parts of suspended solids, of which two-thirds were mineral matter.

"*Nature of stream.*—Chelmer.

"*Velocity.*—The mean current velocity, as measured in dry weather over a distance of 1,400 yards below the outfall, was about 16 feet per minute. The flow is thus sluggish. The river is about 40 to 50 feet wide and 3 to 5 feet deep. Its rise in times of storm is gradual, the flood water being derived mainly from cultivated land. The dry weather flow of the river is 13,000,000 gallons hence the dilution of the effluent is about 26 to 1.

"*Effect of effluent discharge.*—Visits were paid in February, September and November, 1909, June, August and October, 1910, and January, May, June and July, 1911. The effluent is discharged into a very sluggish reach of river between two beds. It altered the appearance of the river very considerably ; the water was rendered turbid and of a dark colour : grey fungus was present for about a mile, and minute life was abundant.

Summary of Table of 10 series of analyses made between February 1st, 1909, and July 4th, 1911, both inclusive—

	River above outfall.	Sewage effluent.	River 300 yards below outfall.
Albuminoid nitrogen per 100,000—			
Highest ...	·04	·41	·07
Lowest ...	·02	·13	·03
Average ...	·03	·25	·045
Oxygen absorbed from $\frac{P}{80}$ in 4 hours at 80°F.—			
Highest ...	·42	2·05	·46
Lowest ...	·21	1·01	·28
Average ...	·28	1·36	·34
Oxygen in solution absorbed in 5 days—			
Highest ...	·47	4·53	·54
Lowest ...	·13	2·06	·25
Average ...	·23	3·05	·36

Analyses of Effluent only.

	Solid matter in suspension.	Oxygen absorbed from $\frac{P}{80}$ in 4 hours at 80°F.
Highest	6·9	2·77
Lowest	3·4	1·41
Average	5·1	2·17

"*Summary.*—1. This effluent, when diluted with about 26 times its own volume of moderately clean water moving in a sluggish current, did not give rise to any smell.

"2. The water was materially deoxygenated through admixture with the effluent.

"3. No deposit of offensive mud has been observed. There was about 2·5 parts of suspended matter in the effluent.

"4. A considerable quantity of grey fungus was present in the water below the outfall ; it extended for nearly a mile. Green algal growths were, in summer, plentiful below the outfall. The water swarmed with water insects and minute life.

"5. Coarse fish were present below the outfall."

The standard for ordinary effluents discharging into non-tidal rivers by the Commission is—

1, That the suspended matter should not exceed 3 parts per 100,000.

2. That the oxygen absorbed from solution in five days should not exceed 2 parts per 100,000.

In no single instance did the effluent from the Chelmsford Works come up to either of these requirements. The effect upon the stream as described by the Commissioners shews how a river is deteriorated by the influx of such an impure effluent.

The statements made in the opening paragraphs of the Royal Commissioners' Report are indeed remarkable. They say under the heading of "Effluent" that the average amount of suspended matter in the effluent is 2·5 parts per 100,000, yet the analyses given, 10 in number, shew that the effluent never contained less than 3·4, and that the average was 5·1. Then they give the results of an analysis which neither corresponds with any in the Table, nor is it an average of those in the Table. For example, the dissolved oxygen taken up in five days is given as 1·24, whereas in the Tables the lowest recorded is 2·06, the highest 4·53 and the average 3·05.

Impurity Figure. Under 10 represents an effluent of good quality, over 14 represents an unsatisfactory effluent—

Chelmsford Effluent on County Basis=21·95.
" on R.P.C. Basis=16·

The condition of the river above the Sewage Farm, as judged from the report, shews that it is in a very fair condition. After examining a number of rivers they classify them as under:—

Very clean	... ...	0·1 parts dissolved oxygen in 5 days.
Clean	... ...	0·2 " " "
Fairly clean	... ...	0·3 " " "
Doubtful	... ...	0·5 " " "
Bad	... ..	1·0 " " "

The Table of analyses shews that the river is generally clean and the average puts it in the class of "fairly clean." On no single occasion was it "bad" or even "doubtful." This is saying a good deal for an Essex river which has drained such a large extent of fertile land.

WITHAM. The sewage is disposed of upon 40 acres of arable land. The storm overflow at the works comes into operation too quickly, but I have not detected such pollution as would warrant any action on the part of the County Council. When I last met the Surveyor at the works he pointed out the difficulty of making any alterations, but I still think an improvement could be effected.

Braintree (R). The Medical Officer of Health makes no reference to Bocking or Coggeshall. At Kelvedon he says a modified drainage scheme is under construction. Both Bocking and Coggeshall, but especially the former, require the attention of the Rural District Council.

Braintree (U). There is no report from the Medical Officer of Health. The works here are modern, only having been in use about two years. A little difficulty was experienced at first in preventing humus from the bacteria beds getting into the river, but this has been overcome, I believe.

Maldon (R). The village of Heybridge drains into sewers which discharge into a tidal creek. There are very few w.c.s in the parish and improvements have been recently effected to prevent solid matters entering the stream. This is a case in which the Royal Commission suggest that discharge of partially purified sewage into a stream is permissible. At Tollesbury the sewage is "sedimented" and then filtered through coke. It has to traverse the saltings before reaching the Estuary and the oyster layings are far away.

Maldon Borough. 230 houses drain directly into the river, and the sewage from the remainder of the town flows into tanks from which it is discharged on the ebb tide into the Estuary.

THE COLNE VALLEY.

The Colne is polluted by sewer ditches at the Hedinghams and by effluent from a manufactory, and by sewage discharged directly into the river at Earls Colne. The Halstead works discharge into the river. Into the tidal portion is discharged sewage effluent from Colchester and Brightlingsea and sewage from Wyvenhoe and Rowhedge.

Halstead (R). "The river at Earls Colne is polluted by crude sewage." The outfalls and sewer ditches at the Hedinghams are cleaned out when necessary.

Halstead (U). The Dibden slate beds and filter scheme is completed. "Though the system has undoubtedly failed to give the almost perfect results that was hoped . . . yet it has effected much more satisfactory treatment than had been possible prior to its installation."

Lexden and Winstree (R). The old sewers at Rowhedge deliver directly into the Colne. The sewers at Abberton, Layer Breton and Great Tey all deliver into ditches. The Medical Officer of Health adds "For several years I have mentioned places that ought to be properly sewered but very little attention has been paid to them, so that I think I had better not state them in this report."

(The parishes referred to, no doubt, are West Mersea, Stanway and Rowhedge.)

THE STOUR VALLEY.

There is probably a little pollution from villages on the Essex side above where the river ceases to be tidal. The tidal portion receives the sewage of Manningtree and Mistley, and the sewage effluent from Dedham. The sewage here is treated on bacterial lines at modern works.

THE CAM VALLEY.

The river Cam receives the contents of sewer ditches from two or three parishes in the Saffron Walden Rural District and the sewage effluent from Saffron Walden Borough. It is noteworthy that the Cam, the Stort, and the Pant and the Chelmer all arise in the Saffron Walden Rural District.

Saffron Walden Borough. A modern system of sewage purification has just been completed and the river is no longer polluted. Sanction has been obtained to a loan of £2,500 for house connections to the new sewers.

THE LEE AND STORT VALLEY.

Stansted, many parishes in the Epping Rural District, Waltham Abbey, Chingford, part of Woodford, Walthamstow, and Leyton all have sewage disposal works in this valley.

Stansted. The Liernur system of sewers was adopted here and continues to work satisfactorily. The outfall works are on bacterial lines with sprinklers, &c., and give good results.

Epping Rural. This district has had to pay great attention to the sewering of many parishes on account of the strict supervision of the Stort and Lee by the Inspectors of the Metropolitan Water Board. Complaints having been followed up by legal proceedings and injunctions having been obtained and heavy fines paid, the Council has had to incur very heavy expenditure for the provision of sewers and sewage works, more especially as the Water Board require a very high degree of purification. I strongly suspect that the various suggestions as to standard, &c., recommended by the Royal Commission will not meet with the Board's approval.

At Roydon the sewage is treated bacteriologically and then filtered through sand. At Harlow the treatment is by broad irrigation of the screened sewage on nine acres of land. At Thornwood the sewage is passed through percolating filters and for this purpose pumping has to be resorted to. At the North Weald works the sewage is also dealt with on coke beds fed by sprinklers.

The sewerage of Netteswell Cross and Burnt Mill has been decided upon and plans prepared and the sewering of Sheering is being considered.

It is to be hoped that the increased prosperity and healthiness of this district will more than repay for the works executed.

Waltham Abbey, Chingford, and Woodford. These works are all satisfactory, and all are on modern lines.

Walthamstow. The Medical Officer of Health says no complaints have been received of nuisances, nor did any arise during the year at the sewage farm. After quoting a report of the Chairman of the Council he adds "His imperfect knowledge of the sewage farm and of the effluents produced accounts for his optimism." The arrangement made for taking the sewage into the Metropolitan sewers has

fallen through owing to the action of one of the constituent authorities. This is much to be regretted, but doubtless the project will be revived.

Leyton. The Medical Officer of Health says, "The Dagenham Brook and Waterworks River, the same stream being thus variously named at different parts of its course, is still considerably polluted by the sewage effluents of Leyton and Walthamstow." The present precipitation works are admittedly too small and additional tank accommodation is required. The Surveyor thinks these will be necessary even if the sewage is ultimately taken into the London County Council sewers. Many improvements in the sewerage system are recorded.

The above brief summary shows that both County Council and District Councils are paying great attention to the sewering of their respective areas and the preservation of the purity of our streams, or rather of improving their character, but it also shows that much more in this direction requires to be done, before the conditions generally can be said to be entirely satisfactory.

THE OYSTER FISHERIES.

Some of the world's most famous oysters are derived from the Essex estuaries, notably the Colchester Natives from the Colne. These oysters are "marketed" from the Pyefleet, a small almost land locked branch of the estuary nearly opposite Brightlingsea. The sources of pollution here are so remote that they do not affect the oysters. These have been examined at the County Laboratory on several occasions and found to be of the highest grade of purity.

At the mouth of the Blackwater are situated the layings of the Tollesbury and Mersea Oyster Fishery Co. The amount of sewage entering the estuary is infinitesimal and there is no source of pollution within miles of the beds from which the oysters are "marketed." I have also been all over these layings and examined the oysters with satisfactory results.

The Burnham oysters are taken from the Crouch estuary and the layings are far removed from the only possible source of pollution, the Burnham sewage works outfall.

There are many layings near Brightlingsea and up to Wivenhoe, and oysters and other shell fish are obtained from the above-named estuaries and from along the coast, often by unlicenced fishermen. Occasionally these are collected from places near sewer outfalls and their consumption has caused limited outbreaks of enteric fever. No such outbreak has occurred during the present year. It has been suggested that the collection of shell fish in certain localities should be forbidden, but unless there was an efficient staff of river watchmen any such regulation would be useless.

If such shell fish were only purchased from respectable dealers, there would be practically no risk. Nearly every outbreak which I have investigated has been due to shell fish bought from itinerant vendors, or from fish picked up by the affected persons themselves from the mud on the foreshores.

Unfortunately these outbreaks, however caused, affect the whole industry and the Companies who spare no efforts to supply wholesome oysters suffer more than those who are careless and whose carelessness is the cause of all the trouble.

HOUSING OF THE WORKING CLASSES.

In last year's report I gave the result of certain of my own investigations and pointed out the difficulties in arriving at reliable conclusions. There can be no question that throughout the whole of rural Essex and in many of the towns more and better cottages are urgently required. I am also glad to say that the Sanitary Authorities generally are beginning to recognise the need and when fully recognised I feel certain that a determined effort will be made to meet it. An enormous amount of work has been done throughout the county under the various Housing of the Working Classes Acts. Thousands of cottages have been reported upon and a large proportion have been adequately dealt with. It has surprised me on occasions to find how much could be done with old property which almost seemed beyond repair. Cottages are being better lighted, and better ventilated, and floors re-laid, spouting repaired, yards and paths paved so that they become reasonably dry and healthy. In many cases these repairs have been followed by an unreasonable increase in rent, but on the whole the improvements effected more than counterbalance the increased cost to the working man.

The appended Table is compiled from the returns asked for by the Local Government Board and furnished in most of the reports.

The Table (No. XXII.) shews that 8,895 cottages have been inspected under the Act, and that 393 or 4 % were found unfit for human habitation. The number of Closing Orders made was 113 and 43 houses were closed, and 26 were demolished either voluntarily or by order of the Sanitary Authorities.

So far as I can learn only 6 cottages have been erected by Sanitary Authorities in the County and these were provided by the Maldon Rural District Council in Tolleshunt D'Arcy. They had previously erected 6 in Bradwell. It is obvious that far more houses are being closed by the Authorities than they are providing, and that really nothing is being done to provide more cottages for the labourers in the Rural Districts. Several Councils are taking some steps and probably during the present year some few cottages will be provided in 2 or 3 districts but they will be very few indeed compared with the number required. This part of the Housing of the Working Classes Acts is almost a dead letter in the County.

The work done in the respective districts as reported by the Medical Officers is summarised below, and whenever an opinion is expressed as to the requirements of a district this is also given.

RURAL DISTRICTS.

Billericay. The Rural District Council is providing seven cottages in one block in Great Burstead and six, in pairs, in Ramsden Bellhouse. "These 13 cottages

TABLE XXII.

Particulars of Work Done under the Housing of the Working Classes Acts.

District.	Number of Dwelling Houses Inspected under Section 17 of Act of 1909.	Number of Dwelling Houses considered to be unfit for habitation	Number of representations made to the Council.	Number of Closing Orders made.	Number of Dwelling Houses the defects in which were remedied without Closing Orders.	Number of Dwelling Houses rendered fit for habitation after Closing Orders.	Number of Dwelling Houses closed.	Number of Dwelling Houses demolished by order of the Council.	Number of Dwelling Houses demolished by Owners
Belchamp	382	61	11	1	33	1	..	5	4
Billericay	100	18	14	2	84	0	..	..	6
Braintree	625	94	94	18	98	1	6	..	4
Bumpstead	69	6	1	1	32	..	..	..	..
Chelmsford	304	3	3	2	106	0	1	0	..
Dunmow	380	18	2	2	82	2	2	0	..
Epping	234	43	42	0	175	0	1	0	..
Halstead	1102	80	56	22	99	18	2	..	..
Lexden and Winstree	219	5	?	?	20	1	3	0	?
Maldon	1077	13	13	9	4	1	4	6	..
Ongar	253	6	6	6	51	2	4	..	..
Orsett	570	3	28	28	14	15	3	1	..
Rochford	500	8	3	8	205	?	8	?	..
Romford	2300	6	2	2	111	1	7	?	..
Saffron Walden	119	7	7	7	—	2	?	?	..
Stansted	300	6	6	0	6	0	2	..	..
Tendring	361	11	8	5	102	0	?	?	..
Totals	8895	393	296	113	1222	44	43	12	14

cannot be said to touch even the fringe of the problem of decently housing the working classes in this district."

Braintree. "The urgent need of more cottages becomes more insistent every year . . . it is to be hoped that . . . the local authorities will see their way to erecting cottages in those districts where the need is great." "Young people wishing to marry must either leave the district or wait until a cottage becomes vacant."

Chelmsford. Permission has been obtained to borrow the sum of £3,000 for the erection of 16 cottages in the parishes of Little Baddow, Danbury and Sandon. There will be two types each with three bedrooms, but one type will have scullery, kitchen and parlour, and the other scullery and living room only. The former are to let at 4/9 per week and the latter at 3/9. Should the results be satisfactory it is intended to build in other parishes.

Dunmow. No reference.

Epping. "The existing houses are too few in number, a large proportion are old, defective and worn out." Neither private enterprise nor the local authority is likely, so far as can be seen at present, to supply the deficiency.

Halstead. No reference to lack of cottages.

Lexden and Winstree. Houses are wanted in almost all the parishes in the district. The cottage inspection seems to be inadequate.

Maldon. The Rural District Council has provided six cottages in Bradwell and six in Tolleshunt D'Arcy and now proposes to erect another six in Tolleshunt Major. There were complaints of lack of cottages in Tollesbury, Little Totham and Woodham Walter. The D'Arcy cottages cost £1,145. Details of cost, rents, etc.' are given in the report.

Ongar. No reference to lack of cottages.

Orsett. The Medical Officer of Health thinks four new cottages are needed at Orsett and two at Langdon Hills.

Rochford. No special reference to want of cottages.

Romford. More cottages are required in Hornchurch, Upminster, Dagenham, Rainham and Wennington. The Rural District Council propose building some at Hornchurch and a Company proposes erecting 250 near Dagenham railway station. These will not meet the requirements of that section of the community who can only pay a very moderate rent.

Saffron Walden. There is a great want of cottages with three bedrooms in several parishes.

Tendring. Houses are very much needed in every parish. Four are to be erected in Little Oakley and after these are finished the Medical Officer of Health hopes to see many more erected.

There is very little doubt that the last Housing Act and the recent requirements of the Local Government Board has almost revolutionised the system of inspection in many rural districts. The perfunctory looking round for crying nuisances has given place to more or less careful house to house inspection. So many insanitary conditions have been discovered that some Councils have found it difficult to keep pace with the Inspector, and that official instead of being encouraged has been requested to hasten more slowly. It is useless discovering defects if no remedies are to be applied, and there is reason to think that inspectors are not, in all cases, being supported efficiently by their Authorities.

URBAN DISTRICTS.

BARKING. 286 houses have been completed during the year. A house-to-house inspection is in progress. There is no mention of any want of cottages, but the Medical Officer of Health thinks that use should be made of the Town Planning Act to regulate the arrangement of houses, &c.

BRENTWOOD. The housing is satisfactory, but five cases of overcrowding had to be dealt with.

CHELMSFORD. This Council is making a really serious effort to provide cottages for the workmen engaged at the various works in the Borough. There is a great demand for houses. The report of the Medical Officer of Health is as follows :—

"Last year I estimated the number of inhabited houses in the Borough to be 3,974, which, with a census population of 18,008, gave an average of 4·5 persons to each house. The Borough Surveyor informs me that completion certificates for 94 dwellings have been issued for the year ending December 31st, 1912, of these dwellings 66 could be termed Workmen's Cottages.

In addition to these the Corporation has completed the purchase of 6¼ acres of land off Rainsford Lane and 38 houses have been erected there. The accommodation provided is as follows :—

Class A. Seven houses, each containing parlour, living room, scullery, and three bedrooms, with bath provided. Rents 6/3 and 6/6 per week.

Class B. 15 houses, each containing living room, scullery, and three bedrooms. Rents, 5/3 and 5/6 per week.

Class C. 16 houses, each containing living room, scullery, and two bedrooms. Rents 4/3 and 4/6 per week.

The Borough Engineer is now preparing a scheme for the erection of over 100 more houses on the remainder of the site, with accommodation calculated to meet the requirements of the district. It will be seen, therefore, that 138 houses have been built and completed during the past year in the Borough : of these 104 can be called houses for the working classes. This increase in accommodation appears to be very definite yet the demand continues. Few, if any, cottages are vacant. This demand may, in my opinion, continue for some time. There must be to-day, in spite of the

number of cottages provided, a very large number of men employed at the various works who, with their families, have to live outside the Borough owing to the fact that cottages are not to be obtained. This condition also leads to serious overcrowding. It is quite common to find two families now living in one cottage. This state of things makes it very difficult for the Sanitary Authority to act properly when overcrowding arises as it frequently does. In time I suppose the question of supply and demand will balance itself and private enterprise will sooner or later, with Municipal buildings offer cottage accommodation sufficient for those engaged at work in the Borough."

Colchester. House inspection proceeds apace and great improvements are obviously being effected, but the Medical Officer of Health does not discuss the adequacy or otherwise of existing accommodation.

East Ham. The Council owns 220 artizans dwellings letting at 6s. 6d. and 7s. per week. No reference is made to any lack of cottages.

Epping. Not a single cottage has been erected during the year and 4 cottages have been closed. "Overcrowding is still frequently met with amongst the lower classes in the district, and is almost impossible to prevent so long as a scarcity of cottages continues. The usual result of taking action in these cases is that families are turned out of one cottage and immedialely proceed to overcrowd the next they remove to."

Grays. There is a large and increasing demand for cottages here which is not being met by private enterprise. A Town Planning Committee have plans under consideration for acquiring and laying out certain lands which when completed, will it is hoped, lead to an increased supply of houses.

Halstead. There is a good deal of unsatisfactory cottage property here. The Medical Officer of Health thinks some comprehensive scheme should be adopted dealing with the worst groups of buildings.

Harwich. The housing accommodation is very limited and restricts the value of the inspections being made. It is apparently expected that 84 cottages will shortly be erected on an estate at Dovercourt. A number of the worst cottages are about to be demolished.

Ilford. There is a supply of houses letting at 7s. 6d. per week and upwards, there are very few below this figure, and plenty of people in Ilford who cannot afford so much. The Council is considering the matter. It "is an economic problem of some complexity and magnitude."

Leigh. No special reference to housing is made in this year's report but it is a well known fact that certain areas require "clearing" and doubtless this will soon receive attention when the district is absorbed into Southend Borough.

Leyton. This district is now practically covered with houses, but the Medical Officer of Health does not complain of lack of accommodation.

LOUGHTON. The improvements recently effected in cottage property is most marked.

MALDON. The Borough Council prepared a scheme for erecting 15 houses and a Local Government Board enquiry was held. It was found that there would be a loss of £1 per annum on each house and the scheme has been abandoned for the present.

ROMFORD. A good deal of development is proceeding here and the housing generally is satisfactory.

SHOEBURYNESS. "There is a big demand for dwelling houses, as there are only 2 empty out of 902." Their general condition is good.

SOUTHEND. The housing question is fully discussed. There is a great demand but the Medical Officer of Health thinks "it is only the 'bad tenant' who has difficulty in obtaining accommodation." The Council owns 40 houses. The Accountant's Abstract of Accounts shews that the annual deficiency varies from £259 to £23. In the first year of occupation they showed a profit of £22. The capital charges relate to the whole of the land purchased yet only a part has been built upon. The rents are 7s. 5d. and 8s. 6d. per week.

TILBURY. There is a great scarcity of houses here and the Council is preparing a scheme for erecting a considerable number. Many existing houses are very damp, but improvements are being steadily effected. There is no doubt that a good deal of development will take place here and the new Council should endeavour to guide the development on right lines.

WALTHAMSTOW. There is an abundance of 5 and 6 roomed cottages letting at rentals of 7s. 6d. to 9s. and of flats of 3 and 4 rooms for 5s. 6d. to 6s. The houses generally are modern and convenient. The electric trams run to the extreme end of the district and in consequence new working class areas are springing up along the Chingford route, "and the older portions of the district tend to have a larger number of empty houses or less desirable class of tenant from the Eastern London Boroughs."

In the districts not referred to the Medical Officers make no complaint of any scarcity of cottages.

From my own observations I am of opinion that cottages are most urgently needed in the neighbourhood of Grays and Tilbury and that they are not likely to be provided save by the Urban Councils.

The general character of the defects reported by Inspectors may be arranged in the following order of frequency :—

1. General dilapidations due to neglect of owners to execute necessary repairs.

2. Dampness of walls and floors due to imperfect foundations, defective spouting, and lack of spouting.

3. Insufficient ventilation and lighting due to small window area and the windows not being made to open properly.
4. Want of or defective paving at back of house.
5. Drainage defects, and water closets without water laid on.
6. Bedrooms without fireplaces or lack of through ventilation.
7. Want of proper receptacle for house refuse.
8. Defective privies or privies too near houses.
9. Unsatisfactory water supplies.
10. Overcrowding.

Naturally one class of defect may prevail more in one area than another. If urban areas alone were being considered then No. 5, drainage defects, would stand much higher in the list. Probably it should be higher than given here if more care and time were given to the examination of the underground portion of the drainage arrangements.

MIDWIVES ACT, 1902.

During 1912, 353 women were entered on the roll of Essex midwives, but of these 69 left the County or gave up practice during the year, leaving 284 on the roll at the end of the year, which is exactly the same number as at the end of 1911.

The proportion of trained to untrained midwives is also about the same as last year. The Nursing Associations were employing 84 women, and 46 of the women on the register in 1912 were really maternity nurses and took no cases of midwifery without a medical man.

The formal notices received during the year were as under :—

Records of sending for medical help	438
Still births	109
Death of mother	1
Deaths of children	13
Preparing bodies for burial	15
Total	576

The number of cases of puerperal fever notified in the County was 72 and of these 31 were among women attended by midwives. This is a far larger proportion than last year, and is unfortunately due chiefly to a large number of cases among women attended by nurses from two large Nursing Homes in the Metropolitan area. One series arose from a case diagnosed as pnuemonia, but which proved to be puerperal fever. The patient had been visited by several nurses, who had thereby spread infection to other women being attended about the same time. Several cases of

fever also occurred in the practise of one midwife, although neither we nor the medical man at the place could find that she was in any way to blame. She used every possible precaution and was deeply distressed at the cases occurring in her practice.

The total number of births in the County was 23,562 and the number attended by midwives 6,877 or 29 per cent.

Practically every midwife in the County was visited during the year and those who required it were visited on several occasions. We have many District Nurses and well trained Midwives in the County who may be trusted to report anything unusual at once.

Nurse —— of Southend was reported for negligence in her work and for not keeping the rules of the C.M.B. We reported her to the Board and she was called before them and severely censured. We were asked to look after her and report quarterly to the Board, but she has continued satisfactory since then.

Midwife —— of Halstead was reported by a doctor for carelessness and for neglecting a patient who had fits. We made careful enquiries and found that the midwife had done what she thought right and only left the patient when she considered that the case was taken over by the doctor.

Midwife —— of Southend was also severely censured as she had several infants with inflamed eyes and had neglected to call medical aid at once.

Several midwives complain bitterly that medical men will not help them when summoned in emergencies. This has been responsible for several deaths due to delay in getting medical help.

Four women in the Metropolitan area were specially visited owing to reports received of dirty houses, etc., one woman was severely warned about the dirty state of her house and her person, and all are kept under observation.

Many enquiries were answered and minor complaints investigated.

Mrs. —— of Barking was prosecuted in January, 1912, for practising without a certificate. She pleaded guilty and was bound over for a year under penalty of £5.

One woman at Colchester was constantly reported for taking cases without being a certified midwife. She has been repeatedly warned and steps are being taken towards prosecuting her.

A number of women were warned, in consequence of complaints received, that they must not practice without the C.M.B. certificate. The majority of these complaints were found on investigation to be groundless; usually it was proved that the women had only acted in cases of "emergency."

The women conducting the practice of midwifery illegally are undoubtedly getting fewer in number, but occasionally a woman is found to be practising and no one reports her because she is useful and popular in the neighbourhood and much preferred by her poor neighbours to a doctor or a well trained and qualified midwife.

SALE OF FOOD AND DRUGS ACT.*

Summary Report on samples analysed during the twelve months ending 30th November, 1912.

During the twelve months ending on 30th November, 1912, 2,517 samples were submitted to the Public Analyst for the County under the Sale of Food and Drugs Act. Of these 130, or just under 5¼ per cent., were adulterated or deficient as compared with legal requirements.

The samples are summarised in the following tables:—

	Samples Analysed.	Samples Adulterated.	Percentage of Adulteration, 1910-11.
Northern District of the County ...	518	12	2·1
Southern District of the County ...	679	52	7·7
Metropolitan Police District of the County	1,155	53	4·6
Chingford Urban District Council ...	8	1	
Clacton Urban District Council ...	6	5	
Romford Union Guardians	3	1	
Southend Corporation	2	—	
Walthamstow Urban District Council ...	126	6	7·9
Wanstead Urban District Council ...	12	—	
Woodford Urban District Council ...	6	—	
Private Purchasers	2	—	
	2,517	130	5·2

	Analysed. Samples.	Adulterated. Samples.
Arrowroot	5	—
Butter	899	31
Butter, Milk-blended	9	—
Cheese	66	—
Cocoa	12	—
Coffee	26	1
Coffee and Chicory	4	—
Corn Flour	2	—
Cream	1	—
Cream, Preserved	1	—
Custard Powder	1	—
Drugs:—		
Camphorated Oil	5	—
Chloride of Lime	6	4
Cream of Tartar	1	—
Epsom Salts	3	—
Paregoric	1	—
Paregoric Substitute	1	—

*This Report has been kindly supplied to me by Dr. Dyer, the Public Analyst for the County.

	Analysed Samples.	Adulterated Samples.
Golden Syrup	1 ...	—
Jam	16 ...	2
Lard	133 ...	—
Margarine	65 ...	1
Marmalade	1 ...	—
Milk	1,154 ...	91
Milk and Water	1 ...	—
Milk, Skimmed and Separated	16 ...	—
Milk, Condensed	26 ...	—
Mustard	2 ...	—
Oats, Rolled	1 ...	—
Olive Oil	2 ...	—
Pepper	34 ...	—
Rice	1 ...	—
Sausages	9 ...	—
Sugar	3 ...	
Tapioca	1 ...	—
Tea	3 ...	—
Vinegar	3 ...	—
Beer	2 ...	—
	2,517	130

Of the samples supplied as butter, 16 consisted of ordinary margarine, containing not more than the small proportion of butter fat allowed by law. Nine samples were mixtures of butter and margarine, containing foreign fat in proportions ranging from 7 per cent. to 50 per cent. Three samples of butter, otherwise genuine, contained boracic preservative in excess of the limit of 0·5 per cent. suggested in 1901 by the Departmental Committee of the Local Government Board on Food Preservatives, the proportions of boracic preservative being respectively 0·75 per cent., 0·9 per cent., and 1·0 per cent. Boracic preservative was found in a large number of other cases, namely, in about 400 of the samples of butter and margarine examined, but with the exception of the cases mentioned the proportions did not exceed the limit of 0·5 per cent., and was in most cases considerably less. Three other samples of butter contained excessive quantities of water, namely, 20 per cent., 23 per cent., and 23 per cent. respectively, the legal limit being 16 per cent.; but in one of these cases the sample, although supplied in response to a demand for butter, was wrapped in paper on which was printed a declaration of the presence of the excess of water.

A sample purchased as coffee was found to contain an admixture of ground white sugar. The shop-keeper explained that he inadvertently emptied some sugar into a drawer containing the coffee, and that the mixture was unwittingly sold during his absence.

Of the 6 samples of chloride of lime (or chlorinated lime) 4 were unsatisfactory by reason of deficiency in available chlorine, the active constituent of this material. The samples were purchased in consequence of a suggestion made by the County Medical Officer of Health. In the first place, 4 "informal" samples were purchased at various shops. Of these, two were satisfactory, containing approximately the proper quantity of available chlorine, while two were unsatisfactory, one being of only half the proper strength and the other of only about one-fifth of the proper strength. "Formal" samples of these two makes were then purchased, and were found to contain not more than 15 per cent and 4½ per cent. respectively of available chlorine, whereas the proper quantity as prescribed in the British Pharmacopoeia is 33 per cent. of available chlorine.

A sample purchased as raspberry jam consisted of jam made from a mixture of raspberries, gooseberries and apples. In this case the Inspector noticed that the jar from which the sample was taken bore a printed label, "Raspberry Flavoured Jam."

Another sample purchased as raspberry jam contained at least 10 per cent. of apple pulp without any declaration being made as to its presence.

One sample of margarine contained 40 per cent. of butter fat. The proportion of butter fat which the law allows in margarine is only 10 per cent.

Forty-one samples of milk contained added water, the proportions being :—

In 28 cases 10 per cent. or less
In 8 cases from 11 per cent. to 15 per cent.
In 1 case 22 per cent.
In 1 case 24 per cent.
In 1 case 27 per cent.
In 1 case 29 per cent.
In 1 case 38 per cent.

These samples included one which was partially skimmed as well as watered.

Fifty other samples were deficient in fat, the deficiencies (stated as percentages of the minimum normal quantity laid down in the statutory regulations of the Board of Agriculture) being :—

In 22 cases from 5 per cent. to 10 per cent.
In 12 cases from 11 per cent. to 15 per cent.
In 5 cases 16 per cent.
In 5 cases 20 per cent.
In 1 case 23 per cent.
In 1 case 26 per cent.
In 3 cases 30 per cent.
In 1 case 36 per cent.

BERNARD DYER.

COUNTY PUBLIC HEALTH LABORATORY.

The work done in these laboratories is entirely different from that undertaken by the Public Analyst. Foods may occasionally be examined but it is not to ascertain if they are adulterated or of inferior quality but to ascertain whether they are capable of causing disease. Water is specially excluded from the Food and Drugs Act, and is therefore examined in the laboratories, to ascertain whether it is free from objectionable constituents and is pure and wholesome. Sewage effluents are examined to ascertain whether the works are acting efficiently and river waters are examined to determine to what extent they are affected by polluting matters carried into them.

The larger number of examinations made are bacteriological and usually of a diagnostic character, that is to ascertain whether a person is suffering from a certain disease or not. Disinfectants are examined to ascertain whether they are up to a guaranteed standard, or whether they are stronger, and how much stronger, than pure carbolic acid. When outbreaks of Typhoid Fever or of food poisoning occur articles of food and drink, water, milk, shellfish, sausages, &c., &c., may require both chemical and bacteriological examination. When Diphtheria occurs bacteriological examinations are made from the throats of contacts to ascertain whether infected or not, and before being discharged from hospital the throats of the patients are examined to determine when it is safe to discharge them.

In cases of Pulmonary Tuberculosis the examination of the sputum of the patient is important, as showing the extent of the disease, the effect of treatment, &c. In fact, recent progress in Sanitary Science has rendered it necessary that Sanitary Authorities should either possess well equipped laboratories or have an arrangement with the principal of such a laboratory for making the numerous Bacteriological, Microscopical, and Chemical investigations required by Medical Officers of Health or the medical men practising in their districts.

Save in very large districts the cost of maintenance of such a laboratory is too great to be within the bounds of practicability. For this reason many County Councils, of which Essex was one of the first, provided laboratories for the use of the various Urban and Rural Districts in their areas.

Such examinations as are referred to above require not only special apparatus and appliances such as few Medical Officers of Health or medical practitioners possess, but the investigations often require a considerable amount of time. For these reasons it is rarely possible for the Medical Officer of Health to undertake such examinations unless provided with a laboratory and assistants.

In the County Laboratory the whole of the work is done by skilled assistants under the supervision of the County Medical Officer of Health, who holds himself responsible for the accuracy of the results, and who is often able to tender valuable advice as the result of the investigations. The laboratory at Chelmsford was equipped by the County Medical Officer, was approved by the County Sanitary Authority, and the scale of fees was fixed sufficiently low to encourage local authorities to avail

themselves of the advantages offered. Many authorities and many private practitioners have so availed themselves and about 2,500 examinations were made last year.

SUMMARY OF WORK DONE IN THE PUBLIC HEALTH LABORATORIES, 1912.

Chemicdl Department—

Potable waters examined	...	...	265
Effluents and river waters	...	...	65
			330

Bacteriological and Microscopical Department—

Diphtheria diagnosis	...	...	...	1501
Enteric Fever	,, ...	...	...	84
Ringworm	,, ...	...	...	205
Tuberculosis	,, ...	...	...	308
Potable waters examined		...	...	79
Sundries ...	...	...	...	65
Total	...	...	.	2242

Total number of examinations, 2,572

During the year many samples of milk were examined to ascertain whether there was any simple process by which the cleanliness could be determined. I find that a modification of an American process gives the best results. This consists in filtering one quart of milk heated to 40° C through a cotton wool disc 1in. in diameter. The dirt is left on the surface of the disc.

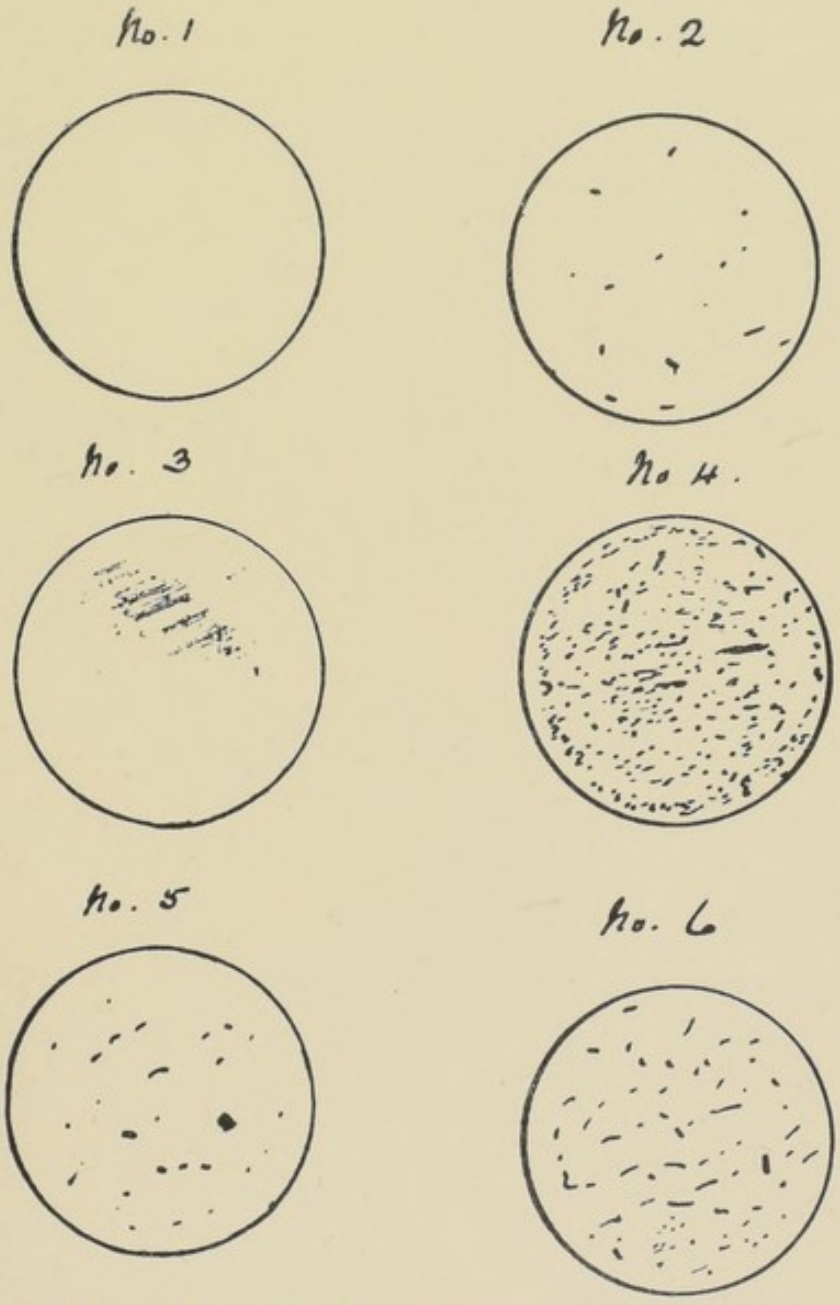
The great differences found are illustrated in Fig. 1, where No. 1 shews a disc after milk of excellent quality and perfect cleanliness has been passed through it. No. 4 shews a disc through which dirty milk has been passed. All the samples of milk examined were purchased from milkshops or dairymen. Sample No. 3 shewed very few specks but the wool was covered with a grey slimy material, and when the disc was dried the portion shaded had a marked brown tint. I caused the cows at this farm to be examined and it was found that two or three were suffering from inflammation of the udder. I certainly do not regard such milk as wholesome.

Figures 2 to 8 shew the nature of the sedimentary matter found in milk. This sediment is seen to consist of bacteria and moulds, and vegetable débris resulting from the incomplete digestion of the vegetable matter on which cows are fed, and corresponding exactly with what is found in cow manure. There can be no doubt but that most of the debris is derived from this source, hence the danger attendant upon the use of such contaminated milk.

If time and opportunity permitted I should like to have examined in the Laboratory a series of samples of milk from different districts. This simple examination, if followed up by visits to the dairymen and milksellers supplying dirty milk, wonld soon lead to more care being taken to supply clean milk. This I can affirm from the practical experience gained during the few months when this investigation was being conducted. Unfortunately the sudden pressure of work due to the Tuberculosis sections of the Insurance Act caused further examinations to be abandoned. Any Medical Officer of Health, however, could easily fit up the simple apparatus required and examine the milk in his district and I would suggest that this should be done.

FIG. 1.

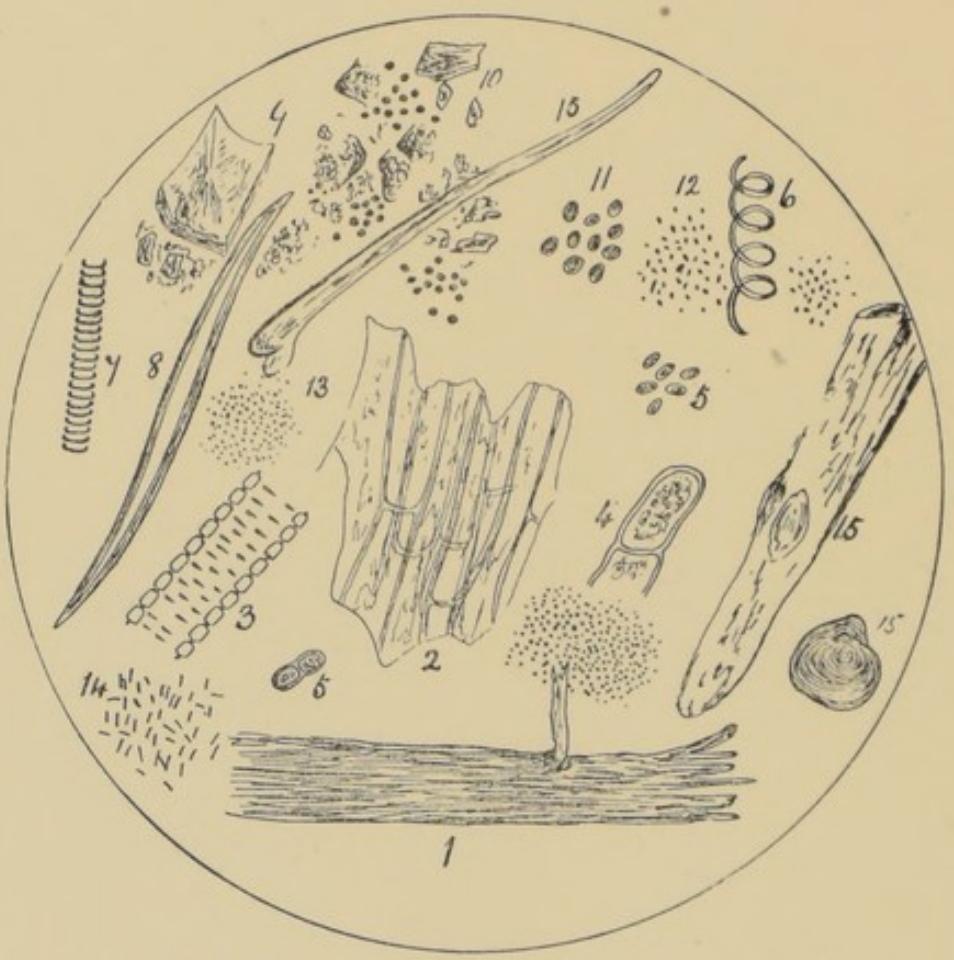
DEPOSITS OBTAINED UPON 1IN. FILTERS FROM 1 QUART OF MILK.



1. No deposit. A clean milk
2. A fairly clean milk.
3. Slimy deposit. Cows found to be suffering from Mastitis.
5, 6. Deposits from milk of doubtful cleanliness.
4. Deposit from a " dirty " milk.

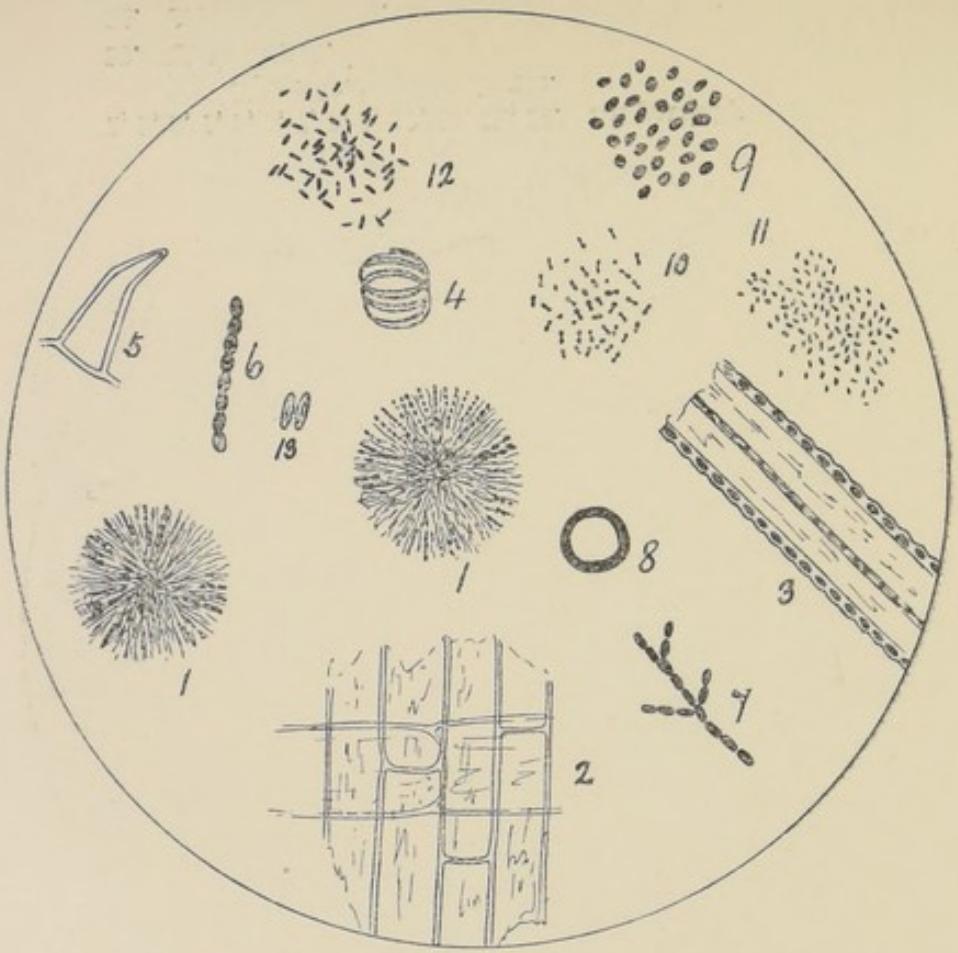
FIG. 2.

MICROSCOPIC APPEARANCE OF DEPOSITS FOUND IN MILK.



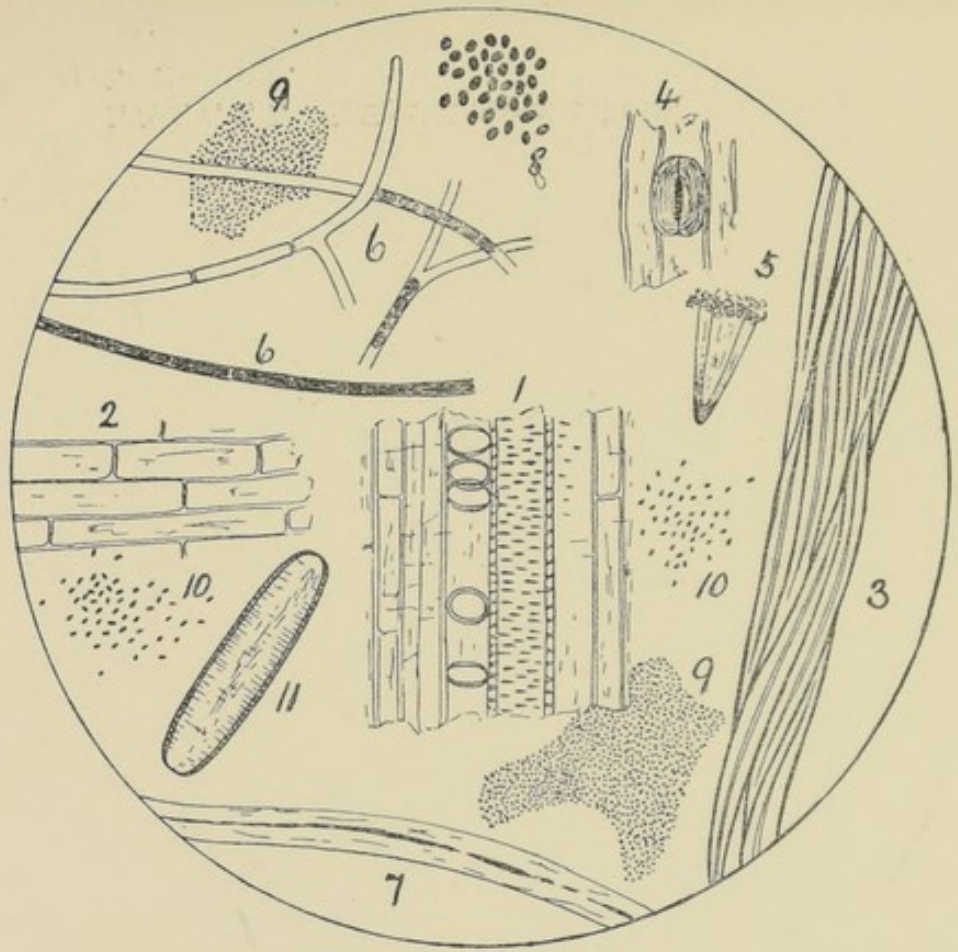
1. Fibre of Hemp.
2. Disorganised fragment of cortical cells.
3. A pitted vessel in wood.
4. Cortical or pith cells.
5. Mould spores.
6. Spiral thickening from a vascular bundle.
7. Rings from an annular vessel, vascular bundle.
8. A wood fibre (parenchyma).
9. Dust and debris.
10. Large micrococci in 9.
11. Possibly fat globules.
12. Short baccilli, plentiful.
13. Micrococci, very plentiful.
14. Longer baccilli, fairly plentiful.
15. Unidentified, probably a starch granule.

FIG. 3.



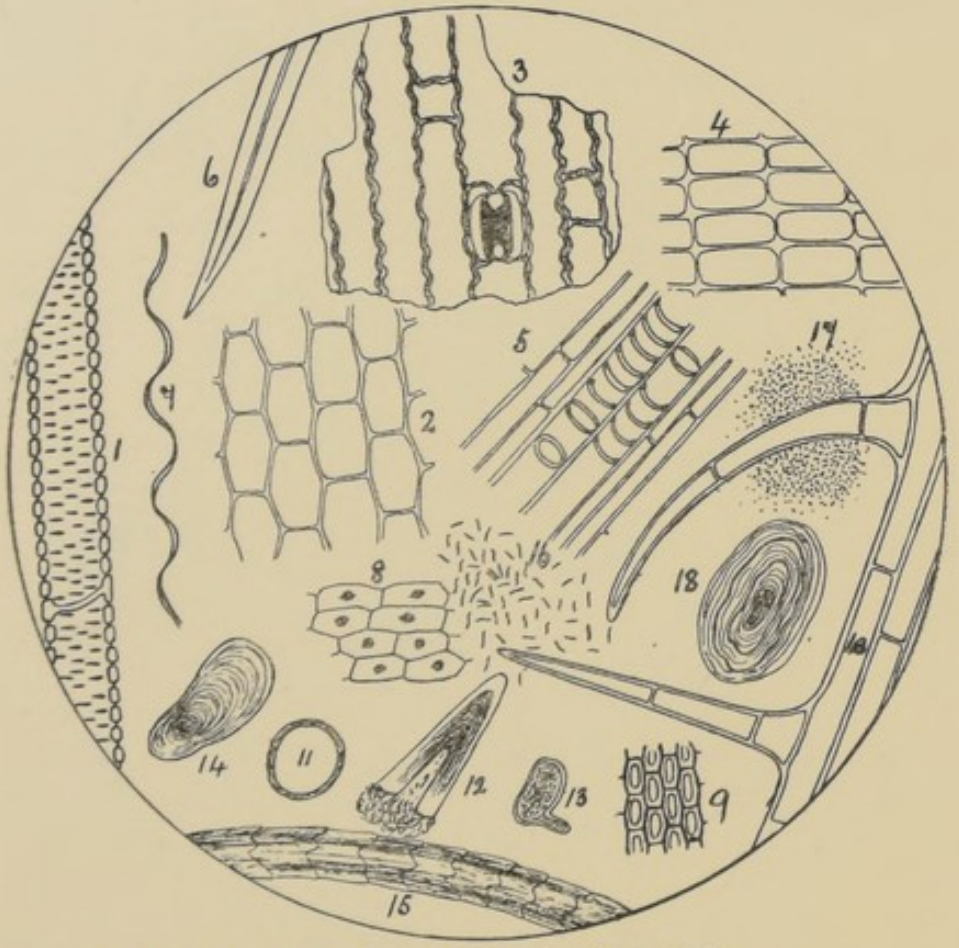
1. Moulds.
2, 3, 4, 7, 8. Vegetable tissues which have escaped digestion.
6, 7. Torwla cells (Yeasts).
9, 10, 11, 12. Various kinds of bacteria.

FIG. 4.



1, 2, 3, 4, 5, 7. Partially digested vegetable tissues.
6. Algal threads. Found in pond waters.
8, 9, 10. Various kinds of bacteria.
11. Desmid. Found in pond waters.

FIG. 5.



1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 18. All partially digested vegetable tissues.

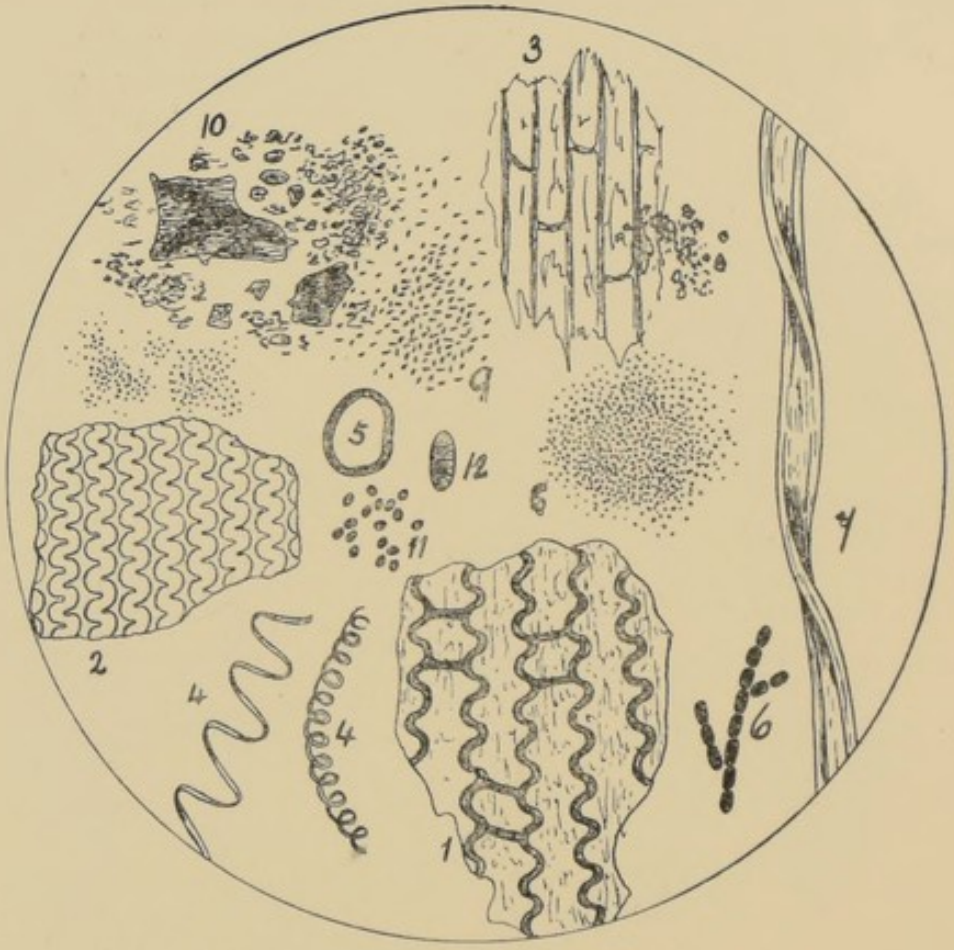
13. Unidentified.

14. A starch granule.

15. Hair of animal,

16, 17. Bacteria.

FIG. 6.



1, 2, 3, 4, 5, 7. Undigested vegetable tissues.

6. Yeast cells.

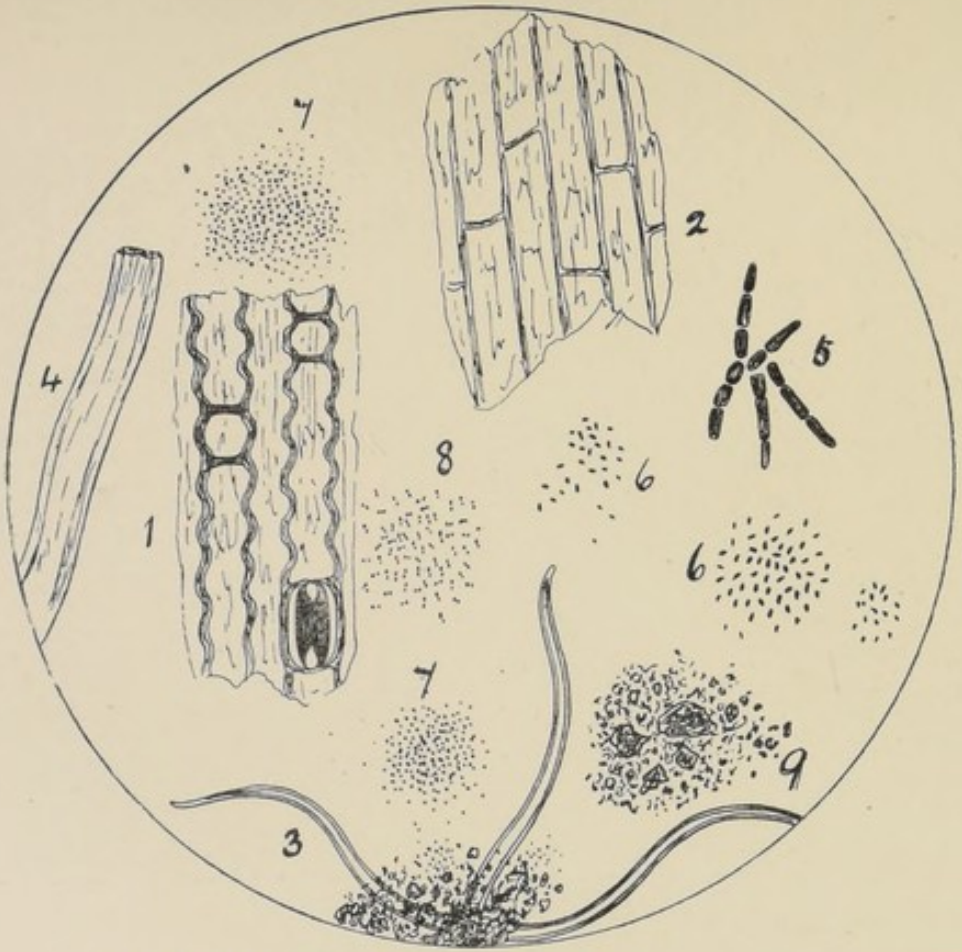
8, 9. Bacteria.

10. Sandy matter.

11. Spores of mould.

12. ?

FIG. 7.



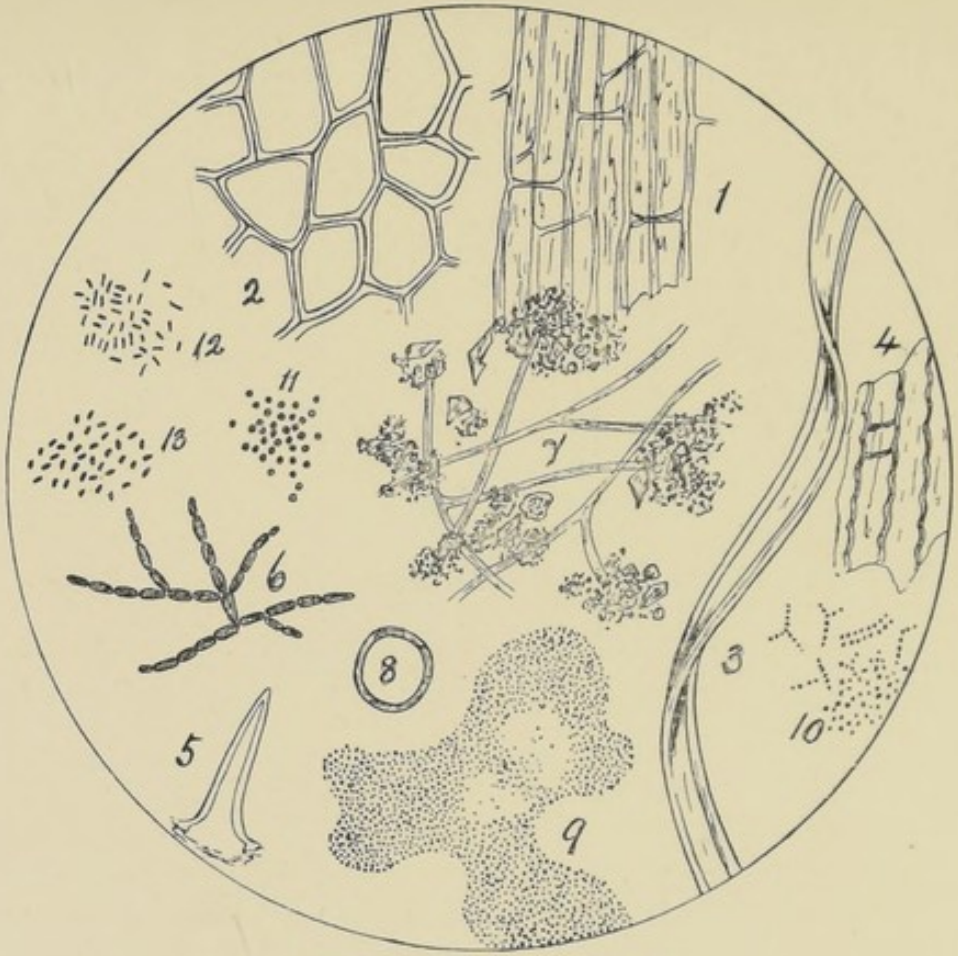
1, 2, 3, 4. Undigested vegetable matter.

5. Probably torula.

6, 7, 8. Bacteria, various kinds.

9. Dirt of mineral origin.

FIG. 8.



1, 2, 3, 4, 5, 8. Fragments of vegetable tissue.

6. Torula.

7. Fungal threads and dirt.

9, 10, 11, 12. Various kinds of bacteria.

TABLE XXIII.

URBAN DISTRICTS.

SUMMARY OF REPORTS BY SANITARY INSPECTORS.

		Barking.	Braintree.	Brentwood	Brightlingsea.	Buckhurst Hill.	Burnham.	Chelmsford.	Chingford.	Clacton.	Colchester.	East Ham	Epping.	Frinton.	Grays.	Halstead.	Harwich.	Ilford.	Leigh-on-Sea.	Leyton.	Loughton.	Maldon.	Romford.	Saffron Walden	Shoeburyness.	Southend-on-Sea.	Tilbury.	Waltham Holy-Cross.	Walthamstow.	Walton-on-the-Naze.	Wanstead.	Witham	Wivenhoe.	Woodford.
1	Complaints received ...	113	7	25	7	15	14	113	25	17	569	984	25	27	73	22	22	265	100	335	3	15	32	33	87	681		31	225	5	115	10	4	45
2.	Nuisances detected without complaint ...	3567	204	904	40	16	17	993	238	139	227	5518	84	8	373	168	...	938	75	2773	19	279	357	671	51	1063		534	4278	37	150	3	20	577
3.	Nuisances abated ...	3288	162	802	40	31	28	651	253	149	1076	6520	94	9	440	163	50	829	94	3108	21	293	384	695	129	1454		541	4526	42	200	12	24	599
4.	Nuisances remaining unabated ...	279	42	158	7	2	3	42	10	5	9	456	15	..	6	5	1	109	6	...	1	1	17	9	9	43		203	23	0	45	1	1	257
5.	Formal notices served	374	18	146	40	...	4	16	14	130	102	2457	...	2	126	30	52	857	150	3614	53	136	401	104	39	928		1	27	18	41	1	2	...
6.	Summonses issued ...	...	...	2	...	...	3	1	3	2	...	11	...	..	...	...	...	4	...	1	...	...	5	...	..	10		..	...	...	1	...	...	...
7.	Convictions obtained...	...	...	2	...	...	2	1	3	2	...	11	...	...	...	...	...	3	...	(*j*)	...	...	5	...	...	10		...	...	...	1	...	...	...
8.	No. of cottages inspected	4204	425	547	325	103	276	1136	289	457	3495	3434	85	32	1230	420	..	3132	...	3846	59	168	429	340	216	4471		260	5715	247	66	...	500	1231
9.	No. of cottages found unfit for human habitation	36	1	4	2	1	13	59	...	1	13	...	48	...	...	4	19	...	...	10	1	18	8	2	...	3		4	1	7	15	...	2	2
10.	No. of representations made with the view of Closing Orders being made	19	1	4	2	...	3	8	...	1	13	...	3	...	...	1	9	...	...	10	...	8	...	2	...	...	No Report.	3	...	...	15	...	1	2
11.	No. of Closing Orders made	13	1	...	2	1	...	4	...	1	13	...	3	...	...	1	9	...	...	10	1	6	...	2	...	...		2	...	...	6	...	1	2
12.	No. of cottages in which defects were remedied without a Closing Order ...	...	70	147	...	...	7	51	...	...	20	3434	30	...	82	...	...	68	...	...	1	10	287	38	...	1156		142	2382	...	38	...	...	169
13.	No. of cottages in which defects were remedied after making Closing Order ...	13	1	...	...	1	...	...	150	...	2	...	...	...	...	4	1	...	...	10	...	3	...	...	...	...		...	...	...	...	...	...	...
14.	No. of cottages closed	...	...	...	2	...	...	3	...	...	13	...	4	...	...	...	22	...	...	...	1	2	2	2	...	...		19	1	7	...	...	2	2
15.	No. of cottages demolished by Order	4	...	...	...	...	...	...	...	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	•		...	...	...	...	...	...	...
16.	No. of Common Lodging Houses in District.	5	...	2	...	...	...	2	..	...	...	1	...	...	3	...	...	...	...	...	...	...	2	...	...	1		...	...	...	..	...	...	...
	Frequency of Inspection	102	...	(*d*)	...	...	...	46	...	...	90	14	...	...	(*c*)	...	...	..	..	...	...	1	8	...	...	14		...	...	...	...	...	...	...
17.	No. of Slaughter Houses in District	3	7	8	5	2	4	9	3	4	...	15	5	...	5	10	...	3	2	17	3	...	10	5	1	8		4	13	...	2	4	1	6
	Frequency of Inspection	334	(*f*)	(*c*)	15	25	(*d*)	140	(*a*)	..	452	144	270	..	(*a*)	(*d*)	..	(*a*)	200	957	36	4	107	(*d*)	(*a*)	306		137	329	8	85	(*d*)	12	27

18. No. of Bakehouses in District	16	9	9	13	5	6	17	3	...	...
Frequency of Inspection	44	(f)	(d)	26	61	(f)	101	(d)	11	144
19. No. of Dairies and Milkshops	45	6	3	17	3	5	17	16	...	...
Frequency of Inspection	274	(f)	(c)	...	81	(d)	89	(e)	23	144
20. No. of Cowkeepers ...	2	5	...	7	2	4	9	11	...	...
Frequency of Inspection	27	(f)	...	...	31	(d)	79	(e)	6	65
21. No. of samples of milk taken for examination for cleanliness, etc. ...	...	...	...	...	...	...	...	6	48	...
22. Filthy houses cleansed.	...	1	6	...	...		23	11	...	38
23. Houses disinfected ...	264	11	23	5	10	11	110	54	81	130
24. Cases of Overcrowding abated	28	...	5	...	1	...	8	12	...	14
25. New houses. No. of water certificates applied for... ...	...	...	8	8	6	3	...	...	...	...
26. No. of certificates granted	...	...	8	8	6	3	...	..	...	...
27. Public wells sunk	...	...	..	...	...	...	...	...	...	...
28. Privies. No. in district	...	No complete return available.	1	18	...	3	(h)	2	...	...
No. abolished during the year	...		2	1	...	...	Nil	1	4	3
29. No. of pail closets ...	...		2	25	...	30	(h)	...	...	1
30. No. of W.Cs. with proper flushing arrangements	...		1236	457	...	400	(h)	...	..	483
31. No. of hand-flushed W.Cs.	...		362	602	...	200	(h)	...	..	127
32. Animals improperly kept removed ...	17	...	11	...	..	1	52	5	3	82
33. Samples of water taken for analysis ...	...	2	...	...	...	0	...	...	16	1
34. Compensation paid for bedding, clothing, etc., destroyed	...	...	...	£5/10	...	...	...	...	...	0
35. Seizures of unsound meat, etc. ...	...	...	...	...	...	1	3	1	...	12
36. Name of Inspector ...	H. Wood	H. H. Nankivell	A. J. Meeson	H. V. Lord	J. T. Heath	Chas. Weedon	W. Brown	W. R. Wilkins	A. W. Shadick	Thos. Wells

18. No. of Bakehouses in District	50	5	2	10	14	...	32	9	45	4	..	15	13	6	45
Frequency of Inspection	142	40	(d)	(d)	(d)	...	(d)	12	193	49	9	37	(f)	(e)	362
19. No. of Dairies and Milkshops	151	4	3	37	6	...	51	21	154	2	...	24	18	6	39
Frequency of Inspection	409	48	(d)	(d)	(d)	...	(c)	100	652	28	11	81	(d)	(b)	278
20. No. of Cowkeepers ...	9	3	1	1	3	...	14	3	6	7	...	13	18	3	6
Frequency of Inspection	70	36	(d)	(d)	(d)	...	(d)	30	50	84	...	47	(d)	(b)	46
21. No. of samples of milk taken for examination for cleanliness, etc. ...	...	...	(i)	...	...	...	1	..	...	...	8	...	...	17	..
22. Filthy houses cleansed.	...	2	...	11	...	3	6	10	1282	...	...	2	1	9	13
23. Houses disinfected ...	1020	...	3	65	11	38	496	35	729	9	5	98	36	37	368
24. Cases of Overcrowding abated	19	2	...	10	6	3	9	...	12	2	2	2	1	3	24
25. New houses. No. of water certificates applied for... ...	...	2	...	12	9	...	...	108	...	20	12	...	8	23	...
26. No. of certificates granted	..	2	...	12	9	...	...	108	...	20	12	...	8	23	...
27. Public wells sunk	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
28. Privies. No. in district	...	...	...	...	10	...	97	...	...	...	...	58	175	16	...
No. abolished during the year	...	...	...	...	...	27	6	...	...	4	23	...	328	...	...
29. No. of pail closets ...	...	...	1	...	11	...	71	...	59	1	4	99	19	...	...
30. No. of W.Cs. with proper flushing arrangements	27000	10	(g)	3133	...	...	...	15	...	22	98	2552	1294	(g)	...
31. No. of hand-flushed W.Cs.	...	103	...	...	...	...	...	...	...	...	1300	1253	247	...	...
32. Animals improperly kept removed ...	25	1	1	12	1	1	8	8	55	...	...	2	...	2	148
33. Samples of water taken for analysis ...	...	..	...	4	...	1	2	...	...	...	...	5	...	1	18
34. Compensation paid for bedding, clothing, etc., destroyed	£2	...	...	1	...	1	£1	...	...	...	...	...	...	...	Nil
35. Seizures of unsound meat, etc. ...	21	1	...	...	...	...	13	5	7	...	...	...	2	...	2
36. Name of Inspector ...	J. G. Banks	H. H. Webb	E. M. Bate	G. H. Rawling	W. Nicholson	F. H. French	F. W. King	R. B. Macara	H. Miller	J. T. Heath	T. R. Swales	G. R. Bailey	C. D. Bright		E. W. Penn

18. No. of Bakehouses in District	No Report.	6	53	...	3	6	3	9
Frequency of Inspection		25	209	16	12	(d)	4	34
19. No. of Dairies and Milkshops		2	126	..	9	...	4	8
Frequency of Inspection		7	491	16	40	...	6	32
20. No. of Cowkeepers ...		25	12	...	4	10	4	7
Frequency of Inspection		98	109	8	42	...	...	23
21. No. of samples of milk taken for examination for cleanliness, etc. ...		...	...	...	...	...	...	6
22. Filthy houses cleansed.		5	117	...	15	...	...	...
23. Houses disinfected ...		44	802	7	45	10	8	59
24. Cases of Overcrowding abated		3	41	...	5	2	...	4
25. New houses. No. of water certificates applied for... ...		10	...	7	86	...	5	...
26. No. of certificates granted		10	...	3	86	...	5	...
27. Public wells sunk		...	...	...	...	...	...	...
28. Privies. No. in district		...	...	...	...	...	...	...
No. abolished during the year		20	...	...	...	...	88	2
29. No. of pail closets ...		161	..	7	...	...	450	...
30. No. of W.Cs. with proper flushing arrangements		680	(g)	2	33	...	41	...
31. No. of hand-flushed W.Cs.		419	...	468	...	.	9	...
32. Animals improperly kept removed ...		17	32	...	8	..	1	10
33. Samples of water taken for analysis ...		...	...	...	...	...	1	...
34. Compensation paid for bedding, clothing, etc., destroyed		...	...	...	...	...	...	...
35. Seizures of unsound meat, etc. ...		...	...	...	...	...	...	...
36. Name of Inspector ...		J. W. Medley	W.W. West	J. C. Brockwell	P. S. Howard	W. P. Perkins	R. H. Barrell	W. S. Mills

(a) Weekly. (b) Fortnightly. (c) Monthly. (d) Quarterly. (e) Frequently. (f) Half-yearly. (g) All houses.
(h) No record. (i) Taken by M.O.H. (j) Work done.

TABLE XXIV.

RURAL DISTRICTS.

SUMMARY OF REPORTS BY SANITARY INSPECTORS.

		Belchamp.	Billericay East.	Billericay West.	Braintree.	Bumpstead.	Chelmsford.	Dunmow.	Epping.	Halstead No. 1.	Halstead No. 2.	Lexden and Winstree.	Maldon.	Ongar.	Orsett.	Rochford.	Romford.	Saffron Walden.	Stansted.	Tendring.
1.	Complaints received	13	31	39	81	6	12	31	30	6	17	31	17	6	66	22	80	3	6	18
2.	Nuisances detected without complaint	79	154	387	12	43	257	314	...	96	114	96	139	126	400	264	447	82	150	339
3.	Nuisances abated	83	165	386	79	46	191	274	523	86	118	48	140	62	466	248	449	83	135	106
4.	Nuisances remaining unabated	3	20	76	4	...	78	119	...	10	9	79	53	64	...	16	14	2	15	233
5.	Formal Notices served	19	53	68	...	29	269	13	27	4	19	135	22	115	267	173	308	86	10	9
6.	Summonses issued	...	...	...	3	..	...	...	...	...	...	6	...	..	...	10	3	...	...	...
7.	Convictions obtained	...	...	...	3	..	...	...	...	...	...	5	...	...	...	10	3	...	...	...
8.	No. of cottages inspected	382	329	391	625	351	625	633	234	638	464	273	1077	253	570	500	2300	262	330	510
9.	No. of cottages found unfit for human habitation	61	15	3	94	6	...	18	...	11	69	5	13	6	3	8	6	7	6	11
10.	No. of representations made with the view of Closing Orders being made	11	11	3	94	1	3	2	...	11	45	3	13	6	28	8	2	7	6	...
11.	No. of Closing Orders made	1	...	2	18	1	2	2	...	9	13	3	8	6	28	8	2	7	...	5
12.	No. of cottages in which defects were remedied without a Closing Order	33	36	48	98	32	106	82	175	41	58	20	4	51	14	205	111	...	6	102
13.	No. of cottages in which defects were remedied after making Closing Order	1	...	...	1	...	...	2	...	9	9	1	1	2	15	...	1	2	...	..
14.	No. of cottages closed	1	...	2	6	6	1	2	...	2	...	3	4	4	3	8	7	2	2	..
15.	No. of cottages demolished by Order	...	...	...	4	...	...	...	...	...	...	...	6	..	1	...	...	...	..	...
16.	No. of common Lodging-houses in District...	...	...	...	...	...	...	1	...	...	...	..	...	...	1	...	...	...	...	...
	Frequency of inspection	...	..	...		...	...	(c)	...	.	...	...	...	...	24	...	..	...	...	6
17.	No of Slaughter-houses in District	3	7	5	24	2	18	16	8	6	5	...	18	6	13	35	13	10	4	25
	Frequency of inspection	...	(d)	(d)	(d)	2	(f)	65	122	(d)	20	41	(k)	(k)	42	..	(c)	...	34	46

18.	No. of Bakehouses in District	...	9	7	40	6	420	37	18	6	17	...	30	12	11	30	15	25	6	37
	Frequency of inspection	18	(f)	(f)	(d)	23	(f)	(f)	83	(d)	44	...	(k)	(k)	33	..	(c)	...	14	68
19.	No. of Dairies and Milk Shops	...	10	49	24	14	8	59	70	27	12	...	25	6	...	30	47	16	...	...
	Frequency of inspection	6	(f)	(f)	(d)	29	...	(f)	...	(d)	30	59	(k)	(k)	87	...	(c)	...	...	...
20.	No. of Cowkeepers	...	52	47	54	14	118	59	169	27	15	...	85	79	...	25	45	16	26	...
	Frequency of inspection	6	(f)	(f)	(d)	29	(f)	(f)	...	(d)	41	...	(k)	(k)	96	...	(c)	...	56	...
21.	No. of samples of milk taken for examination for cleanliness, etc.	...	...	...	...	...	13	...	...	...	...	...	3	...	1	...	...	...	...	...
22.	Filthy houses cleansed...	...	...	3	2	1	2	12	...	...	...	2	...	...	3	7	3	..	...	2
23.	Houses disinfected	8	26	35	68	14	62	60	32	12	9	70	12	20	108	60	31	63	6	69
24.	Cases of Overcrowding abated	2	4	5	...	3	4	8	17	4	3	9	2	5	4	10	2	...	6	1
25.	New houses	4	...	...	...	...	...	...	...	...	11	...	...	...	...	..	...	...	...	...
	No. of Water Certificates applied for ...	2	83	14	65	2	33	16	28	15	10	...	34	12	40	69	...	6	1	...
26.	No. of Certificates granted	2	68	13	65	...	33	15	28	15	10	...	30	12	40	69	...	3	1	...
27.	Public Wells sunk	...	..	...	1	...	2	...	...	...	...	...	...	...	...	...	...	2	...	...
28.	Privies. No. in district	...	200	280	...	314	...	...	...	633	789	...	1152	...	606	...	128	...	..	...
	No. abolished during the year	17	30	22	...	12	21	65	...	3	17	21	39	...	16	40	17	23	...	...
29.	No. of pail closets	...	800	580	...	212	2597	400	...	144	290	...	2373	...	545	800	429	...	...	..
30.	No. of W.C.'s with proper flushing arrangement...	...	250	1190	...	...	1327	150	...	76	173	...	385	...	1993	7	3568	...	...	...
31.	No. of hand-flushed W.C.'s	.	200	640	...	...	431	350	...	5	55	...	139	...	372	...	263	..	...	...
32.	Animals improperly kept removed	5	7	...	4	...	5	3	33	3	...	12	5	...	8	20	39	1	...	8
33.	Samples of water taken for analysis	11	12	13	16	..	43	25	23	2	10	...	39	2	4	9	15	3	6	29
34.	Compensation paid for bedding, clothing, etc., destroyed	...	...	72/-	...	...	...	£2/4	...	...	...	...	...	...	...	...	...	7/6	...	...
35.	Seizures of unsound food	...	...	...	...	...	1	16	14	...	...	...	...	1	...	2	...	...	...	...
36.	Name of Inspector	Sidney Allpress	R. J. W. Layland	S. J. Shelley	E. H. Bright	H. B. Thake	W. Edser	J. Plumbley	J. H. Bell and W. Beard	H. O. Cross	W. H. Eade	W. H. Filer	W. Almond	W. N. Jarvis	John Hurst	A. C. Madge	A. Cornell G. T. Carter	A. E. Pitstow	E. T. Watts	Ernest H. Grant

(a) Weekly. (b) Fortnightly. (c) Monthly. (d) Quarterly. (e) Frequently. (f) Half-yearly.
(g) All houses. (h) No. record. (i) Taken by M.O.H. (j) Work done. (k) Yearly.

SANITARY IMPROVEMENTS REQUIRED.

Many of the reports require very careful consideration to ascertain what improvements the Medical Officer of Health would like to see carried out, and often it is impossible to discover that any improvement is necessary. In the following summary therefore it does not follow that because a district is not mentioned that it is in a perfectly satisfactory condition but merely that definite information is lacking. It is unfortunate that some Medical Officers dare not express their views emphatically, as by so doing they would be likely to give offence and render their position, to say, the least, uncomfortable. On the other hand Authorities look to their Officers for guidance and if they hesitate to express opinions as to the necessity for any particular works being necessary, or the necessity for more effective administration their ability as public servants is greatly minimised.

I gather from the Reports of the past year (and occasionally of previous years) that the following are the chief requirements in the County :—

BARKING. Improvements at the Isolation Hospital to increase its efficiency and greater control over building operations such as could be obtained by a Town Planning scheme.

BRENTWOOD. An extension of the Urban boundaries. The town of Brentwood is really in 3 different sanitary districts, each part under the charge of different Inspectors and Medical Officers. Some permanent arrangement about Isolation Hospital accommodation is desirable.

BRIGHTLINGSEA. Here also more definite arrangements for the use of the Colchester Isolation Hospital is desirable and for the use of the Disinfector, to avoid the destruction of bedding, &c., with its attendant compensation.

BURNHAM. The so called Cottage Hospital here is not very satisfactory. It would be far better to arrange with the Maldon R.D.C. for the joint use of the proposed hospital at Southminster. Apparently also there are cesspools which require abolishing and back roads which are said to be "comparatively dangerous."

CLACTON. Cesspool nuisances occur in the outlying parts. These require attention. An improved Water Supply is needed but is receiving attention and should be proceeded with without delay. The Medical Officer of Health has expressed the opinion that a dust destructor would be of benefit to the town.

CHELMSFORD. The rapid growth of this Borough will necessitate many changes being made. More houses are urgently needed. The sewers are inadequate, the sewage farm does not effect sufficient purification of the sewage. Trouble arises from deposition and destruction of the house refuse, and a destructor is recommended. The water supply should be increased or definite arrangements made for supplementing the present supply when found necessary. The Hospital belongs to the Borough and rural district, both of which are increasing in population, and the provision of a third ward block should receive consideration.

COLCHESTER. I should like to see the Administration block at this Hospital considerably enlarged and permanent arrangements made with the surrounding authorities for reception of their patients. This is a perfectly feasible scheme and could be carried out with advantage to all concerned.

EAST HAM. The Isolation Hospital here has now assumed such proportion that a resident Medical Officer is desirable. As many Tuberculosis cases are now treated here this want is emphasised.

EPPING. More cottages are required here, better scavenging arrangements, and the Medical Officer of Health thinks a public mortuary is really wanted.

GRAYS. The requirements of the town so far as sewerage works are concerned will now be considered by the Joint Sewerage Board. A very pressing need is that of cottages and it is likely to increase with the development of the Docks.

HALSTEAD. From the high phthisis mortality here it is fairly obvious that the housing conditions require very careful consideration. The old sewers have often been reported as unsatisfactory and there is no record of any improvement. The Hospital could easily be enlarged and made to serve the town and rural district and the adjacent rural district of Belchamp.

LEYTON AND WALTHAMSTOW. If these districts could get rid of their sewage and sewage works it would be an advantage to both and certainly a great benefit to the Dagenham Brook.

MALDON. The question of providing a few cottages is worthy of further consideration, and some improvement should be made in the drainage of the lower parts of the town.

SHOEBURYNESS. The chief requirement here appears to be "cottages."

SOUTHEND. The Medical Officer of Health suggests several directions in which the favourable sanitary position this Borough has obtained may be maintained and improved. When it comes into existence as a County Borough further problems will be presented. I should like to see an arrangement made for both the sewage of Leigh and Hadleigh being taken into the Southend system. Certain old property at Leigh may require to be dealt with.

WALTHAM ABBEY. The sewering of Upshire should receive further consideration.

WITHAM. The Isolation Hospital difficulty mentioned by the Medical Officer of Health has just been satisfactorily settled, a definite arrangement having been made with the Maldon Joint Hospital Board. I wish also that the Council would devise a scheme whereby the storm overflow at the sewage works does not come into operation until the flow exceeds three times the normal.

WOODFORD. The flooding of parts of South Woodford must prejudically affect the healthiness of that locality and steps should be taken, if possible, to prevent it. The erection of houses on land liable to flood can now be prevented.

Belchamp Rural. This district has no isolation hospital. Negotiations should be commenced with Halstead to effect a combination.

Billericay. Apparently the crying need here is for more cottages. The Rural District Council are erecting a few and it is to be hoped that the experiment will be so successful that they will be encouraged to build many more. The enlargement of the hospital has been long delayed. It should be proceeded with. Nuisances arise at Ingrave and East Horndon from the discharge of slop water into numerous open ditches. The question of sewering deserves careful consideration.

Braintree. The attention of the Council should be especially directed to the pollution of the rivers which occur within their district, due to the sewage of Bocking, Coggeshall, Kelvedon, and Hatfield Peverel. The first named is probably the most urgent. It is probable also that cottages are required in certain parishes.

Chelmsford. Great difficulty is experienced in several parishes notably Buttsbury and West Hanningfield in obtaining a good and wholesome supply of water. These should receive attention. At Great and Little Waltham and Broomfield seven ditches pollute the Chelmer. The scavenging of Writtle wants further consideration. The quality of the water supplied from the springs at Great Baddow Waterworks requires careful watching. The provision of another ward block at the Isolation Hospital has been referred to under Chelmsford Borough. The scheme for providing a number of cottages should be proceeded with as rapidly as possible. The overflow of workmen from the Borough causes a great demand for houses in the parishes around.

Dunmow. Attention should be seriously directed to the various sources from which the Chelmer is polluted at Thaxted, Dunmow and Felstead, the Pant at Great Bardfield, and the Stort at Hatfield Broad Oak. The sewerage of Thaxted and Dunmow should not be longer delayed. The scavenging of these parishes also should be considered.

Epping. Cottages are urgently needed here. Overcrowding seems more prevalent than in any other rural district. The scavenging of Theydon Bois and the prevention of river pollution at Sheering also require attention.

Halstead. The Colne is polluted at the Hedinghams, Earls Colne and probably elsewhere. Something should be done to prevent this. The hospital accommodation is very far from being satisfactory and the suggestion to combine with the urban district and possibly with Belchamp Rural District should be favourably entertained.

Lexden and Winstree. The Medical Officer of Health thinks 6 to 8 houses are wanted in nearly every parish. The water supplies to the Wigboroughs, Salcots, Virley, Abberton and West Mersea want serious consideration as do also the drainage arrangements at Stanway, Rowhedge and West Mersea. A better arrangement with Colchester for the use of their isolation hospital is desirable.

Maldon. The scheme for providing Tollesbury with water should be proceeded with. Cottages are required in several parishes. The southern portion of the area wants some isolation accommodation.

ONGAR. The sewering and scavenging of High Ongar require attention, and the scavenging of Marden Ash. The disposal of the sewage at Blackmore should be improved.

ORSETT. Further enquiry should be made with respect to the cottage accommodation at Langdon Hills and in other parishes. The sewering of West Thurrock and Aveley should be proceeded with now that a Joint Drainage Board has been formed.

ROCHFORD. This District Council will have many serious problems to consider in the near future in connection with the sewering and sewage disposal at Rochford, Hadleigh, Rayleigh and Great Wakering. Probably water mains could be extended with advantage in several directions.

SAFFRON WALDEN. The pollution of the Cam by the sewage from Newport and Great Chesterford should be abated. The question of scavenging Littlebury wants further consideration.

TENDRING. A better supply of water is required for Little Holland and Great Bentley and the sewerage arrangements at Manningtree, Mistley, Lawford, Thorpe and Great Bentley want serious consideration. The arrangement with Colchester *re* reception of infectious cases into the Isolation Hospital should be reconsidered with the view of rendering it more permanent and satisfactory.

APPENDIX.

SUMMARY OF REPORTS OF MEDICAL OFFICERS OF HEALTH.

I. PORT SANITARY AUTHORITIES.

PORT OF COLCHESTER.

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

Vessels Inspected :—

Barges	386
Coasting vessels	18
Steam ships	13
Deep sea smacks	13
Yachts (steam and sailing)	34

Of these 5 sailing ships and 7 steam ships were from foreign ports.

For the first time for twenty-six years, during the tenure of office of the present Medical Officer of Health, all vessels visiting the port were in a satisfactory condition. This is attributed to the greater efforts of the Sanitary Authorities at the various ports.

No case of infectious disease occurred.

The port hospital is in a fairly satisfactory condition and ready for any emergency should occasion arise.

PORT OF HARWICH.

Medical Officer of Health ... H. GURNEY, M.R.C.S.

Number of vessels entering the port :—

From foreign ports	1,567
Coastwise	2,681

No case of infectious disease was notified. The hospital ship "Hope" has been overhauled and is ready to receive patients at very short notice.

The sanitary condition of the vessels was very satisfactory. Few defects were discovered and these were immediately rectified on attention being drawn to them.

A general increase in the amount of foodstuffs is noted. Over 78 tons were seized, and the Medical Officer of Health urges that an incenerator be erected, as the present method of burial on disused land is costly and cannot be continued indefinitely.

PORT OF MALDON.

Medical Officer of Health ... H. REYNOLDS BROWN, M.A., M.D.

Number of vessels entering the port :—

Coastwise	...	...	864
Foreign	...	...	20
	Total	...	884

Of these 271 were inspected by the Inspector of Nuisances and 613 by the Deputy Inspectors, the latter are the Petty Officers of Coast Guards at Bradwell, Goldhanger, Tollesbury, and West Mersea. Nine nuisances were detected (dirty forecastle and water tanks) and abated.

No case of infectious disease occurred.

The port is within the Maldon Joint Hospital area, with a permanent hospital for the ordinary infectious diseases at Heybridge. The Board has also tents, etc., stored on a site at Little Totham for the accommodation of cases of small pox, cholera, or plague should any of these diseases be imported.

Arrangements have been made for filling water tanks at Osea Island pier.

II. URBAN DISTRICTS.

BARKING.

Medical Officer of Health ... R. J. EWART, M.D., F.R.C.S., D.P.H.

Area in acres	...	3,805
Population, 1911 census ...	...	31,302
,, 1912 estimated	...	32,521
Deaths registered in the district	...	262
Corrections ... Additions	...	68
,, ... Deductions	...	—
Nett deaths	...	330

	1912.		Mean 1907-11.
Nett death rate	10·1	...	12·4
Infant mortality	93·3	...	57·
Birth-rate	29·	...	29·6

The Infant mortality rate is lowest on record, and only on one previous occasion has a lower death rate been recorded.

The Notification of Births Act is in force in the district and gives satisfactory results. Out of a total of 964 births registered 936 were visited; in 140 cases re-visits were necessary. The work at the Babies' Welcome continues, the mothers are encouraged to bring up their babies, whether ailing or not, so that a record of their weights may be kept and the development of the child discussed. In order to increase the attendance it is proposed that each meeting will be more of a social function in the future.

One thousand one hundred and thirty-two dwellings have been dealt with under the Housing and Town Planning Act. It is expected that the complete inspection of the district will be completed during the course of the next two years. Nineteen houses were found unfit for human habitation and 13 were closed.

House refuse is collected by the Council's Staff.

Water supply and sewerage are not mentioned.

Dairies, milkshops, etc., are maintained in a satisfactory condition.

Three hundred and one cases of infectious disease were notified, 35 diphtheria, 42 erysipelas, 95 scarlet fever, 10 enteric fever, 2 puerperal fever, 3 poliomyelitis, 104 pulmonary tuberculosis, and 10 ophthalmia neonatorum.

BRAINTREE.

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

Area in acres	2,224
Population, 1911 census	6,168
„ 1912 estimated ...	Figures not given.
Deaths registered in the district ...	75
Corrections ... Additions ...	17
„ ... Deductions ...	—
Nett deaths	92

	1912.	Mean 1907-11.
Nett death rate	14·9 ...	14·4
Infant mortality	53· ...	51·2
Birth rate	21·4 ...	22·4

No report received.

BRENTWOOD.

Medical Officer of Health ... S. FRASER, L.R.C.P., L.R.C.S.

Area in acres	460
Population, 1911 census	6,923
„ 1912 estimated ...	6,939
Excluding institutions	5,510
Deaths registered in the district ...	37
Corrections ... Additions ...	15
„ ... Deductions ...	9
Nett deaths	43

	1912.	Mean 1907-11.
Nett death rate	6·18 (8·4) ...	8·7
Infant mortality	8·7 ...	75·
Birth rate	16·2 (22) ...	16·3

The death and birth rates are estimated on the whole population, if the population of the different institutions be excluded the rates would be 8·4 and 22 respectively There was only one death of a child under one year of age during the year.

The water supply is from the South Essex Water Company's mains. There has been a constant supply and no complaints have been received. There are nineteen houses in the district which are unconnected with the mains.

The new sewage works were formally opened by the County Medical Officer on October 24th. The effluent at the present time is very satisfactory. There are 362 hand flushed water closets in the district and only 2 pail closets and 1 privy, the former are being gradually improved by the addition of proper flushing cisterns. House refuse is removed once a week by a Contractor. Nuisances when detected are usually abated after serving an informal notice, if not, a formal notice or a letter from the Clerk almost invariably produces the desired result. The majority of nuisances occurred under the Housing and Town Planning Act.

Premises controlled by bye-laws and regulations are periodically inspected and found to be satisfactory. There are no dairy farms in the district.

Housing on the whole is satisfactory, and there is a sufficiency of open spaces. Five cases of overcrowding were detected, all of which have been remedied. Two case which occurred the previous year were prosecuted and convictions were obtained.

The general sanitary administration is satisfactory. There is no Isolation Hospital in the district but by an arrangement with the Billericay Rural District Council cases are removed to their hospital at Billericay. An enlargement of the hospital is contemplated so as to make it more suitable for the requirements of the districts.

The infectious diseases notified during the year are 23 in number, 6 being scarlet fever, 4 erysipelas, 3 diphtheria, 1 puerperal fever, and 9 pulmonary tuberculosis· Antitoxin is supplied free of charge on application by the Medical Attendant. Most of the cases of phthisis notified were out-patients at some of the London hospitals. The homes are visited and advice given. The zymotic death rate was nil. There were only 2 deaths from phthisis.

BRIGHTLINGSEA.

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

Area in acres	2,867
Population, 1911 census	4,404
„ 1912 estimated	4,392
Deaths registered in the district ...	56
Corrections ... Additions ...	9
„ ... Deductions ...	—
Nett deaths	65

	1912.	Mean 1907-11.
Nett death rate	14·7 ...	13·
Infant mortality	21·9 ...	80·5
Birth rate	20·7 ...	18·1

The district comprises a considerable rural area. The water supply in the rural part is from shallow wells which are liable to pollution. At four cottages the nearest supply is 300 feet away, the well is quite free from the danger of pollution, and as it was considered healthier to have to go 300 feet for a good supply than to have a supply close at hand liable to pollution the provision of a well at these cottages has not been enforced. The water supply to the urban area is from the Council's works. The water is derived from two bores, 200 feet deep, reaching the chalk. Water is hard and makes a bulky deposit in cookery utensils, consequently some of the inhabitants still use water from shallow wells which does not cause this deposit. The Medical Officer of Health again suggests that the water should be softened.

Sewage works are on the alumino-ferric precipitation system. The effluent which is stated to be a very good one is stored until it can be discharged with the ebb tide within two hours of high water. In this way the effluent is carried directly out to sea, and none of it reaches Brightlingsea Creek where there are oyster beds. The outfall is 800 yards from the nearest oyster laying. A law suit relating to these works has not yet come into court. (The case has since been withdrawn.)

The house refuse is removed weekly in the urban area, and a few houses in the rural area are also scavenged.

The milk supply is considered to be good. The appointment of a Veterinary Surgeon to examine cows has been considered by the Council but nothing definite has yet been settled.

Premises under the control of the Council are supervised. No complaint has been made during the year of any disease being caused by Brightlingsea oysters.

The housing is said to be in a satisfactory condition. It has not been necessary to take any action under the Housing of the Working Classes Act.

Nine cases of infectious disease have been notified; 1 erysipelas, 2 scarlet fever 3 enteric fever, 3 pulmonary tuberculosis. The source of infection in the enteric fever, cases could not be traced satisfactorily, they do not appear to have been caused by oysters. The cases of phthisis were visited and advice given.

BUCKHURST HILL.

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

Area in acres ...	...	...	873
Population, 1911 census ...		...	4,887
,, 1912 estimated ...		...	4,900
Deaths registered in the district		...	43
Corrections ...	Additions	...	8
,, ...	Deductions	...	6
Nett deaths ...	...	...	45

	1912.	Mean 1907-11.
Nett death rate	9·1 ...	10·2
Infant mortality	58· ...	80·6
Birth rate	14· ...	20·

Inspections under the Housing and Town Planning Act have been actively carried on during the year. Most of the defects found were of a trifling nature and were remedied by the landlord upon application. One closing order was made but was withdrawn on the house being put into habitable repair.

The Council's Sewage Works takes the sewage from the eastern slope of the hill, the western slope is treated at the Woodford Western Works. These are in a satisfactory condition. The water in the Forest Pond on the High Road is dirty and stagnant and the Medical Officer of Health recommends that the pond be thoroughly cleaned out.

House refuse is collected by the Council's men once a week.

The water supply is from the Metropolitan Water Board's wells at Waltham Abbey and Chingford Mills. It is hard but constant and adequate.

Premises under the control of the Council are regularly inspected and are kept in a satisfactory condition.

New latrines and cloak rooms have been erected at the Infants' School.

Seventeen cases of infectious desease have been notified during the year; three of erysipelas, 1 scarlet fever, 2 enteric fever, and 11 pulmonary tuberculosis. Pulmonary tuberculosis cases are visited and advice given.

BURNHAM-ON-CROUCH.

Medical Officer of Health ... T. D. WHITE, L.S.A.

Area in acres	4,517
Population, 1911 census	3,190
,, 1912 estimated	3,215
Deaths registered in the district ...	36
Corrections ... Additions ...	9
,, ... Deductions ...	—
Nett deaths	45

	1912.	Mean 1907-11.
Nett death rate	13·9 ...	10·7
Infant mortality	50·8 ...	21·5
Birth rate	18·3 ...	20·2

The scarlet fever epidemic which commenced in the autumn of 1911 continued into the spring of 1912. Nine cases of disease were notified but the epidemic was a comparatively mild one, there being no fatal cases. The hospital, which is temporary in character, has been enlarged, an annexe capable of holding eight beds has been added. After the epidemic came to an end the building was cleansed and disinfected and then closed. The question of a permanent isolation hospital for the urban district and the surrounding neighbourhood is receiving the attention of the Council, but the Medical Officer of Health thinks that the present arrangement is quite sufficient for the needs of the district.

There have been very few buildings erected during the year.

Daries and cowsheds, slaughterhouses, bakehouses, etc., are periodically visited.

The water supply has been constant and the quality of the water is highly satisfactory. The supply has been augmented by laying an extra main to Ostend, a distance of 1½ miles, and the installation of another water tank capable of holding 5,000 gallons.

The town is well sewered and the sewage is treated on bacteria beds. The outfall is well below the town. The crude sewage from the yachts is put into the river but no ill effects have been traced to this source.

Cesspools, especially in Church Road, continue to give trouble. A scheme to do away with them and connect the houses to the sewers is before the Council.

Scavenging is by contract and the refuse is removed weekly.

The question of providing a public convenience is being considered.

Thirteen cases of infectious disease have been notified: 9 scarlet fever, 1 erysipelas, and 3 pulmonary tuberculosis. The latter cases are visited and advice given.

CHELMSFORD.

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

Area in acres ...	...	...	3,112
Population, 1911 census ...		...	18,008
,, 1912 estimated		...	18,307
Deaths registered in the district		...	214
Corrections ...	Additions	...	9
,, ...	Deductions	...	46
Nett deaths ...	...	...	177

	1912.	Mean 1907-11.
Nett death rate	9·6 ...	9·9
Infant mortality ...	69·4 ...	66·6
Birth rate	19·6 ...	20·6

During the year 132 houses have been built, of these 104 can be called houses for the working classes. These included 38 built by the Corporation at Rainsford End. There is still a demand for cottages and the Borough Engineer is preparing a scheme for the erection of 100 more on the site at Rainsford End.

During May it was found that the water derived from the spring at Admiral's Park was contaminated, the report of the analysis was so unsatisfactory that the supply was immediately stopped. After a good deal of investigation it was discovered that the rain water falling on to the roof of the reservoir could percolate into the tank. Cement troughing was run round the sides, and a recurrence will now be prevented. The Medical Officer of Health points out that the water supply is derived solely from three wells, two of which are surface wells. The risk of pollution of the two latter is great, and should this occur the town might possibly be threatened with a water famine.

The bore at Galleywood has been sunk to a depth of 450 feet and an ample supply of water obtained, the yield of water has warranted the sinking of a bore-hole of increased diameter, and this work has been commenced. It is hoped that it will be completed by the summer when the supplies from the other sources may be dispensed with and kept in reserve only.

Chelmer. The Medical Officer of Health thinks this river is grossly polluted, and suggests that it is in part due to the sewage of the Walthams and Broomfield. He is apparently unaware of what has been done by the Chelmsford Rural District Council or the County Council, but expresses the opinion that if the sewage of Waltham and Broomfield is properly treated the condition of the river will greatly improve.

Several new sewers have been laid, these have not been ventilated which would appear to be a serious oversight. The whole question of the sewerage of the borough has been before the Council, the present sewers were laid 50 years ago when the population was 8,000, it is now over 18,000 so that the capacity of the present system must be taxed to its utmost. One hundred and sixty-six hand flushed closets have been provided with proper flushing cisterns.

House refuse is collected once a week, about 5,000 large loads have to be disposed of per annum, of these 2,000 are tipped on land and 3,000 are sent to the "Destructor." No complaints have been received regarding the tipping but several have been made regarding the way the work is carried out at the "destructor." This destructor is privately owned and the Medical Officer of Health has suggested several regulations which should be observed in the carrying out of the work. The owners however do not appear to give any satisfactory answer to these observations. The Medical Officer of Health urges that a adequate destructor should be built without delay, and also that there should be more frequent collection of the refuse.

Premises under the control of the Council are well supervised. A public abattoir is advocated. During the year Mr. Mulvey, F.R.C.V.S., was appointed Veterinary Surgeon, and all cows in the borough are inspected. The Veterinary Surgeon and the Inspector of Nuisances also attend the market and all animals exposed for sale are examined.

Two hundred and eighty-one houses were inspected under the Housing and Town Planning Act. Closing orders were issued in three instances.

The number of cases of infectious disease notified is 142; 25 diphtheria, 71 scarlet fever, 2 enteric fever, and 44 pulmonary tuberculosis. Most of the cases of scarlet fever occurred in connection with one school which was closed on three occasions. It would appear that the cleansing and disinfecting had not been done in a proper way. The matter on being reported to the Sanitary Committee was dealt with in a summary and effective manner. An enlargement of the isolation hospital so that cases of enteric fever, cerebro-spinal fever, and anterior poliomyelitis may be treated is again strongly advocated.

A list of improvements in progress or required is given. *Vide* special section.

The report of the Veterinary Surgeon is incorporated with that of the Medical Officer of Health's. Out of 300 cows in the borough 26 have been tested with tuberculin and of these 9 have reacted. All the latter are being kept under observation. Six cows and six pigs were removed from the market. Some improvements to cowsheds and slaughterhouses are recorded.

CHINGFORD.

Medical Officer of Health ... T. STANBURY BROOK, M.R.C.S., L.R.C.P.

Area in acres	2,808
Population, 1911 census	8,186
,, 1912 estimated ...	8,680
Deaths registered in the district ...	71
Corrections ... Additions ...	27
,, ... Deductions ...	16
Nett deaths	82

	1912.	Mean 1907-11.
Nett Death rate	9·4 ...	8·3
Infant mortality	86·5 ...	62·
Birth rate	21·3 ...	21·6

The district appears to be growing very rapidly, the population at the 191 census was 8,180, and at mid year 1912 8,680, an increase of 494.

The water supply is from the Metropolitan Water Board's wells in the Le Valley. It is hard, but perfectly pure.

Two new sewers have been completed during the year. Those houses which still have cesspools are being connected to the sewers as quickly as possible.

House refuse is removed weekly by a contractor.

Inspection of houses under the Housing and Town Planning Act has been actively carried on. It has not been necessary to issue any closing orders.

The Medical Officer of Health suggests that the School Medical Service and the Public Health Service should be linked up. In this way closer observation could be kept over the children when a contagious disease makes its appearance.

Sixty-six cases of infectious disease were notified : 29 diphtheria, 2 erysipelas, 18 scarlet fever, 1 enteric fever, and 16 pulmonary tuberculosis.

CLACTON-ON-SEA.

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

Area in acres	4,069
Population, 1911 census	9,777
„ 1912 estimated ...	9,851
Deaths registered in the district ...	124
Corrections ... Additions ...	7
„ ... Deductions ...	37
Nett deaths	94

	1912.	Mean 1907-11.
Nett death rate	9·5 ...	12·5
Infant mortality	86·4 ...	89·
Birth rate	16·4 ...	22·

This is a popular health resort and many of the present inhabitants came to the town for health's sake originally. It would appear to be especially suitable for cases of tuberculosis or nervous debility. During the season the population is greatly increased—from 9,851 to nearly 70,000.

The water supply is good and abundant. It is pumped from the Council's well at Great Bentley about 12 miles off and passes through filter beds. A new supply from a deep well bored into the chalk is expected to be in use in a few months.

Sewage is conveyed well out to sea, and there is no return of offensive matter to the beach.

Except for a few privies in the rural part of the district all houses have water closets.

Scavenging is undertaken by the Council. The refuse is carted out of the town and part is burned. A proper destructor is advocated.

Owing to the increasing duties required of the Sanitary Inspector, it is suggested that a lady health visitor be appointed.

Premises controlled by the Council are well supervised. During the season milk comes from London and even Somersetshire. Until recently four samples of milk were taken per mensem and examined by the Medical Officer of Health, but as the County Council claimed all the fines after a successful prosecution, this has been dropped.

During the year 144 houses were inspected. One closing order was issued. Many of the defects discovered have been attended to.

During the year 68 cases of infectious disease have been notified, 1 small-pox, 6 diphtheria, 2 erysipelas, 29 scarlet fever, 5 enteric fever, 25 pulmonary tuberculosis.

The case of small-pox occurred in a visitor, there is no mention of the source of infection. The patient had not been vaccinated, and the case was a severe one. He was treated at the small-pox tents.

COLCHESTER.

Medical Officer of Health ... W. F. CORFIELD, M.D., D.P.H.

Area in acres	...	11,333
Population, 1911 census ...	...	43,463
,, 1912 estimated	...	44,160
Deaths registered in the district	...	500
Corrections ... Additions	...	20
,, ... Deductions	...	50
Nett deaths	...	470

	1912.		Mean 1907-11.
Nett death rate	10·6	...	12·
Infant mortality	64·1	...	92·
Birth rate	19·7	...	23·4

The population given above includes 4,326 persons belonging to the Garrison. The death rate, 10·6, is the lowest that has yet been recorded in the town, the infant mortality rate is also a record, and the birth rate is also the lowest on record.

The Notification of Births Act is in force and has worked quite smoothly. Three visits are paid by the Health Visitors to each case, the first one in the first week after the third day, the second at the end of the first month, and the third at the end of the third month.

The water supply continues satisfactory. The quantity of water pumped was 2,000,000 gallons less than last year.

The sewer at Shrubb End has been completed during the year. Refuse is collected weekly and deposited at various tips. The need of a refuse destructor is again mentioned.

Premises under control of the Council are well supervised. All the cows in the borough have been examined twice by a Veterinary Surgeon. Seven samples of milk were taken from animals which showed signs of tuberculosis, and in one of these tubercle bacilli were found. The animal was slaughtered and at the *post-mortem* the udder alone was found to be diseased. Offensive trades have been carried on without giving rise to nuisance.

Three thousand four hundred and ninety-five houses were visited and inspected. Thirteen closing orders were made. A large number of covered sanitary receptacles for house refuse has been provided during the year.

One hundred and eighty-five cases of infectious disease were notified during the year: 28 scarlet fever, 31 diphtheria, 1 typhoid fever, 38 erysipelas, 2 acute poliomyelitis, and 85 pulmonary tuberculosis.

The number of scarlet fever cases is the lowest recorded. Arrangements have been made between the Councils of Brightlingsea, Lexden and Winstree, Walton-on-the-Naze, and Frinton-on-Sea, and the Borough Council, whereby cases of infectious disease are admitted to the Borough Hospital. Previous arrangements existed with the Wivenhoe and Tendring Councils. Eight beds are set apart at the hospital for the treatment of pulmonary tuberculosis.

EAST HAM.

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

Area in acres	3,324
Population, 1911 census	133,504
„ 1912 estimated ...	138,450
Deaths registered in the district ...	1,069
Corrections ... Additions ...	426
„ ... Deductions ...	21
Nett deaths	1,474

	1912.	Mean 1907-11.
Nett Death-rate	10·6 ...	11·5
Infant Mortality	71· ...	102·6
Birth rate	25·8 ...	27·9

East Ham is one of the 95 great towns of England and Wales and included in Greater London. The population consists chiefly of clerks, warehousemen, mechanics, postal officials, and men employed at the docks, gas works, and local factories.

The Borough is well supplied with houses and tenements, and as most are of recent construction, they are in a satisfactory condition. The Council own 220 artisan's dwellings which are let at 6s. 6d. per week for the ground floor and 7s. 6d. per week for the first floor. 2,437 houses were inspected under the Housing and Town Planning Act, it was not found necessary to obtain any closing orders.

There are eight public conveniences for men, but the accommodation for women is unsatisfactory.

House refuse is removed by contract weekly. A number of complaints were received about men causing a nuisance by turning the refuse on to the forecourts. The police were informed and the practice has ceased. The refuse is consumed in the destructor and the heat utilized for the generation of steam.

The sewage works continue to give satisfactory results.

A new covered-in public swimming bath was opened in the spring and has been much appreciated.

Water is supplied by the Metropolitan Water Board. The service is constant and the quality of the water excellent. Most houses have now a direct supply, storage cisterns gradually being done away with.

Much good work is done at the Baby Clinic. Over 300 babies are on the register and the attendance numbers from 70—90 mothers with their infants. A baby show, which was quite successful, was held in September.

The notifications include 435 cases of scarlet fever, 72 of diphtheria, 13 of enteric fever, 8 puerperal fever, 2 cerebro-spinal meningitis, 2 poliomyelitis and 365 pulmonary tuberculosis.

Thirty-five beds are reserved at the Isolation Hospital for the treatment of pulmonary tuberculosis.

The Metropolitan Asylums Board have notified the Council that they can no longer admit cases of small-pox from the Borough to their hospitals, The agreement with West Ham whereby cases can be admitted to their hospital at Dagenham is still in force.

There are 139 beds at the Isolation Hospital, but there is no resident medical man. The diphtheria, enteric wards, and open air shelter, together with the administration block are temporary structures of wood and iron.

EPPING.

Medical Officer of Health ... TREVOR FOWLER, L.R.C.P. & S., D.P.H.

Area in acres	1,420
Population, 1911 census	4,253
,, 1912 estimated ...	4,322
Deaths registered in the district ...	57
Corrections ... Additions ...	6
,, ... Deductions ...	26
Nett deaths	37

	1912.	Mean 1907-11.
Nett Death-rate	8·8	... 11·2
Infant mortality	46·1	... 80·
Birth-rate	15·5	... 21·

The population includes 155 aliens in the workhouse. The nett population is 4,107, and the statistics are calculated on this figure.

The water supply is from wells sunk into the chalk at Sawbridgeworth, belonging to the Herts and Essex Water Co. It is abundant and of excellent quality though somewhat hard. The Medical Officer of Health suggests it should be softened.

There are sewer outfalls on north and south sides of the district. Sewage is treated by precipitation, bacteria-tanks, and irrigation, and the effluent is of good quality. The number of closets with flushing cisterns is increasing year by year.

House refuse is removed by a contractor fortnightly. More frequent removal is desirable, especially during the summer months. Many houses require to have portable covered dustbins provided.

Eighty-five houses were inspected under the Housing and Town Planning Act, and of these no less than 48 were found unfit for human habitation. In 30 cases the defects were remedied without a closing order being made. Four houses were closed. No new houses were built during the year, but an inn which was closed was converted into two small dwelling houses. Overcrowding is frequently met with.

Premises over which the Council have control are frequently inspected and usually found satisfactory.

The number of cases of infectious disease notified was 38: diphtheria 3, erysipelas 2, scarlet fever 22, pulmonary tuberculosis 11.

FRINTON-ON-SEA.

Medical Officer of Health ... H. W. GODFREY, M.D.

Area in acres	422
Population 1911 census	1,510
„ 1912, estimated ...	1,570
Deaths registered in the district ...	10
Corrections ... Additions ...	4
„ ... Deductions ...	2
Nett deaths	12

	1912.	Mean 1907-11.
Nett death rate	7·6 ...	4·8
Infant mortality	40· ...	46·8
Birth rate	15·9 ...	15·8

The housing accommodation in the district is good and ample. Inspections have been made, but the defects found were of a minor character.

The water supply is obtained from the Tendring Hundred Waterworks Company. The supply is plentiful and uniformly good.

House refuse is removed by a contractor. During the summer months it is collected three times per week. Since this more frequent removal was instituted complaints have been greatly reduced.

The main sewer discharges well out to sea, and there have been no complaints of offensive matter on the beach. All the houses are connected to the sewers.

Premises under control of the Council are well supervised.

The Local Government Board has given consent to the purchase of land for a cemetery at Kirby Cross.

One case of scarlet fever, one case of erysipelas, and three of pulmonary tuberculosis have been notified during the year. Arrangements have been made between the Council and Colchester Corporation, whereby the former may send cases of infectious disease to the Isolation Hospital at Colchester.

GRAYS THURROCK.

Medical Officer of Health ... J. A. WARD, M.D.

Area in acres	1,359
Population, 1911 census	16,003
„ 1912, estimated ...	16,420
Deaths registered in the district ...	127
Corrections ... Additions ...	36
„ ... Deductions ...	0
Nett deaths	163

	1912.	Mean 1907-11.
Nett death rate	9·9 ...	10·1
Infant mortality	86· ...	79·2
Birth rate	24·4 ...	28·1

The inhabitants of this district belong chiefly to the labouring classes, and are largely employed at Tilbury Docks and at the cement works.

The water supply is from the South Essex Company's mains. It has been constant and plentiful throughout the year.

Two hundred and four houses were inspected under the Housing and Town Planning Act, and notices were served in respect of 82. All these notices were complied with in a satisfactory manner.

There is a large and increasing demand for houses suitable for the working classes, but very little is being done by private enterprise to meet this demand.

A Joint Sewage Board representing the parishes of Grays, Tilbury, East and West Thurrock, and Stifford has been formed, and will take over all matters relating to the sewerage of these parishes from March 31st, 1913.

Scavenging is not referred to.

Premises over which the Council have supervision are frequently visited, and several defects have been remedied.

One hundred and twenty-four cases of infectious disease have been notified during the year; 22 diphtheria, 7 erysipelas, 74 scarlet fever, 3 enteric fever, 1 puerperal fever, and 17 pulmonary tuberculosis.

The Council maintain a bed at Benenden Sanatorium, and also had an additional bed for five months. One female patient was maintained in Eversfield Chest Hospital for two months.

HALSTEAD.

Medical Officer of Health ... C. GORDON ROBERTS, M.B.

Area in acres	647
Population, 1911 census	6,265
,, 1912 estimated ...	6,300
Deaths registered in the district ...	76
Corrections ... Additions ...	2
,, ... Deductions ...	13
Nett deaths	65

	1912.	Mean 1907-11.
Nett death rate	10·3 ...	13·8
Infant mortallty	39·6 ...	103·7
Birth rate	16· ...	17·6

No report.

HARWICH.

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

Area in acres	1,541
Population, 1911 census	13,623
,, 1912 estimated ...	13,973
Deaths registered in the district ...	130
Corrections .. Additions ...	36
,, ... Deductions ...	3
Nett deaths	163

	1912.	Mean 1907-11.
Nett death rate	11·6	12·7
Infant mortality	73·5	98·2
Birth rate	24·3	28·5

The sewers in several streets in the low-lying parts of the town have been re-laid, a surface water sewer has also been provided. Automatic screens and new pumps, electrically driven, have been installed at the pumping station. By this means it is hoped that the flooding which takes place in the low-lying parts of the town will be avoided in the future.

Special reference is made to the work under the Housing and Town Planning Act. The number of houses inspected was 25, 9 closing orders were made and 13 houses were closed voluntary. It is expected that 84 five-roomed cottages will soon be erected in Dovercourt, but the Council is advised to consider the desirability of erecting houses if the scheme does not proceed apace. An additional Inspector, whose chief duty will be to inspect houses, is to be appointed.

Premises under the control of the Council are well supervised.

The water supply is highly satisfactory.

Thirty-nine cases of infectious disease were notified: 8 diphtheria, 6 erysipelas, 4 scarlet fever, 9 enteric fever, 1 poliomyelitis, and 11 pulmonary tuberculosis. The cases of enteric fever occurred towards the end of the year, they were definitely traced to a typhoid carrier who was employed at a dairy farm.

ILFORD.

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

Area in acres	8,496
Population, 1911 census	78,205
,, 1912 estimated ...	80,615
Deaths registered in the district ...	828
Corrections ... Additions ...	126
,, ... Deductions ...	313
Nett deaths	641

	1912.	Mean 1907-11
Nett death rate	8·3 ...	8·8
Infant mortality	63· ...	76·5
Birth rate	19·4 ...	22·8

The Notification of Births Act is in operation and has worked well and been of great benefit to the community.

The water supply is partly from the Metropolitan Water Board and partly from the South Essex Company. In the out-lying parts of the district shallow wells are still in use, but the number keeps gradually diminishing.

One hundred and fifty-one houses were inspected under the Housing and Town Planning Act. The Medical Officer of Health considers that more attention will have to be paid to this work as the number of inspections is small. Most of the defects found were of a minor character and no houses were found unfit for human habitation.

In the out-lying parts of the district there are 168 cesspools, privies, and pail closets, all other houses are connected to the sewers. At present the Council have under consideration the question of emptying the cesspools.

House refuse is removed once a week by the Council's Staff. The Local Government Board has sanctioned a loan for the purchase of land for the erection of a dust destructor, as the present tip is rapidly getting filled up and there is difficulty in obtaining a new one within a reasonable distance, hence the necessity for a destructor is apparent.

There are three public latrines in the district, the provision of another has been under consideration.

A complaint was received from the Thames Conservancy that a surface water drain was discharging sewage into the river Roding, but on investigation the matter was not substantiated. The Medical Officer of Health considers that the pollution of this river comes up stream with the tide.

A bacteriological laboratory has been fitted up and work was commenced on March 11th. During the year 775 specimens were examined.

Premises under the control of the Council are properly supervised, 13 seizures of unsound food have been made.

Six hundred and sixty-six cases of infectious disease were notified during the year: 139 diphtheria, 57 erysipelas, 286 scarlet fever, 4 enteric fever, 6 puerperal fever, 1 poliomyelitis, and 173 pulmonary tuberculosis. There is an excellent isolation hospital.

LEIGH-ON-SEA.

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

Area in acres	1,527
Population, 1911 census	7,716
,, 1912 estimated ...	8,550
Deaths registered in district ...	81
Corrections ... Additions ...	17
,, ... Deductions ...	2
Nett deaths	96

	1912.	Mean 1907-11.
Nett death rate	11·2	... 10·5
Infant mortality	85·1	... 82·0
Birth rate	16·4	... 21·5

The district continues to develope. Twenty years ago Leigh was but a small fishing village consisting of an aggregation of small wooden houses.

The supply of water is in the hands of the Southend Water Co. and was constant and abundant.

Several new sewers have been laid. The effluent from the sewage works has been analysed on several occasions and with a fairly satisfactory result.

House refuse is removed by a contractor and is performed weekly. The refuse is carted to the Leigh Park Brickfields.

The premises under the control of the Council have been efficiently supervised.

Twenty-five cases of infectious disease were notified: two diphtheria, 1 erysipelas, 10 scarlet fever, 3 enteric fever, and 9 pulmonary tuberculosis. There is no Isolation Hospital.

By the time this report is in print, this Urban District will probably have become part of the County Borough of Southend.

LEYTON.

Medical Officer of Health ... J. F. TAYLOR, M.R.C.S., D.P.H.

Area in acres	2,594
Population, 1911 census	124,736
,, 1912 estimated ...	126,700
Deaths registered in the district ...	2,302
Corrections ... Additions ...	188
,, ... Deductions ...	1,147
Nett deaths	1,343

	1912.	Mean 1907-11.
Nett death rate	10·6 ...	10·2
Infant mortality	79·7 ..	84·4
Birth rate	22·1 ...	24·8

Nearly all the building sites in the district have been used up, it is evident, therefore, that the limit of the expansion of the building in the area has been reached.

The new manholes for the surface water sewers have almost been completed. One new sewer has been laid and the question of re-laying some others which are defective is under consideration. The sewage is treated chemically. An additional tank for dealing with storm waters is required. The Dagenham Brook suffers considerable pollution by the sewage effluents of Leyton and Walthamstow.

House refuse is removed by a contractor in carts, only covered with tarpaulin. In the previous year's report properly covered carts were recommended, but these, however, have not yet been provided. A proposal to close down the destructor and shoot the house refuse on to a vacant piece of ground was not entertained by the Council.

The Metropolitan Water Board continue to supply the district with an abundance of good and wholesome water.

There are two underground conveniences in the district and one or two more are required.

Food and milk supplies are vigilantly supervised and there have been several seizures of unsound meat and fish.

A health visitor was appointed during the latter half of this year and the appointment has already been justified.

The adoption of the Notification of Births Act has again been considered. It was felt that to make the Act of any real value it would be necessary to appoint a second Health Visitor. Having regard to the low infant mortality rate and the fact that most of the deaths of children under one year of age were due to ante-natal causes this course was not considered justifiable.

Three thousand one hundred and seventy-nine houses have been inspected and the insanitary conditions found to exist have been remedied, in many instances structural work has been efficiently carried out.

Premises under the control of the Council are well supervised.

The isolation hospital, which is of a temporary character, continues to give satisfaction to all concerned. Several improvements have been effected during the year including a new waiting-room and new porter's lodge.

A letter was received on 5th November, 1912, from the Metropolitan Asylums Board, giving definite and final notice to terminate the agreement between them and the Council with regard to hospital accommodation for cases of small pox. Four months' notice was given. On the advice of the Medical Officer of Health, the Public Health Committee recommended the Council to enter into an agreement with the Borough of West Ham to receive cases of small-pox into their hospital. West Ham agreed to do this on certain terms and the Local Government Board has been approached with a view of obtaining their consent to raise a loan for this purpose.

The infectious diseases notified include 155 of diphtheria, 330 scarlet fever, 20 enteric fever, 16 puerperal fever, and 370 pulmonary tuberculosis.

LOUGHTON.

Medical Officer of Health ... A. BUTLER HARRIS, M.A., M.B.

Area in acres	3,961
Population, 1911 census	5,433
,, 1912, estimated ...	5,500
Deaths registered in the district ...	50
Corrections ... Additions ...	11
,, ... Deductions ...	2
Nett deaths	59

	1912.		Mean 1907-11.
Nett death rate	10·7	...	9·6
Infant mortality	66·6	...	77·1
Birth rate	19·0	...	18·6

A residential, hilly, and well-wooded district. A large portion of the district round the inhabited area is grazing land rented by dairy farmers.

The water supply is from the Metropolitan Water Board's wells in the Lea Valley, and which are sunk into the chalk. It is pure, but hard.

The river Roding flows through the district and receives the effluent from the sewage works, but is not polluted thereby. The sewerage and drainage of the district is particularly satisfactory. The bacterial treatment of the sewage continues to give good results. All the houses in the district, with the exception of about eight in the outlying parts, are provided with water closets connected to the sewers.

House refuse is collected once a week by the Council's men.

Fifty-nine houses have been inspected under the Housing and Town Planning Act, and one was found unfit for human habitation and was closed. In most of the others the defects found were remedied.

Premises under the control of the Council are well supervised.

Bacteriological and chemical examinations are carried out at the private laboratory of the Medical Officer of Health.

Thirteen cases of infectious disease were notified: 2 scarlet fever, 1 enteric fever and 10 pulmonary tuberculosis.

MALDON.

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

Area in acres	3,028
Population, 1911 census	6,253
„ 1912, estimated ...	6,335
Deaths registered in the district ...	115
Corrections ... Additions ...	5
„ ... Deductions ...	32
Nett deaths	88

	1912.	Mean 1907-11.
Nett death rate	13·8 ...	13·3
Infant mortality	70· ...	92·2
Birth rate	17·8 ...	20·8

Water supply is from two wells sunk into the Thanet Sands. In 1911 an attempt to increase the yield of the Spital well by boring proved futile. This year attention has been directed to the Wantz Road well. A new 6in. bore was sunk to a depth of 290 feet and test pumping yielded 3,000 gallons per hour. New pumps and a new engine have been installed. By this means the total supply is raised from 75,000 gallons to about 170,000 gallons per diem. There are also private wells at two breweries and at the Union-house.

Most of the sewage of the town is conducted to tanks, and is discharged from these on to the ebb tide into the Blackwater Estuary. The houses on the north slope of the hill are drained by short sewers to the river. On the north side of the river most of the houses have pail closets. These are emptied twice a week by the Council's men.

House refuse is removed weekly by the Council's staff.

The density of the population rose from 4·28 in 1901 to 4·36 in 1911. During the year the Local Government Board sanctioned the borrowing of a loan for the erection of 32 houses. On further consideration the Council came to the conclusion that there would be a loss of about £1 per annum per house. The demand also for houses during the year has decreased. The scheme, therefore, has been abandoned for a time.

One hundred and forty-eight houses have been inspected under the Housing and Town Planning Act. Six were closed.

Two nuisances occurring during the year receive special mention. One was caused by a cesspool overflowing into a pond, and the other was also due to cesspools which either overflowed or were not watertight. The nuisances have been abated.

Premises under control of the Council are properly supervised.

During the year 28 cases of infectious disease have been notified: 2 scarlet fever, 6 erysipelas, 3 enteric fever, 2 puerperal fever, and 15 pulmonary tuberculosis.

ROMFORD.

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

Area in acres	...	5,630
Population, 1911 census ...	...	16,972
„ 1912, estimated	...	17,600
Deaths registered in the district	...	289
Corrections ... Additions	...	9
„ ... Deductions	...	121
Nett deaths	...	177

	1912.		Mean 1907-11.
Nett death rate	10·05	...	10·7
Infant mortality	84·4	. .	89·6
Birth rate	22·2	...	25·4

The population is of a varied class—local gentry, local and London business men, employees in brewery and in building trades, &c. The housing generally is satisfactory. There are two or three courts in the town with limited space and unsatisfactory surroundings. A considerable number of houses have been built on the Gidea Park Estate. The estate is being developed so as not to spoil the naturally picturesque character of the neighbourhood.

One hundred and thirty-three houses were inspected under the Housing and Town Planning Act. Six houses were found unfit for habitation, but no closing orders were made.

The district is mainly supplied by the South Essex Water Company. The supply is good and constant. The number of private wells is gradually diminishing.

The whole of the district, with the exception of Noak Hill, is sewered. The sewage is treated by broad irrigation on a large farm. Local drains occasionally give trouble. Water closets are general, but many are hand flushed. A proper cistern is provided as occasion offers.

House refuse is removed by the Council weekly in summer and fortnightly in winter. Some is taken to brickfields and some to disused gravel pits.

Premises under the control of the Council are well supervised.

The Inspector attends the market, and examines cattle and food exposed for sale. Where diseased, poor, or emaciated cattle are sold he obtains the name and address of the purchaser, and acquaints the Local Authority of the district into which the animals are taken.

A good deal of trouble is caused by gipsy encampments on unoccupied land. On four occasions proceedings were taken where the bye-laws were infringed, and the defendants were fined in each instance.

One hundred and forty-six cases of infectious disease have been notified: 19 diphtheria, 17 erysipelas, 57 scarlet fever, 3 enteric fever, 2 puerperal fever, 1 poliomyelitis, and 47 pulmonary tuberculosis.

SAFFRON WALDEN.

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

Area in acres	7,502
Population, 1911 census	6,311
„ 1912 estimated ...	6,352
Deaths registered in the district ...	83
Corrections ... Additions ...	5
„ ... Deductions ...	28
Nett deaths	60

	1912.	Mean 1907-11.
Nett death rate	9·4	... 12·0
Infant mortality	45·	... 92·
Birth rate	17·3	... 16·2

The Borough is in the Cam Valley on the chalk. The district is undulating, varying in level from 150 to 400 feet above O.D. There is no special industry.

The water supply is from a well in the chalk owned by the Council. The water is softened and filtered before distribution. Nearly all the houses in the town are supplied from this source, but 71 in the rural area are supplied from wells and a few from ponds.

The pressure afforded by the town service reservoir is not sufficient to carry an adequate supply of water to the houses situated in the upper part of the town. The Local Government Board have sanctioned a scheme whereby a cast iron tank will be erected 353 feet above O.D. This will give an increased pressure of 20 lbs. per square inch. Tenders have been invited to carry out this work.

The new system of sewerage and sewage disposal has been completed. The Local Government Board has sanctioned an additional loan of £2,500 for house connections. This work is now being carried out.

Most of the houses have water closets with flushing cisterns, but there are 19 pail closets and 175 privies nearly all of which are in the rural part.

Scavenging is undertaken by the Council and refuse is removed weekly, the D. card system being adopted. In most cases householders have provided sanitary dust-bins.

Three hundred and forty houses have been inspected under the Housing and Town Planning Act. Of these 2 were closed and 38 put in habitable repair.

Premises under control of the Council are well supervised.

During the year a Sanitary and Housing Inspector has been appointed. Previously the Surveyor held these offices.

Fifty-one cases of infectious disease have been notified : 16 diphtheria, 5 erysipelas, 24 scarlet fever, 1 puerperal fever, 5 pulmonary tuberculosis.

Several alterations and additions to the Isolation Hospital are under the consideration of the Board. The hospital serves the Borough and the Rural District.

SHOEBURYNESS.

Medical Officer of Health ... M. H. RAPER, M.D., D.P.H.

Area in acres	1,036
Population, 1911 census	5,006
,, 1912 estimated	5,075
Deaths registered in the district ...	34
Corrections ... Additions ...	9
,, ... Deductions ...	—
Nett deaths	43

	1912.	Mean 1907-11.
Nett death rate	8·4 ...	9·9
Infant mortality	70·1 ...	82·7
Birth rate	33·6 ...	33·5

The district consists of the town proper and the War Department property.

The water supply has been greatly improved. The Local Government Board sanctioned a loan of £2,300, and a new pumping plant has been installed, which is capable of raising 10,000 gallons per hour against 5,000 formerly raised. The supply will now be sufficient for the needs of the town for many years to come.

The town is drained by two main sewers at the east and west ends respectively. The sewage is conducted to tanks, and these are discharged at certain states of the tide.

House refuse is collected twice weekly, nearly all the houses have now got sanitary dustbins.

There is a big demand for houses, their general condition is good, many improvements having been effected during the last two years.

Dairies, bakehouses, etc., are periodically inspected, and are kept in a satisfactory condition.

No houses have been dealt with under the Housing and Town Planning Act, as all repairs and alterations have been completed during the years 1910 and 1911.

Fifty-four cases of infectious disease have been notified : 8 diphtheria, 7 erysipelas, 18 scarlet fever, 4 enteric fever, 1 cerebro-spinal meningitis, and 16 pulmonary tuberculosis. The district is combined with the Rochford Rural District for hospital purposes, and there is an isolation hospital at Sutton Ford.

SOUTHEND-ON-SEA.

Medical Officer of Health ... C. GRANT PUGH, M.D., B.Sc., D.P.H.

Area in acres	5,172
Population 1911 census	62,713
„ 1912 estimated... ...	67,284
Deaths registered in the district ...	619
Corrections ... Additions ...	94
„ ... Deductions ...	65
Nett deaths	648

	1912.		1907-11.
Nett death rate	9·6	...	11·0
Infant mortality	56·4	...	93·8
Birth rate	19·4	...	20·2

The death rate and the infant mortality rate are the lowest yet recorded. The town continues to grow rapidly, over 700 houses being erected during the year, and a census of the inhabited houses showed only 1·9 per cent. to be unoccupied.

The Town Planning Committee of the Council has commenced work so that supervision over new building estates will be provided.

The number of visitors to the town during the summer months is estimated at 30,000, and on occasions as many as 90,000 day trippers visit the borough.

Considerable attention has been paid to the brickfields in Prittlewell Ward. No nuisance is caused here now.

Deposits of refuse on vacant plots and in back passages continue to be a source of nuisance and annoyance; several prosecutions have been instituted with good effect. Some of the wider passages have been placed on the list of streets and are to be made up under the Private Street Works Act. If all passages were dealt with in this way the expense to owners would probably be excessive. The Medical Officer of Health advocates that each passage be dealt with as circumstances direct.

Free accommodation for women and children at some of the public conveniences is recommended. Owing to the large number of trippers the need is apparent.

Two hundred and fifty houses were inspected under the Housing and Town Planning Act, 3 were found to be unfit for human habitation; of these 2 were demolished and the third is now being used as a store.

There was a deficiency of £60 odd on the Council's houses in Ruskin Avenue. The capital charges however relate to all the land bought, some of which has not yet been built upon.

Premises and occupations which can be controlled by the Council are well supervised. A large proportion of the meat sold in the borough is either chilled or obtained from the London Meat Markets, it is probable therefore that a public abattoir would not be a profitable speculation. It is suggested that two or three small slaughterhouses should be erected by the Council and rented to the butchers, In this way the use of the existing slaughterhouses in the thickly populated parts of the town might be discontinued.

House refuse is removed by the Council's Staff once a week during the winter and twice weekly during the summer. The bi-weekly collection during the summer months was commenced during the year and has been much appreciated.

The refuse is disposed of at various tips but the new destructor is expected to be ready for use in the autumn of this year.

All the houses with the exception of a few on the outskirts are connected to the sewers. These have either pail closets or privies. The new sewage disposal works are nearing completion and are expected to be in use towards the end of the year. The new outfall will be 1½ mile below high water mark and 150 yards below low water mark.

The Shops Act, 1912, is administered by the Health Committee and the Sanitary Inspectors act also as Shop Inspectors.

The water supply is in the hands of a Public Company. During the summer of 1911, owing to increased consumption of water resulting from the very hot and dry weather, it became necessary to intermit the supply for a few hours each day. In order to prevent a recurrence of this difficulty the Company at once undertook some improvements, including the sinking of a new well and providing new storage reservoirs. The total storage will be twenty-four million gallons so that there is no likelihood that the constant supply which has been maintained during 1912 will not be continued in the future.

Five hundred and seven cases of infectious disease have been notified: 61 diphtheria, 38 erysipelas, 140 scarlet fever, 11 enteric fever, 7 puerpual fever, 1 cerebro-spinal meningitis, 1 poliomyelitis, 248 pulmonary tuberculosis.

The erection of the new nursing home and administrative block at the isolation hospital has been commenced, and will be completed during the course of the year.

One thousand eight hundred and eighty specimens were examined at the Borough Laboratory.

Of the 248 cases of pulmonary tuberculosis, 161 were either temporary visitors to the Borough or had taken up their residence there because they were already suffering from the disease.

TILBURY.

Medical Officer of Health ... A. H. FOWLER, M.R.C.S.

Area in acres	1,855
Population, 1911 census	6,432
,, 1912 estimated ...	7,000
Deaths registered in the district ...	48
Corrections ... Additions ...	16
,, ... Deductions ...	16
Nett deaths	48

	1912.	Mean 1907-11.
Nett death rate	6·8 ...	No record.
Infant mortality	45·8 ...	,,
Birth rate	18·6 ...	,,

By a Local Government Board Order which came into force on the 1st April, 1912, part of the Orsett Rural District (viz., Chadwell Civil Parish) was constituted Tilbury Urban District and divided into two wards.

The report deals with the latter nine months of the year, consequently the vital statistic figures are too low.

The most urgent matters before the Council are in connection with the drainage and housing in the Lower Ward, of Tilbury proper.

A scheme has been prepared whereby the Council propose to erect a number of cottages, the majority of which are to be in the Lower Ward. An inquiry into the matter is expected to be held shortly. Many of the present cottages are in an insanitary condition, and a large number are occupied by two tenants.

Bakehouses, cowsheds, &c., are stated to be in good condition.

Eighteen cases of infectious disease have been notified—four diphtheria, one erysipelas, ten scarlet fever, 1 enteric fever, two pulmonary tuberculosis.

WALTHAM HOLY CROSS.

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

Area in acres	11,017
Population, 1911 census	6,796
,, 1912 estimated ...	6,825
Deaths registered in the district ...	69
Corrections ... Additions ...	10
,, ... Deductions ...	11
Nett deaths	68

	1912.	Mean 1907-11.
Nett death rate	9·9 ...	11·2
Infant mortality	67·2 ...	91·3
Birth rate	17·4 ...	21·8

The water supply is from the Metropolitan Water Board's deep well in Lea Road. It has been abundant, constant, and pure.

Two hundred and sixty houses have been inspected under the Housing and Town Planning Act. Four were found unfit for human habitation and ten were closed.

The sewage disposal works continue to act satisfactorily. Action was taken against the Council for polluting Coppins Brook, a tributary of the Lea. A conviction resulted. It would appear that a surface drain from the land on which sludge was deposited discharged into the brook. This drain has been cut off.

The removal of house refuse is satisfactory, but it appears that a destructor would be of service.

A building known as the Post Office, and situated in the Market Square, has several times been reported upon as dilapidated, dangerous, and insanitary. The Medical Officer of Health urges that prompt action should be taken in this case.

Fifty-seven cases of infectious disease have been notified: 3 diphtheria, 2 erysipelas, 36 scarlet fever, 16 pulmonary tuberculosis. The district is in the Waltham Abbey Joint Hospital area.

WALTHAMSTOW.

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

Area in acres	4,343
Population, 1911 census	124,597
,, 1912 estimated ...	128,480
Deaths registered in the district ...	876
Connections ... Additions ...	413
,, ... Deductions ...	22
Nett deaths	1,267

	1912.	Mean 1907-11.
Nett death rate	9·8	10·9
Infant mortality	77·1	97·1
Birth rate	24·4	28·4

The vast majority of the inhabitants of this urban district is made up of families of working men who leave the district daily to work and return at night to sleep. It is one of London dormitories. An increasing amount of labour is being employed at local factories year by year. Only about 10 per cent. of the householders employ a domestic servant.

There is an abundance of five and six-roomed cottages letting at 7s. 6d. to 9s. per week, and flats of three to four rooms let at 5s. 6d. and 6s. per week. The houses generally are modern and convenient.

The water supply is from the Metropolitan Water Board's mains; it has been constant and abundant.

House refuse is collected by the Council's staff. It is removed three times per week in the shopping areas, and twice weekly in other parts of the district. The refuse is burnt in a destructor.

An agreement whereby the sewage from the district was to be taken into the Metropolitan Main Drainage system fell through owing to the action of one of the other authorities who were to participate in the scheme. The sewage works have given satisfactory results during the year, but it is hoped that the agreement may be effected in the near future.

Premises under the control of the Council are efficiently supervised.

Six hundred and eighty-seven houses have been inspected under the Housing and Town Planning Act.

The cases of infectious disease notified include 233 diphtheria, 287 scarlet fever, 13 enteric fever, 10 puerperal fever, 4 poliomyelitis, and 295 pulmonary tuberculosis. The district possesses an excellent Isolation Hospital at Chingford.

WALTON-ON-THE-NAZE.

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

Area in acres	2,046
Population 1911 census	2,172
,, 1912 estimated ...	2,192
Deaths registered in the district ...	24
Corrections ... Additions ...	3
,, ... Deductions ...	3
Nett deaths	24

	1912.	Mean 1907-11.
Nett death rate	10·9 ...	10·9
Infant mortality	93·0 ...	109·6
Birth rate	19·6 ...	18·9

Meteorological records have been kept since 1st August, and make very interesting reading. They show that Walton had a lower rainfall than that recorded at any other sea coast town in the Eastern District. The amount of sunshine is only beaten by one other seaside resort.

The housing accommodation generally is good; this is accounted for by the fact that many householders let apartments during the summer months.

The water supply from the Tendring Hundred Waterworks Company has been ample and good.

The sewage is collected in storage tanks, and is discharged into the sea on the night ebb tide.

House refuse is removed by a contractor. The new refuse tip on the marshes has proved satisfactory.

Premises under control of the Council are inspected from time to time, and are kept in a satisfactory condition.

The only cases of infectious disease notified were 6 of pulmonary tuberculosis.

During the year arrangements were made with the Borough of Colchester, whereby cases of infectious disease are to be admitted to the Borough Hospital.

WANSTEAD.

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

Area in acres	1,679
Population, 1911 Census	13,831
,, 1912 estimated ...	15,707
Deaths registered in the district ...	85
Corrections ... Additions ...	26
,, ... Deductions ...	5
Nett deaths	106

	1912.	Mean 1907-11.
Nett death rate	6·7 ...	8·0
Infant mortality	46·3 ...	56·5
Birth rate	16·4 ...	16·4

This residential area continues to develop. Many new houses have been built, and new roads have been made up. The open spaces known as Wanstead Park and Wanstead Flats have been secured against building operations, and this will no doubt preserve the residential character of the district.

The sewage farm which was formed 30 years ago is not now sufficient for the district. A new system consisting of percolating filters and travelling distributors is to be introduced. The work will be commenced in the spring.

Scavenging is by contract, and the house refuse is removed weekly. The carts used have only a tarpaulin cover. Proper covered carts should be provided.

The housing for the working classes in the district appears to be adequate. Sixty-six houses were inspected under the Housing and Town Planning Act, and six closing orders were made.

New office accommodation is required for the sanitary inspector.

The water is supplied by the Metropolitan Water Board. The supply is constant and of good quality.

Seventy-six cases of infectious disease were notified: 23 diphtheria, 3 erysipelas, 34 scarlet fever, 1 enteric fever, 1 puerperal fever, and 14 pulmonary tuberculosis.

WITHAM.

Medical Officer of Health ... K. GIMSON, M.B., B.C.

Area in acres	3,713
Population, 1911 census	3,480
,, 1912 estimated ...	3,483
Deaths registered in the district ...	47
Corrections ... Additions ...	7
,, Deductions ...	—
Nett deaths	54

	1912.	Mean 1907-11.
Nett death rate	15·5 ...	11·4
Infant mortality	50· ...	69·9
Birth rate	17·2 ...	18·2

The housing question here appears to be a difficult one. The district being purely agricultural, the majority of the poorer classes can only afford a small rent, and as cottages could not be built at a less rental than 3s. 9d. without increasing the rates, the Council have decided not to take any action in the matter. Sixty houses have been inspected under the Housing and Town Planning Act. No closing orders were made.

The water supply from deep wells has been constant and satisfactory in every way.

The sewerage system is not quite satisfactory. The sewers at one point overflow in wet weather. The sewage is treated by broad irrigation upon a small farm, which permits of an overflow into the river after heavy rain.

House refuse is removed weekly by the Council's men.

New bye-laws are required for dairies, cowsheds, etc., and for slaughterhouses, and with regard to nuisances.

There is no isolation hospital, but the provision of one is under consideration.

Eleven cases of infectious disease were notified: 6 diphtheria, 3 scarlet fever, and 2 enteric fever.

WIVENHOE.

Medical Officer of Health ... G. T. KEVERN, M.R.C.S., L.R.C.P.

Area in acres	1,564
Population, 1911 census	2,376
,, 1912 estimated ...	2,500
Deaths registered in the district ...	29
Corrections ... Additions ...	2
,, Deductions ...	—
Nett deaths	31

	1912.	Mean 1907-11.
Nett death rate	12·4 ...	9·4
Infant mortality	73·1 ...	94·5
Birth rate	16·4 ...	15·4

The water supply, which is from a deep well in the chalk, is excellent and plentiful.

Pail closets are in general use, and these and the house refuse are scavenged by the Council's men. There are some privies and cesspools. Most of the houses drain into a small tributary of the Colne, and others drain direct to the river.

Food exposed for sale is inspected, and dairies and milkshops visited at frequent intervals.

Eighteen cases of infectious disease were notified: 1 diphtheria, 2 erysipelas, 4 enteric fever, and 11 pulmonary tuberculosis.

There is no isolation hospital, but cases can be sent to Colchester Hospital.

WOODFORD.

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

Area in acres	2,161
Population, 1911 census	18,497
,, 1912 estimated ...	19,075
Deaths registered in the district ...	139
Corrections ... Additions ...	44
,, ... Deductions ...	6
Nett deaths	177

	1912.	Mean 1907-11.
Nett death rate	9·2 ...	9·1
Infant mortality	81·6 ...	74·8
Birth rate	18·6 ...	22·3

The greater part of this residential district is on a ridge between the Rivers Lee and Roding.

Housing accommodation is on the whole satisfactory. Drainage in many of the older houses is not satisfactory, and requires frequent supervision. Three hundred and fifty-one houses were inspected under the Housing and Town Planning Act, and two were closed and demolished.

The water supply from the Metropolitan Water Board is good and constant.

House refuse is collected by a contractor once a week, and on the whole the collection is done satisfactorily.

The sewerage system continues to give satisfactory results, but in the low lying parts of the district after a heavy storm the water and sewage flows back up the drain and floods the courts at the back of the houses.

The ponds of stagnant water which have been previously reported upon by the Medical Officer of Health were not a nuisance during the year owing to there being sufficient rain to keep them full. The ponds are sprayed once a week with paraffin in order to destroy the gnats which bred in them.

Premises under the supervision of the Council are effectively controlled.

Ninety-five cases of infectious disease were notified: 15 diphtheria, 10 erysipelas, 36 scarlet fever, 1 enteric fever, 33 pulmonary tuberculosis. Woodford is in the area served by the Waltham Isolation Hospital.

III. RURAL DISTRICTS.

BELCHAMP.

Medical Officer of Health ... T. SINCLAIR HOLDEN, M.D.

Area in acres	26,500
Population, 1911 census	4,676
„ 1912 estimated ...	4,686
Deaths registered in the district ...	55
Corrections ... Additions ...	12
„ ... Deductions ...	—
Nett deaths	67

	1912.	Mean 1907-11.
Nett death rate	14·2 ...	13·9
Infant mortality	71·4 ...	63·9
Birth rate	17·9 ...	18·1

The housing in the district is about adequate. A Sub-Committee of the Council inspected the Parishes of Foxearth, Pentlow, Borley and Gestingthorpe, as the Medical Officer of Health reported in 1911 that the housing accommodation in these parishes was inadequate. Several new cottages are being built, and others put into habitable repair, so it would seem that the conditions are improved. Three hundred and eighty-two cottages were inspected under the Housing and Town Planning Act. Five houses were demolished.

Water supply is from wells and springs. There are 10 public wells. Eleven samples of water were analysed, and 6 were found to be impure.

Privy cesspits are gradually being abolished and pail closets substituted. There is no pollution of any of the streams in the district. Sewers exist in a few of the larger villages; they are used for slop and storm water only. The Foxearth Brewery sewage is treated chemically with satisfactory results.

Systematic inspections are made. There are four district nurses for six parishes. More are required.

Thirteen cases of infectious disease were notified: 5 scarlet fever, 1 erysipelas, and 7 pulmonary tuberculosis.

BILLERICAY.

Medical Officer of Health ... J. DOUGLAS WELLS, M.B., CH. B.

Area in acres	49,394
Population, 1911 census	21,557
„ 1912 estimated	Figures not stated.
Deaths registered in the district ...	552
Corrections ... Additions ...	9
„ .. Deductions ...	315
Nett deaths	246

	1912.	Mean 1907-11.
Nett death rate	11·4 ...	11·0
Infant mortality	46·9 ...	65·5
Birth rate	17·7 ...	24·0

The nett number of deaths given in the report is 197, and death rate 9·1. The Medical Officer of Health finds that the returns from the Registrar-General and the local Registrars do not correspond, and he has adopted the figures supplied by the latter. If the former figures were adopted, the nett deaths would number 246, and the nett death rate would be 11·4.

The main water supply to the district is from two sources, the South Essex and the Southend Water Companies. Other parts of the district get their supply from shallow wells, some of which are polluted. This is especially marked in the Parishes of Ingrave and East Horndon. Water mains have been extended at Childerditch, Little Warley, and in South Weald.

One hundred cottages were inspected under the Housing and Town Planning Act, and 14 representations were made to the Local Authority with a view of closing orders being made. Only two orders were made, as it was considered more could not be closed owing to the absence of cottages for the tenants from the condemned cottages to go to. Seven cottages are being built in Great Burstead parish and six in Ramsden Bellhouse parish by the Authority.

The sewage scheme for Billericay will shortly be completed. The Medical Officer regrets that the sewers when being laid were not extended up some private roads where there are many houses. The question of a sewerage scheme for Ingrave and East Horndon parishes is again advocated.

Premises supervised by the Council receive attention. There are many dairy farms in the district, and the conditions under which the industry is carried on show improvement.

The notifications during the year include: 28 diphtheria, 31 scarlet fever, 8 enteric fever, 1 puerperal fever, 1 poliomyelitis, and 37 pulmonary tuberculosis.

BRAINTREE.

Medical Officer of Health ... H. G. K. YOUNG, B.A., M.R.C.S., L.R.C.P.

Area in acres	62,348
Population, 1911 census	18,463
,, 1912 estimated ...	Figures not stated.
Deaths registered in the district ...	283
Corrections ... Additions ...	15
,, Deductions ...	14
Nett deaths	284

	1912.	Mean 1907-11.
Nett death rate	15·3 ...	13·5
Infant mortality	78·6 ...	82·9
Birth rate	17·2 ...	18·5

The need for more cottages becomes more insistent year by year. At present it is not possible to deal with all the defective and uninhabitable cottages as there are no available cottages for the tenants to occupy.

The Coggeshall Waterworks continue to give an ample supply to the district concerned. Medicinal properties are attributed to the water. The Bocking Waterworks have been completed, and the houses in the area supplied are being connected up. Not much progress has been made with regard to a supply for Hatfield Peverel.

There are no extensive sewage works in the district, but a small scheme to deal with the sewage from the village of Kelvedon is under construction.

Inspections of the premises under the control of the Council are carried out.

Eighty-eight cases of infectious disease were notified: 16 diphtheria, 9 erysipelas, 38 scarlet fever, 4 enteric fever, 21 pulmonary tuberculosis.

BUMPSTEAD.

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

Area in acres	11,874
Population, 1911 census	2,594
,, 1912 estimated ...	2,599
Deaths registered in the district ...	34
Corrections ... Additions ...	11
,, Deductions ...	—
Nett deaths	45

	1912.	Mean 1907-11.
Nett death rate	17·3 ...	14·3
Infant mortality	66· ...	118·
Birth rate	23·1 ...	21·8

This small rural district lies in the valley of the Colne and the Stour, the soil being chiefly Boulder Clay overlying the Chalk. The chief employment is agriculture, but a few of the inhabitants are engaged in making up clothing for a factory outside the district.

There are public water supplies in four parishes out of the six in the district. In no instance is the supply piped.

There is no proper system of sewers. At Sturmer there is a short pipe which terminates in tanks which are periodically cleaned out, the overflow passing into the Stour. At Steeple Bumpstead sewage from a group of houses passes through a filter and then into the Colne. At Birdbrook several houses drain into a sewer discharging into the Colne. Most of the cottages have sufficient garden for the disposal of slop water.

There is no public scavenging of any kind.

Sixty-nine houses were inspected under the Housing and Town Planning Act and 6 were closed.

Inspections are made of all premises under the control of the Council.

Twenty-two cases of infectious disease were notified: 14 diphtheria, 3 erysipelas, 2 scarlet fever, and 3 pulmonary tuberculosis.

CHELMSFORD.

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

Area in acres	83,045
Population, 1911 census	22,792
,, 1912 estimated ...	23,080
Deaths registered in the district ...	232
Corrections ... Additions ...	47
,, ... Deductions ...	6
Nett deaths	273

	1912.	Mean 1907-11.
Nett death rate	11·8 ...	12·6
Infant mortality	73·5 ...	81·5
Birth rate	22·4 ...	21·5

This is a prosperous agricultural district in the centre of the county, surrounding the still more prosperous County Town. Many of the artizans employed in the Borough reside in the rural district, and this has seriously affected the housing problem. The Council contemplate building eight pairs of cottages in three parishes

There are waterworks owned by the Council at Writtle, Danbury, Ingatestone and Great Baddow. All are kept in an efficient and satisfactory condition. One or two parishes have a very deficient water supply, but a feasible scheme has not yet been devised. The work in connection with the water supply to Broomfield is well in hand.

The various sewage works have acted satisfactorily during the year, but the filter beds at the Writtle works require renewing. Great Baddow and Widford drain into the Borough sewers. Pollution of the Chelmer takes place at Broomfield and Little Waltham. The former will be sewered shortly, and a scheme for the latter requires consideration. Several pollutions from farms and houses have been dealt with.

Pail closets are in general use, but there are many water closets in areas with a proper water supply. Privies with large cesspits are gradually disappearing.

House refuse is removed by contractors in three parishes. Trouble has arisen owing to the contractor not using a properly covered cart. Scavenging of the populous parts of Writtle parish is desirable, but is objected to by the Parish Council.

Premises under the control of the Council are well supervised.

Three hundred and four cottages were inspected under the Housing and Town Planning Act, and two closing orders were made.

One hundred and twelve cases of infectious disease were notified during the year: 23 diphtheria, 7 erysipelas, 41 scarlet fever, 2 enteric fever, and 39 pulmonary tuberculosis.

DUNMOW.

Medical Officer of Health ... E. E. GOODBODY, M.D., D.P.H.

Area in acres	...	73,503
Population, 1911 census ...	...	16,084
„ 1912 estimated	...	16,136
Deaths registered in the district	...	222
Corrections ... Additions	...	11
„ ... Deductions	...	4
Nett deaths	...	229

	1912.		Mean 1907-11.
Nett death rate	14·1	...	14·3
Infant mortality	68·5	...	74·8
Birth rate	19·8	...	21·9

The district drains into the rivers Chelmer, Blackwater and Roding. The greater part of the population are engaged in agriculture. There is a bacon factory in Dunmow, which is the largest town in the district.

During the year the Council purchased the waterworks at Dunmow and Felstead. Hatfield Broad Oak is supplied by a company obtaining its supply from the Herts and Essex Waterworks, the remaining parts of the district depends upon public and private wells and springs for a supply. Thaxted is about to have a public supply, and Great Bardfield would benefit by one.

In the Parishes of Dunmow, Thaxted, Great Bardfield, Stebbing, Felstead, High Easter, Takeley, Hatfield Broad Oak and Great Easton, road drains have been converted into sewers, all of which discharge into ditches or streams. The Chelmer is much polluted at Thaxted and Dunmow, and some pollution of the Pant occurs at Gread Bardfield.

Sewage disposal schemes for Dunmow and Thaxted are under consideration.

Premises under control of the Council are properly supervised.

One hundred and twelve cases of infectious disease were notified: 11 diphtheria, 14 erysipelas, 35 scarlet fever, 9 enteric fever, 3 puerperal fever, and 40 pulmonary tuberculosis. There is an isolation hospital in the district.

EPPING.

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

Area in acres	36,705
Population, 1911 census	13,959
,, 1912 estimated ...	13,988
Deaths registered in the district ...	114
Corrections ... Additions ...	27
,, ... Deductions ...	—
Nett deaths	141

	1912.	Mean 1907-11.
Nett death rate	11·9 ...	11·1
Infant mortality	44·7 ...	70·5
Birth rate	19·2 ...	20·0

An agricultural and residential district containing a considerable proportion of forest land.

A great part of the area is supplied by the Metropolitan Water Board and the Herts and Essex Co. Both supplies are on the intermittent system, and the quality of the water is very good, although it is somewhat hard. Mains have been laid through Middle Street, Nazeing, during the year. Further extensions are required.

Pollutions of the Stort and Lee took place at Harlow, Potter Street, and Roydon. These have now been removed.

Separate sewage works have been completed during the year at Roydon, Potter Street, Thornwood, and Weald Gullett.

House refuse is periodically removed at Harlow, Netteswell, Potter Street, and Chigwell. No arrangement has yet been made for public scavenging at Theydon Bois, and which is much required.

Premises under the control of the Council are efficiently supervised. Two hundred and thirty-four houses were inspected under the Housing and Town Planning Act.

Eighty-eight cases of infectious disease were notified during the year: 18 diphtheria, 12 erysipelas, 38 scarlet fever, and 19 pulmonary tuberculosis. There is an isolation hospital used jointly by the urban and rural districts.

HALSTEAD No. 1.

Medical Officer of Health ... J. W. ASHWORTH, M.D.

Area in acres	...	18,200
Population, 1911 census ...	...	4,704
„ 1912 estimated	...	4,747
Deaths registered in the district	...	41
Corrections ... Additions	...	6
„ ... Deductions	...	—
Nett deaths	...	47

	1912.	Mean 1907-11.
Nett death rate	9·09 ...	11·3
Infant mortality	39· ...	65·4
Birth rate	16· ...	19·2

The water supplies, chiefly from shallow wells, are satisfactory, save in Earls Colne and parts of White Colne and Colne Engaine. A scheme has been adopted and will shortly be in operation for the supply of this part.

Privy cesspits and earth closets are in vogue in the district. Ditches which receive sewage are periodically cleaned out. At Earls Colne the river is polluted by crude sewage and some improvement is required here. No public scavenging is undertaken by the Council.

Nine Closing Orders were issued during the year and in all cases the cottages were put into habitable repair. Forty-one cottages were repaired upon representation being made to the owners.

Premises under the control of the Council are properly supervised.

Two cases of diphtheria, 8 of scarlet fever, 2 of enteric fever, and 6 pulmonary tuberculosis were notified during the year.

HALSTEAD No. 2.

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

Area in acres	20,512
Population, 1911 census	5,628
,, 1912 estimated ..	Figures not given.
Deaths registered in the district ...	73
Corrections ... Additions ...	8
,, Deductions ...	—
Nett deaths	81

	1912.		Mean 1907-11.
Nett death rate	14·3	...	11·9
Infant mortality	83·3	...	65·7
Birth rate	21·3	...	20·8

The water supply is almost entirely from wells, some of which are not satisfactory. At Castle Hedingham the sewer has been extended. Sewers and sewer ditches are regularly flushed and cleansed.

Privy cesspits are gradually diminishing, while both water closets and pail closets are increasing.

There is no system of scavenging in any part of the district.

Thirteen closing orders were made, and in 12 cases the house was put into habitable repair.

Building bye-laws and bye-laws relating to drainage appear to be required.

One case of diphtheria and one case of puerperal fever were notified during the year.

LEXDEN AND WINSTREE.

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

Area in acres	69,485
Population, 1911 census	19,686
,, 1912 estimated ...	19,876
Deaths registered in the district ...	227
Corrections ... Additions ...	14
,, Deductions ...	4
Nett deaths	237

	1912.		Mean 1907-11.
Nett death rate	12·02	...	12·3
Infant mortality	46·9	...	63·8
Birth rate	20·3	...	20·8

A considerable portion of this district is on the London clay, consequently the water supply is a difficult one. Most of the inhabitants are engaged in agriculture, but there are seafaring people at East Donyland and Mersea.

Rowhedge has a public water supply, and this is the only one belonging to the Council. Part of Stanway is supplied from the Colchester mains. The remainder of the district is chiefly supplied from shallow wells, and many of these are not properly constructed. The scheme which was under the consideration of the Council for the supply of Abberton, Langenhoe, Messing, Salcot, Virley, and West Mersea has been abandoned.

The village of Dedham is the only place which is properly sewered in the district. There are sewers in several other parishes discharging into ditches or tidal water. Several other places have been recommended for several years by the Medical Officer of Health as requiring a proper sewage system, and as the matter has received very little attention it is not again repeated in this year's report.

There are many privies of the old-fashioned type in the district. Great difficulty is found in getting people to use dry earth in pail closets.

At Rowhedge and West Mersea scavenging is done by a contractor. Many "dirt-holes" are used as a means of disposal of house refuse. The use of sanitary dust bins is strongly recommended.

In almost every parish more cottages are required; 6 to 8 is the number stated to be necessary. Two hundred and nineteen houses were inspected under the Housing and Town Planning Act, and three closing orders were made. Complaint is made that new houses are built without proper drainage.

Premises under the control of the Council are visited and supervised. Ninety three cases of infectious disease were notified: 3 diphtheria, 8 erysipelas, 34 scarlet fever, 4 enteric fever, 2 puerperal fever, 42 pulmonary tuberculosis. Cases of scarlet fever, diphtheria and enteric fever are, by arrangement, removed to Colchester Isolation Hospital when necessary. The expense, however, is great, and a hospital for the district is recommended.

MALDON.

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

Area in acres	82,342
Population, 1911 census	16,164
,, 1912 estimated ...	16,300
Deaths registered in the district ...	196
Corrections ... Additions ...	32
,, ... Deductions ...	3
Nett deaths	225

	1912.	Mean 1907-11.
Nett death rate	13·8 ...	12·3
Infant mortality	67·4 ...	67·9
Birth rate	20·9 ...	22·1

There are a few populous parishes in the district, but a good deal of the area is thinly populated. Most of the inhabitants are engaged in agriculture. At Tollesbury and Bradwell there are fishermen and yachtsmen, and at Heybridge there are large ironworks.

There are three public water works with mains ramifying through 12 parishes In other parts of the district there are deep wells with pumps owned and maintained by the Council. Very much progress has not been made with the scheme at Tollesbury, but full particulars are being prepared for presentation to the Local Government Board. At Heybridge the work of laying the mains has been completed, and houses are being connected up.

The sewage works at Latchingdon, Tollesbury and Tolleshunt D'Arcy have acted satisfactorily, and given rise to no complaint. New sewers have been laid at Southminster.

Pail closets are in general use, and privy cesspits are "converted" as occasion arises.

Public scavenging is carried out by contractors at Tolleshunt D'Arcy, Heybridge Basin, Southminster and Tollesbury. A scavenger is to be appointed at Heybridge.

One thousand and seventy-seven houses were inspected under the Housing and Town Planning Act. Nine closing orders were made and 4 cottages closed.

Premises under control of the Council are well supervised. A special report on the cowsheds in the district is incorporated in the report.

The Medical Officer of Health recommends that an Assistant Sanitary Inspector be appointed to help the Inspector who is also the Surveyor.

Fifty-six cases of infectious disease were notified: 12 diphtheria, 4 erysipelas, 21 scarlet fever, 4 poliomyelitis, and 15 pulmonary tuberculosis. About half the district is in the area of the Maldon Joint Hospital Board. The question of hospital accommodation for the remaining portion is under consideration.

ONGAR.

Medical Officer of Health ... A. S. DAVID, M.R.C.S., L.R.C.P., D.P.H.

Area in acres ...	...	...	47,236
Population, 1911 census ...		...	10,647
,, 1912 estimated...		...	10,700
Deaths registered in the district		...	98
Corrections ...	Additions	...	6
,, ...	Deductions	...	—
Nett deaths ...	...	...	104

	1912.	Mean 1907-11.
Nett death rate	9·7 ...	—
Infant mortality	62·2 ...	71·6
Birth rate	19·7 ...	21·1

This is a purely agricultural district. The Herts. and Essex Water Co. supply the parishes of Chipping Ongar, Bobbingworth, Greensted, Lambourne, and parts of Stanford Rivers. Shallow wells and occasionally ponds are utilized elsewhere.

There are sewers and sewage works at Chipping Ongar and Abridge. The effluent flows into the Roding. Toot Hill is sewered, and the sewerage of High Ongar and Blackmore is under consideration.

The only place scavenged in the district is Chipping Ongar, the refuse being destroyed in a kiln at the sewage works.

Two hundred and fifty-three houses were inspected under the Housing and Town Planning Act, six closing orders were made.

Slaughterhouses, cowsheds, bakehouses, etc., are efficiently supervised.

Two cases of diphtheria, 7 of scarlet fever, 1 puerperal fever, and 12 pulmonary tuberculosis were notified. There is no isolation hospital but the Council possesses tents, sheds, etc., which could be used in an emergency, and send some cases to London.

ORSETT.

Medical Officer of Health ... W. ALLINGHAM, M.R.C.S., L.R.C.P., L.S.A.

Area in acres	38,084
Population, 1911 census	24,874
„ 1912 estimated ...	18,445
Deaths registered in the district ...	210
Corrections ... Additions ...	14
„ ... Deductions ...	42
Nett deaths	182

	1912.	Mean 1907-11.
Nett death rate	9·8 ...	11·7
Infant mortality	56· ...	97·9
Birth rate	23·2 ...	27·3

During the year the parish of Chadwell-St.-Mary was constituted the Tilbury Urban District and was separated from the Rural District.

The South Essex and Southend Water Co. have mains in the district and supply most of the parishes. Artesian wells supply Bulphan and parts of North and South Ockendon.

At Stanford-le-Hope a new sewage system is being constructed. In other parts of the district there are sewers discharging into ditches. Public scavenging is undertaken at Chadwell, Aveley, North and South Ockendon, West and Little Thurrock, Stifford, and Stanford-le-Hope.

The disposal of sewage at West Thurrock, South Stifford, and Purfleet, continues to give rise to trouble. It is suggested that a Joint Sewerage Board should be formed to deal with the drainage of all the riverside parishes. (This has since been formed.)

Three hundred and fifty cottages have been inspected under the Housing and Town Planning Act, 5 have been closed.

More cottages are required in the district especially at Orsett and Langdon Hills.

The condition of premises under the control of the Council is said to be generally good.

Ninety-nine cases of infectious disease were notified: 10 diphtheria, 4 erysipelas, 46 scarlet fever, 14 enteric fever, and 25 pulmonary tuberculosis. Thirteen of the cases of enteric fever occurred in West Thurrock and Purfleet during July and August. The source of inspection was not discovered.

There is an Isolation Hospital at Grays for the joint use of the rural district and the town of Grays.

ROCHFORD.

Medical Officer of Health ... M. H. RAPER, M.D., D.P.H.

Area in acres	55,386
Population, 1911 census	18,399
,, 1912 estimated ...	18,550
Deaths registered in the district . .	235
Corrections ... Additions ...	10
,, ... Deductions ...	67
Nett deaths	178

	1912.		Mean 1907-11.
Nett death rate	9·5	...	11·7
Infant mortality	59·8	...	80·1
Birth rate	20·7	...	24·9

The district includes a large area of marsh land and a number of islands, separated by creeks of tidal water. Malaria used to be common in the district, but is now practically extinct.

Benfleet, Rayleigh, Hadleigh, Rochford, and the villages of Hawkwell and Hockley are supplied from a deep well owned by the Council at South Benfleet.

Great Wakering is supplied by the Southend Water Company. Most of the other parishes depend upon shallow wells.

The sewage tanks at South Benfleet have been enlarged and improved. A considerable quantity of cast iron sewer had to be re-laid at Rayleigh owing to breakages.

There is public scavenging in the parishes of Rochford, Rayleigh, Great and Little Wakering, Hadleigh, South Benfleet, and Great and Little Stambridge.

Numerous new cottages have been erected. Three hundred and thirteen were inspected under the Housing and Town Planning Act, and 6 closing orders were made.

Premises under the control of the Council are efficiently supervised.

Twenty-eight cases of diphtheria, 29 of scarlet fever, 8 of enteric fever, and 33 of pulmonary tuberculosis were notified during the year.

ROMFORD.

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

Area in acres	...	29,720
Population, 1911 census ...	...	25,361
,, 1912 estimated	...	26,000
Deaths registered in the district	...	214
Corrections ... Additions	...	45
,, ... Deductions	...	5
Nett deaths	...	254

	1912.		Mean 1907-11.
Nett death rate	9·7	...	10·5
Infant mortality	71·7	...	88·6
Birth rate	22·3	...	25·7

The housing in this populous district is fairly good, but new cottages are required in several parishes, viz., Hornchurch, Upminster, Dagenham, Rainham and Wennington. Two thousand three hundred houses were inspected under the Housing and Town Planning Act, and 2 closing orders were made.

The whole of the district, save a few localities far from the mains, is supplied by the South Essex Water Company. The supply is wholesome and constant.

Most of the villages are sewered, and have sewage disposal works of a more or less satisfactory character. Cesspools are periodically emptied by the Council's "motor cesspool engine," and pail closets are emptied weekly by contractors.

House refuse is removed weekly by contractors, and sanitary bins are required to be provided.

Premises and trades under the control of the Council are supervised, but the offensive trades at Rainham and Hornchurch often give rise to nuisance. New bye-laws have been approved by the Local Government Board, and when enforced may help to improve matters.

The reports of the Medical Officer of Health and Inspector *re* infectious disease and nuisances are very full.

The cases of infectious disease notified included 24 diphtheria, 42 scarlet fever, 1 enteric fever, 4 puerpural fever, 1 poliomyelitis, and 44 pulmonary tuberculosis. There is an excellent isolation hospital, used jointly by the urban and rural districts.

SAFFRON WALDEN.

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

Area in acres	59,975
Population, 1911 census	10,812
,, 1912 estimated ...	10,815
Deaths registered in the district	129
Corrections ... Additions ...	30
,, Deductions ...	2
Nett deaths	157

	1912.	Mean 1907-11.
Nett death rate	14·1 ...	14·0
Infant mortality	59· ...	70·6
Birth rate	18·8 ...	20·7

An agricultural district chiefly in the Cam valley.

The water supply is chiefly from the chalk, and a short summary is given of the water supply to each parish. Pond and surface water supplies are fairly numerous.

At Wimbish a new well has been sunk, and a pump, windmill, tank, &c., provided. At another place in the same parish a spring has been enclosed and a pump fixed. Both these works have been presented to the Council by the proprietors.

At Sheepcote Green, in the parish of Clavering, a new supply has been provided by the Council.

Rickling, Quendon, Newport, and Great Chesterford have sewers, but the two latter pollute the Cam. There are many privy cesspits in the district, but these are gradually being converted into pail closets.

Scavenging is only undertaken at Great Chesterford, but the Council have under consideration the question of scavenging the village of Littlebury.

Premises under the control of the Council are regularly inspected.

One hundred and nineteen houses were inspected under the Housing and Town Planning Act, and seven closing orders were made. The question of the Council building new cottages has been adjourned for six months.

Seventy-six cases of infectious disease were notified: 25 diphtheria, 1 erysipelas, 42 scarlet fever, 1 puerperal fever, 1 poliomyelitis, 6 pulmonary tuberculosis.

There is a joint hospital at Saffron Walden for the use of the Borough and the rural district.

STANSTED.

Medical Officer of Health ... R. A. DUNN, M.D., D.P.H., D.HY.

Area in acres	22,954
Population, 1911 census	7,066
,, 1912 estimated ...	7,084
Deaths registered in the district ...	62
Corrections ... Additions ...	29
,, .. Deductions ...	1
Nett deaths	90

	1912.	Mean 1907-11.
Nett death rate	12·7 ...	12·9
Infant mortality	65·2 ...	73·4
Birth rate	18·3 ...	—

Stansted is supplied with water by a private water company. All other villages are supplied from wells, chiefly of the shallow variety.

Stansted is the only village which is sewered. The Liernur system has been adopted, and a satisfactory effluent has been obtained.

During the year the Parochial Committee have undertaken the scavenging of Stansted.

Three hundred houses have been inspected under the Housing and Town Planning Act, and 6 houses were found unfit for human habitation.

Cowsheds, bakehouses, slaughterhouses, etc., are fairly well kept.

Seventeen cases of infectious disease have been notified: 3 diphtheria, 8 erysipelas, 1 enteric fever, and 5 pulmonary tuberculosis. There is an Isolation Hospital which also serves four Hertfordshire districts.

TENDRING.

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

Area in acres	73,131
Population, 1911 census	21,960
„ 1912 estimated ...	22,181
Deaths registered in the district ...	277
Corrections ... Additions ...	25
„ ... Deductions ...	23
Nett deaths	279

	1912.	Mean 1907-11.
Nett death rate	12·5 ...	12·5
Infant mortality	90·9 ...	82·6
Birth rate	19·8 ...	21·5

There is a considerable malting trade in this district, but the inhabitants generally belong to the agricultural classes. There are seafaring men in the villages on the coast.

The Tendring Hundred Water Co. supplies several parishes, and the mains are being extended to Dedham and Ardleigh. Part of Great Bentley is supplied from the Clacton mains, but an extension is highly desirable. Water is much wanted at Little Holland, Weeley, and Great and Little Oakley, all of which places are in the Tendring Water Company's area.

The are several schemes for sewering various parts of the district which have been considered by the Council, but nothing has as yet been done.

Pail closets are most common. There are many hand flushed closets, which are often found in an objectionable state.

Scavenging is undertaken in Manningtree, Lawford, Mistley, and Parkeston. It is done weekly or oftener. "Dirt holes" are common in the more rural parts of the district. Provision of portable closets with ashbins is advocated.

Three hundred and sixty-one houses have been inspected under the Housing and Town Planning Act. More cottages are required in almost every parish in the district.

Premises under the control of the Council are efficiently supervised.

Seventy-four cases of infectious disease were notified: 10 diphtheria, 3 erysipelas, 18 scarlet fever, 6 enteric fever, 2 poliomyelitis, and 35 pulmonary tuberculosis.

Cases of infectious diseases can by arrangement be sent to Colchester Isolation Hospital, but the expense is heavy. The Medical Officer of Health advocates an isolation hospital for the district.

TABLE A.

DEATHS IN EACH DISTRICT CLASSIFIED ACCORDING TO DISEASES.

Corresponding to Table III. of the Local Government Board.

1912.

Names of Localities.	Enteric Fever.	Small-pox.	Measles.	Scarlet Fever.	Whooping Cough.	Diphtheria and Croup.	Influenza.	Erysipelas.	Phthisis. (Pulmonary Tuberculosis)	Tuberculous Meningitis.	Other Tuberculous Diseases.	Cancer, Malignant Disease.	Rheumatic Fever.	Meningitis.	Organic Heart Disease.	Bronchitis.	Pneumonia (all forms).	Other Diseases of Respiratory Organs.	Diarrhœa and Enteritis.	Appendicitis and Typhlitis.	Cirrhosis of Liver.	Alcoholism.	Nephritis and Bright's Disease.	Puerperal Fever.	Other Accidents and Diseases of Pregnancy and Parturition.	Congenital Debility and Malformation including Premature Birth.	Violent Deaths excluding Suicide.	Suicides.	Other Defined Diseases.	Ill-defined or Unknown.	All Causes.	Sub-Entries: Cerebro-Spinal Meningitis.	Sub-Entries: Poliomyelitis.
URBAN.																																	
Barking ...	1	...	1	..	14	2	5	2	23	3	5	23	5	2	43	25	36	2	5	1	2	1	8	3	1	42	9	...	59	2	330	...	...
Braintree	...	...	...	...	...	...	...	...	8	1	1	2	...	1	8	7	1	...	...	...	1	..	3	...	1	5	3	1	49	...	92	...	...
Brentwood	...	...	...	...	...	...	3	...	2	...	1	6	1	1	6	4	1	...	...	1	...	...	3	...	...	1	...	...	13	4	43	...	...
Brightlingsea	...	1	...	...	...	...	...	...	2	...	...	6	...	...	6	4	1	...	...	...	...	...	...	...	...	2	2	1	26	...	65	...	...
Buckhurst Hill	...	1	...	2	...	...	...	...	4	...	...	9	1	...	8	2	1	3	1	...	...	...	...	...	...	1	2	...	10	...	45	...	...
Burnham ...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	7	4	1	1	..	...	...	...	...	...	...	2	1	...	22	...	45	...	...
Chelmsford	...	...	...	1	2	1	...	...	10	2	3	19	...	...	16	12	3	...	..	1	3	...	11	...	2	16	7	2	63	3	177	...	...
Chingford	...	1	...	1	...	1	3	...	3	4	1	8	...	...	5	7	3	1	...	1	1	...	2	...	...	1	1	1	18	8	82	...	...
Clacton ..	...	...	...	...	3	...	1	...	8	1	1	7	1	1	...	3	6	1	...	1	2	...	6	...	...	5	3	...	39	2	94	...	...
Colchester	...	1	...	5	...	1	3	2	39	7	9	47	1	...	64	32	27	4	3	4	8	1	11	1	3	27	14	2	151	3	470	...	...
East Ham	...	3	...	39	7	39	9	15	1	103	18	69	107	14	7	126	137	105	23	32	4	14	1	57	3	8	114	63	5	541	10	1474	2	...
Epping ...	...	...	...	1	...	...	...	2	...	2	...	...	4	...	...	6	6	3	...	...	...	...	...	...	...	...	2	...	1	16	...	37	...	...
Fenton ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	1	...	...	1	...	...	1	...	2	...	...
Grays ...	...	...	1	...	6	3	...	3	10	6	4	15	1	2	7	15	11	...	3	...	3	1	5	...	...	9	5	...	34	19	163	...	...
Halstead	...	...	...	...	...	...	...	...	7	...	...	12	...	...	2	3	3	...	1	1	2	...	3	2	...	3	2	...	13	10	65	...	...
Harwich	...	1	...	5	...	8	2	...	6	5	5	12	1	5	18	10	8	5	1	1	2	...	7	...	1	16	2	2	40	...	163	...	...
Ilford ...	...	...	4	1	16	5	7	3	43	12	13	75	1	...	82	34	36	9	10	...	3	..	22	3	2	39	16	6	108	91	641	...	...
Leigh-on-Sea	...	...	...	...	...	2	1	...	7	1	4	9	2	1	14	2	2	1	1	...	...	...	1	...	1	7	5	..	30	6	96	...	...
Letton ...	4	...	12	4	38	22	9	1	115	20	24	93	4	..	...	129	112	14	31	2	14	1	54	5	6	99	42	4	482	1	1342	...	...
Loughton ...	...	...	...	...	...	...	1	...	5	1	...	6	...	1	7	2	4	2	3	1	...	...	2	...	1	5	1	2	33	...	88	...	...
Maldon ...	1	...	1	...	2	...	...	...	7	...	...	10	...	...	17	5	1	...	...	...	...	...	2	...	1	12	3	...	49	...	177	...	...
Romford ...	1	...	...	3	4	1	...	...	13	4	7	16	...	...	28	9	15	1	2	1	1	1	5	1	...	2	1	...	23	...	60	...	...
Saffron Walden	...	...	...	...	2	1	...	...	3	...	...	10	1	1	5	7	1	2	...	...	...	...	1	...	1	9	3	...	10	6	43	...	...
Shoeburyness	...	...	2	...	...	...	...	...	3	...	...	1	...	1	1	2	...	1	...	...	1	3	2	2	...	4	2	...	17	3	68	...	...
Southend-on-Sea	1	...	2	2	1	6	2	2	66	8	10	85	3	4	60	45	29	7	6	3	4	1	28	1	5	39	18	5	189	9	648	2	...
Tilbury ...	...	...	3	...	...	...	2	...	2	1	...	2	...	...	4	1	3	...	2	...	3	1	...	...	...	3	...	...	16	5	48	..	...
Waltham Holy Cross	...	...	...	...	1	...	...	...	7	2	...	8	...	...	8	4	4	...	...	1	3	2	2	...	...	4	2	...	17	3	68	...	...
Walthamstow ...	2	...	22	2	37	23	6	2	107	20	19	114	1	5	113	107	103	15	27	1	14	3	42	4	7	98	42	8	319	4	1267	...	1
Walton-on-the-Naze	...	...	...	...	...	...	1	...	3	...	...	1	...	...	3	4	1	1	...	1	...	...	1	...	...	2	3	...	4	...	24	...	...
Wanstead	...	...	2	...	...	1	1	1	7	1	...	11	...	...	20	7	8	...	1	...	1	...	4	1	1	9	1	1	18	9	106	...	...
Witham ...	1	...	...	...	...	...	1	...	3	1	1	8	...	...	12	4	1	...	...	...	...	...	2	...	...	1	1	...	18	...	54	...	...
Witnesmoe ...	1	...	...	...	...	...	...	...	5	1	...	2	1	...	3	...	2	...	...	...	...	...	...	...	...	1	2	...	13	...	31	...	...
Woodford ...	...	...	1	...	...	4	...	1	10	...	2	18	...	...	16	11	13	1	4	2	5	...	5	...	1	14	6	1	23	37	177	...	...
Total ...	20	...	103	21	175	86	67	16	638	120	184	753	38	32	716	639	551	98	137	28	84	13	289	24	43	603	262	43	2262	241	8286	4	1
RURAL.																																	
Belchamp ...	...	...	...	...	...	...	...	...	5	..	1	7	...	2	8	7	2	...	...	...	2	...	1	...	1	4	...	3	24	...	67	...	...
Billericay ...	...	...	1	...	1	...	6	...	9	...	5	16	1	...	27	16	5	4	1	4	...	1	8	...	1	11	10	1	63	4	197	...	...
Braintree ...	...	...	1	...	2	1	2	1	16	2	4	27	...	4	25	10	13	...	...	...	6	...	11	...	1	16	6	3	133	...	284	...	...
Bumpstead ...	...	...	1	...	1	...	1	...	2	1	1	7	...	1	3	5	...	1	1	...	1	...	3	...	...	2	...	...	14	...	45	...	...
Chelmsford ...	...	...	...	...	8	3	...	...	9	1	2	28	1	1	15	21	5	1	2	...	...	1	3	...	1	20	12	4	135	...	273	..	...
Dunmow ...	2	...	2	...	8	...	3	1	16	...	2	28	2	1	16	11	9	...	4	1	...	...	4	2	...	8	7	2	63	29	223*	...	...
Epping ...	...	...	1	3	1	3	1	1	7	...	1	18	1	2	19	12	12	1	1	...	3	...	9	...	3	2	11	...	57	...	169	...	...
Halstead I.	...	...	1	...	...	...	...	...	1	2	...	7	...	...	8	3	1	...	...	...	...	...	...	...	3	...	2	1	8	9	47	...	...
Halstead II.	...	...	...	...	3	...	1	...	4	...	2	5	...	...	16	10	6	1	...	1	...	...	3	...	...	5	...	1	13	10	81	...	...
Lexden & Winstree	...	...	2	...	2	...	1	1	20	...	1	29	...	...	22	9	19	2	1	...	...	...	5	...	2	5	6	2	105	2	237	...	...
Maldon ...	...	...	5	...	2	1	3	...	13	2	3	22	...	...	22	5	10	1	3	...	3	1	5	...	...	10	5	1	110	...	225	...	2
Ongar ...	...	...	...	1	2	...	1	...	6	1	1	15	...	2	9	4	5	...	...	...	2	...	2	1	1	2	3	...	23	23	104	...	...
Orsett ...	1	...	...	...	3	1	...	...	8	2	2	23	3	6	24	12	11	2	2	...	1	1	6	...	1	3	8	...	59	8	182	...	...
Rochford ...	2	...	...	...	2	2	4	1	8	2	3	16	...	...	12	12	8	...	1	...	5	...	3	...	1	13	10	1	59	23	178	...	...
Romford ...	...	...	3	3	5	1	4	2	18	1	5	21	...	...	30	21	15	7	4	2	...	1	2	1	4	20	7	3	71	3	254	...	1
Saffron Walden	...	...	...	...	2	3	2	...	7	1	1	18	1	1	15	12	7	2	...	...	1	...	4	...	1	4	2	3	70	...	157	...	...
Stansted	...	...	...	...	...	...	2	1	3	...	...	7	...	1	15	8	3	4	...	...	1	...	5	...	1	6	3	...	29	1	90	...	...
Tendring ...	1	...	2	...	6	1	1	...	19	3	1	17	1	1	23	28	18	6	4	3	2	...	5	...	1	22	7	1	101	5	279	...	2
Total ...	6	...	19	7	48	16	33	8	171	18	35	311	10	22	309	206	149	32	24	12	28	6	77	4	23	158	96	26	1121	116	3098	...	5

*7 deaths unclassified.

TABLE B.

DEATHS IN EACH DISTRICT CLASSIFIED ACCORDING TO AGES.
AREA, POPULATIONS 1901 CENSUS, 1911 CENSUS, & 1912 MID-YEAR, & No. OF BIRTHS.

Names of Localities.	Area in acres, land and inland water	Population, Census 1901.	Population, Census 1911.	Increase per cent. during decennium.	Decrease per cent. during decennium.	Population, middle of 1912, (estimated to mid-year).	Persons per acre.	No. of Births.	Birth-rate.	No. of Deaths Reg.	Death-rate.	Deaths from all causes at subjoined Ages. Under 1 year.	1 and under 2.	2 and under 5.	5 and under 15.	15 and under 25.	25 and under 45.	45 and under 65.	65 and upwards.	Deaths under 1 year per 1,000 births.
URBAN.																				
Barking	3,805	21,547	31,296	45·3	...	32,521	8·5	964	29·0	330	10·1	0	14	13	15	23	36	74	65	93·3
Braintree	2,224	5,330	6,168	15·7	...	6,168	2·8	132	21·4	92	14·9	7	...	...	4	8	9	13	51	53·0
Brentwood	460	4,952	6,923	40·4	...	6,939	15·1	113	16·2	43	6·1	1	...	...	5	5	5	10	17	8·7
Brightlingsea	2,867	4,501	4,403	...	2·15	4,392	1·5	91	20·7	65	14·7	2	3	...	1	...	5	17	37	21·9
Buckhurst Hill	873	4,786	4,886	2·1	...	4,900	5·6	69	14·0	45	9·1	4	1	2	1	4	5	6	22	58·0
Burnham	4,617	2,919	3,190	9·3	...	3,215	·71	59	18·3	45	13·9	3	...	...	1	2	4	7	28	50·8
Chelmsford	3,112	15,572	18,008	15·3	...	18,307	5·9	360	19·6	177	9·6	25	5	2	9	11	18	39	68	69·4
Chingford	2,808	4,373	8,184	87·2	...	8,680	3·1	185	21·3	82	9·4	16	3	5	7	5	8	10	28	86·5
Clacton	4,069	7,456	9,777	31·1	...	9,851	2·4	162	16·4	94	9·5	14	1	1	4	6	4	29	35	86·4
Colchester	11,333	38,573	43,452	13·3	...	44,160	3·9	873	19·7	470	10·6	56	12	15	8	25	67	113	174	64·1
East Ham	3,324	96,008	133,487	39·0	...	138,450	41·6	3,573	25·8	1,474	10·6	256	67	67	81	85	218	322	377	71·0
Epping	1,420	3,789	4,253	12·2	...	4,167	2·9	65	15·5	37	8·8	3	...	1	2	1	2	9	19	46·1
Frinton	422	647	1,510	133·4	...	1,570	3·7	25	15·9	12	7·6	1	...	...	3	1	1	5	1	40·0
Grays	1,359	13,834	15,998	15·7	...	16,420	12·1	401	24·4	163	9·9	35	11	9	11	3	20	25	49	86·0
Halstead	647	6,073	6,264	3·1	...	6,300	9·7	101	16·03	65	10·3	4	...	...	...	7	12	13	29	39·6
Harwich	1,541	10,070	13,622	35·3	...	13,973	9·1	340	24·3	163	11·6	25	17	7	7	6	23	38	40	73·5
Ilford	8,496	41,244	78,188	89·6	...	76,865	9·0	1,492	19·4	641	8·3	94	12	21	21	24	92	157	220	63·0
Leigh-on-Sea	1,527	3,667	7,713	110·4	...	8,550	5·6	141	16·4	96	11·1	12	2	2	4	6	13	20	37	85·1
Leyton	2,594	98,912	124,735	26·1	...	126,700	48·8	2,797	22·1	1,342	10·6	223	51	58	48	65	185	295	417	79·7
Loughton	3,961	4,730	5,433	14·9	...	5,500	1·4	105	19·0	59	10·7	7	...	2	0	3	14	13	20	66·6
Maldon	3,028	5,585	6,253	12·4	...	6,335	2·1	113	17·8	88	13·8	8	1	2	1	4	6	21	45	70·0
Romford	5,639	13,656	16,970	24·3	...	17,600	3·1	391	22·2	177	10·05	33	5	5	7	4	21	41	61	84·4
Saffron Walden	7,502	5,896	5,311	7·0	...	6,352	·85	110	17·3	60	9·4	5	1	1	3	...	7	15	28	45·0
Shoeburyness	1,036	4,081	5,004	22·7	...	5,075	4·9	171	33·6	43	8·4	12	1	...	1	7	7	7	8	70·1
Southend-on-Sea	5,172	28,857	62,713	117·3	...	67,284	13·0	1,310	19·47	643	9·63	74	15	19	18	23	112	167	220	56·48
Tilbury	1,855	5,203	6,429	23·5	...	7,000	3·7	131	18·6	48	6·8	6	...	3	5	1	6	18	9	45·8
Waltham Holy Cross ...	11,017	6,549	6,795	3·8	...	6,825	·62	119	17·4	68	9·9	8	1	...	...	2	12	18	27	67·2
Walthamstow	4,343	95,131	124,580	31·0	...	128,480	29·3	3,150	24·5	1,267	9·8	243	56	55	62	61	192	280	318	77·1
Walton-on-the-Naze	2,046	2,011	2,172	8·0	...	2,191	1·1	43	19·6	24	10·9	4	...	...	1	2	3	3	11	93·0
Wanstead	1,679	9,179	13,820	50·7	...	15,707	9·3	259	17·7	106	6·7	12	3	3	4	3	13	24	44	46·3
Witham	3,712	3,454	3,480	·75	...	3,483	·94	60	17·2	54	15·5	3	2	1	...	...	4	10	34	50·0
Wivenhoe	1,564	2,560	2,375	...	7·2	2,500	1·6	41	16·4	31	12·4	3	...	...	1	3	2	8	14	73·1
Woodford	2,161	13,798	18,496	34·0	...	19,075	8·8	355	18·6	177	9·2	29	2	6	6	6	19	48	61	81·6
Total	112,105	584,703	802,896	37·4		825,535	7·4	18,301	22·2	8,286	10·03	1,318	286	300	341	407	1145	1875	2,614	72·0
RURAL.																				
Belchamp	26,506	4,847	4,676	...	3·5	4,686	·17	84	17·9	67	14·2	6	...	2	...	5	9	10	35	71·4
Billericay	49,394	17,504	21,555	23·2	...	21,577	·44	383	17·7	197	9·1	18	4	4	1	16	23	47	84	46·9
Braintree	62,348	18,109	18,463	1·9	...	18,463	·29	318	17·2	284	15·3	25	3	6	5	5	38	52	150	78·6
Bumpstead	11,874	2,541	2,594	2·1	...	2,599	·22	60	23·1	45	17·3	4	2	1	2	...	5	11	29	66·0
Chelmsford	83,045	20,725	22,791	9·9	...	23,030	·28	517	22·4	273	11·8	38	7	9	9	7	23	44	136	73·5
Dunmow	73,503	15,705	16,084	2·4	...	16,136	·22	321	19·8	229	14·1	22	6	7	6	9	24	42	106*	68·5
Epping	39,055	12,783	13,959	9·2	...	14,138	·36	272	19·2	169	11·9	13	3	9	8	6	23	34	73	47·7
Halstead I.	18,200	4,481	4,704	4·9	...	4,747	·27	76	16·0	47	9·9	3	...	1	3	6	7	4	27	39·9
Halstead II.	20,512	5,695	5,628	...	1·2	5,628	·27	120	21·3	81	14·3	10	1	2	2	2	12	11	41	83·3
Lexden and Winstree ...	69,485	18,586	19,686	5·9	...	19,876	·28	405	20·3	237	11·9	19	3	6	2	10	19	53	125	46·9
Maldon	82,342	14,633	16,164	10·4	...	16,300	·19	341	20·9	225	13·8	23	7	1	9	10	17	39	119	67·4
Ongar	47,236	10,044	10,644	6·0	...	10,700	·22	209	19·5	104	9·7	13	3	1	2	8	9	24	44	62·2
Orsett	38,084	14,709	18,443	24·9	...	18,445	·48	428	23·2	182	9·8	24	3	4	8	10	25	36	72	56·0
Rochford	55,386	14,565	18,375	26·3	...	18,550	·33	384	20·7	178	9·5	23	4	9	4	7	15	30	86	59·8
Romford	29,720	19,018	25 356	33·4	...	26,000	·88	570	21·9	254	9·7	40	8	8	10	11	29	61	87	70·1
Saffron Walden	59,975	10,764	10,810	·44	...	10,615	·18	203	18·8	157	14·1	12	2	5	3	6	12	29	88	59·0
Wanstead	22,954	6,888	7,066	2·6	...	7,084	·31	130	18·3	90	12·7	9	2	1	6	2	6	19	45	65·2
Tendring	73,131	20,340	21,957	8·0	...	22,181	·30	440	19·8	279	12·5	40	14	9	7	12	25	46	126	90·9
Total	892,744	231,937	268,955	11·9		269,805	·30	5,261	20·2	3,098	11·8	342	72	85	87	128	321	592	1464	65·0

7 deaths unclassified.

TABLE C.

(Corresponding to Table II. of the Local Government Board.)

NUMBER OF CASES OF DISEASE NOTIFIED IN EACH DISTRICT AND NUMBER REMOVED TO HOSPITAL.

1912.

Names of Localities.	Cases Notified in each Locality.											Number of Cases Removed to Hospital from each Locality.										
	Small-pox.	Diphtheria and Membranous Croup.	Erysipelas.	Scarlet Fever.	Enteric Fever.	Continued Fever.	Puerperal Fever.	Cerebro-Spinal Fever.	Poliomyelitis.	Phthisis.	Totals.	Small-pox.	Diphtheria and Membranous Croup.	Erysipelas.	Scarlet Fever.	Enteric Fever.	Continued Fever.	Puerperal Fever.	Cerebro-Spinal Fever	Poliomyelitis.	Phthisis.	Totals.
URBAN.																						
Barking ...	...	35	42	95	10	...	2	...	3	104	291	..	24	...	89	9	...	...	...	...	3	125
Braintree ...	...	3	...	1	...	...	...	...	...	13	17	...	...	...	...	...	...	...	...	...	...	...
Brentwood ...	...	3	4	6	...	...	1	...	...	9	23	...	2	...	6	...	...	...	...	...	2	10
Brightlingsea ...	...	...	1	1	3	...	...	...	...	3	8	...	...	...	...	...	...	...	...	...	...	...
Buckhurst Hill ...	...	...	3	1	2	...	...	...	...	11	17	...	...	...	...	2	...	...	...	...	...	2
Burnham ...	...	...	1	9	...	...	...	...	...	3	13	...	...	...	6	...	...	...	...	...	...	...
Chelmsford ...	...	25	...	71	2	...	...	...	...	44	142	...	23	...	65	...	...	...	...	...	...	6
Chingford ...	...	29	2	18	1	...	...	...	...	16	66	...	19	...	5	...	...	...	...	...	6	94
Clacton ...	1	6	2	29	5	...	...	...	...	25	68	1	6	...	27	3	...	...	...	...	7	31
Colchester ...	...	31	38	28	1	...	...	...	...	85	185	...	28	...	24	...	...	...	...	...	...	37
East Ham ...	...	72	152	435	13	...	8	2	2	365	1049	...	52	28	334	9	...	4	1	1	153	582
Epping ...	...	3	2	22	...	...	...	...	...	11	38	...	3	...	22	...	...	...	...	...	1	26
Frinton ...	...	...	1	1	...	...	...	...	...	3	5	...	...	...	...	...	...	...	...	...	...	...
Grays ...	...	22	7	74	3	...	1	...	...	17	124	...	11	...	47	3	...	...	...	...	...	61
Halstead ...	...	1	3	1	...	...	2	...	4	28	39	...	1	...	1	...	...	...	...	...	...	2
Harwich ...	...	8	6	4	9	...	...	...	1	11	39	...	8	...	4	...	...	...	...	...	...	2
Ilford ...	...	139	57	286	4	...	6	...	1	173	666	...	98	4	217	9	...	...	...	...	...	21
Leigh-on-Sea ...	...	2	1	10	3	...	...	...	...	9	25	...	...	...	...	1	...	...	...	...	...	320
Leyton ...	...	155	133	330	20	1	16	...	2	370	1027	...	102	55	236	10	...	14	...	1	70	482
Loughton ...	...	...	...	2	1	...	...	...	...	10	13	...	...	...	2	1	...	...	...	...	...	...
Maldon ...	...	...	6	2	3	...	2	...	...	15	28	...	...	...	2	2	...	...	...	...	3	6
Romford ...	...	19	17	57	3	...	2	...	1	47	146	...	11	...	49	1	...	...	...	...	...	4
Saffron Walden ...	...	16	5	24	...	...	1	...	...	5	51	...	12	...	22	...	...	...	...	...	...	61
Sheerness ...	...	8	7	18	4	...	...	1	...	16	54	...	3	...	12	2	...	...	...	...	...	34
Southend-on-Sea ...	...	61	38	140	11	...	7	1	1	248	507	...	54	...	124	9	...	...	...	...	...	17
Tilbury ...	...	4	1	10	1	...	...	...	...	2	18	...	4	...	8	1	...	...	...	...	...	187
Waltham Holy Cross ...	...	3	2	36	...	...	...	...	...	16	57	...	3	...	35	...	...	...	...	...	...	13
Walthamstow ...	...	233	79	287	13	1	10	...	4	295	922	...	199	29	226	9	...	7	...	...	...	38
Walton-on-the-Naze ...	...	...	...	...	...	...	...	...	...	6	6	...	...	...	...	...	...	...	...	...	3	473
Wanstead ...	...	23	3	34	1	...	...	...	...	14	76	...	14	...	18	...	...	...	...	...	...	...
Witham ...	...	6	...	3	2	...	1	...	...	6	17	...	...	...	...	...	...	...	...	...	5	37
Wivenhoe ...	...	1	2	..	4	...	...	...	...	11	18	...	1	...	...	...	...	...	...	...	...	...
Woodford ...	...	15	10	36	1	...	...	...	...	33	95	...	10	...	22	1	...	...	...	...	...	1
Total ...	1	923	625	2071	120	2	59	4	21	2024	5850	1	688	116	1597	72	.	25	1	2	253	2755
RURAL.																						
Belchamp ...	...	...	1	5	...	...	...	...	...	7	13	...	...	...	...	...	...	...	...	...	...	...
Billericay ...	...	28	18	21	8	...	1	...	1	37	124	...	27	...	31	4	...	...	...	...	...	...
Braintree ...	...	16	9	38	4	...	...	...	...	21	88	...	15	...	29	4	...	...	...	1	...	63
Bumpstead ...	...	14	3	2	...	...	...	...	...	3	22	...	...	...	...	...	...	...	...	...	...	48
Chelmsford ...	...	23	7	41	2	...	...	...	...	39	112	...	17	...	33	...	...	...	...	...	...	...
Dunmow ...	...	11	14	35	9	...	3	...	...	40	112	...	6	...	18	8	...	...	...	...	...	50
Epping ...	...	18	12	38	1	...	...	...	...	19	88	...	16	...	18	...	...	...	...	...	...	32
Halstead No. 1 ...	...	2	10	8	2	...	...	...	...	6	28	...	1	...	...	...	...	...	...	...	...	34
Halstead No. 2 ...	...	1	3	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	1
Lexden & Winstree ...	...	3	8	34	4	...	1	...	...	42	93	...	2	...	12	1	...	...	...	...	...	...
Maldon ...	...	12	4	21	...	...	2	...	...	...	...	...	8	...	6	...	...	...	...	...	...	15
Ongar ...	...	2	4	7	...	...	...	...	4	15	56	...	...	...	6	...	...	...	...	...	...	14
Orsett ...	...	10	4	46	14	...	1	...	...	12	26	...	...	...	6	...	...	...	...	...	...	6
Rochford ...	...	28	5	29	8	...	...	...	...	25	99	...	7	...	16	13	...	...	...	...	...	...
Romford ...	...	24	16	42	1	...	...	...	...	33	103	...	10	...	21	1	...	...	...	...	3	39
Saffron Walden ...	...	25	1	42	...	...	4	...	1	44	132	...	14	...	34	...	...	...	...	...	2	34
Stansted ...	...	3	8	...	1	...	1	...	1	6	76	...	18	...	33	...	...	...	...	...	...	48
Tendring ...	...	10	3	18	6	...	...	...	...	5	17	...	3	...	...	...	...	...	...	...	...	51
Total ...	...	230	130	437	60	...	13	...	9	389	1268	..	149	...	266	37	...	...	...	1	5	458

TABLE D.

INFANT MORTALITY.

Nett Deaths from stated causes at various Ages under One Year of Age.

Cause of Death.	URBAN DISTRICTS.												RURAL DISTRICTS.											
	Under 1 week.	1—2 weeks.	2—3 weeks.	3—4 weeks.	Total under 4 weeks.	4 weeks and under 3 months.	3 months and under 6 months.	6 months and under 9 months.	9 months and under 12 months.	Total deaths under 1 year.	Percentage of total deaths due to each cause.	Mortality rate per 1,000 Births.	Under 1 week.	1—2 weeks.	2—3 weeks.	3—4 weeks.	Total under 4 weeks.	4 weeks and under 3 months.	3 months and under 6 months.	6 months and under 9 months.	9 months and under 12 months.	Total deaths under 1 year.	Percentage of total deaths due to each cause.	Mortality rate per 1,000 Births.
Small-pox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chicken-pox	...	...	...	...	...	...	1	1	...	2	·15	·11	...	...	...	...	...	...	...	...	...	...	...	...
Measles	...	...	1	...	1	1	1	3	13	19	1·44	1·03	...	...	...	...	...	...	...	1	1	2	·58	·38
Scarlet Fever	...	...	...	...	...	...	...	1	...	1	·08	·06	...	...	...	...	...	...	...	...	...	...	...	...
Whooping Cough	...	...	1	1	2	9	23	26	25	85	6·45	4·6	...	...	1	...	1	3	7	7	3	21	6·14	3·9
Diphtheria and Croup ...	...	...	...	...	...	...	...	1	1	2	·15	·11	...	1	...	1	2	2	...	1	...	5	1·46	·95
Erysipelas	...	1	1	1	3	...	1	...	...	4	·30	·22	...	...	1	...	1	...	...	...	...	1	·29	·19
Tuberculous Meningitis ...	...	...	...	...	...	3	5	11	5	24	1·82	1·3	...	...	...	...	...	...	1	...	1	2	·58	·38
Abdominal Tuberculosis ...	...	...	...	...	...	...	5	1	1	7	·53	·38	...	...	...	...	...	...	...	...	...	...	...	...
Other Tuberculous Diseases ...	...	...	...	...	...	5	2	4	1	12	·91	·66	...	...	...	...	...	...	..	...	1	1	·29	·19
Meningitis (not Tuberculous) ...	...	1	...	...	1	1	3	4	...	9	·69	·49	...	...	...	...	...	2	1	2	1	6	1·74	1·14
Convulsions	16	9	4	8	32	14	10	9	9	74	5·61	4·0	9	...	...	1	10	7	2	6	3	28	8·19	5·2
Laryngitis	...	...	...	...	...	1	...	...	...	1	·07	·06	...	...	...	...	...	...	...	...	...	...	...	...
Bronchitis	1	2	4	7	14	37	22	22	10	105	7·98	5·8	..	...	3	1	4	10	8	3	7	32	9·36	6·1
Pneumonia (all forms) ...	...	1	4	2	7	24	28	24	34	117	8·88	6·4	..	...	2	...	2	4	5	3	7	21	6·14	3·9
Diarrhœa	...	1	1	3	5	10	10	7	4	36	2·73	1·9	1	...	...	...	1	9	1	1	...	12	3·51	2·28
Enteritis	1	4	2	5	12	15	13	10	3	53	4·02	2·9	...	...	...	1	1	2	...	...	2	5	1·46	·95
Gastritis	...	3	1	...	4	2	2	1	1	10	·76	·54	1	...	1	...	2	...	1	1	...	4	1·16	·76
Syphilis	2	1	2	1	6	4	2	...	..	12	·91	·61	1	...	...	...	1	...	1	...	...	2	·58	·38
Rickets	...	1	...	...	1	...	1	...	4	6	·45	·31	...	...	...	...	...	...	2	...	1	3	·87	·57
Suffocation, overlying ...	5	2	1	3	11	8	6	1	2	28	2·12	1·5	2	...	...	...	2	1	...	1	...	4	1·16	·76
Injury at Birth	6	..	1	...	7	...	...	...	..	7	·53	·39	8	...	...	...	8	...	...	...	...	8	2·32	1·52
Atelectasis	15	3	...	1	19	2	1	1	1	24	1·82	1·3	5	1	1	...	7	1	...	...	...	8	2·32	1·52
Congenital Malformations ...	53	11	2	6	72	9	4	3	1	89	6·75	4·9	6	3	...	1	10	3	1	...	...	14	4·94	2·6
Premature Birth	201	27	21	14	263	13	6	1	...	283	21·48	15·4	66	3	7	4	80	5	1	...	....	86	25·14	16·3
Atrophy, Debility & Marasmus	47	27	17	22	113	61	33	11	9	227	17·22	12·4	17	5	6	5	33	11	9	3	1	57	16·66	10·8
Other causes	26	6	2	3	37	15	13	10	6	81	6·15	4·4	4	2	...	2	8	5	4	2	1	20	5·85	3·8
Total	373	100	65	72	610	234	192	152	130	1318	100·0	72·0	120	15	22	16	173	65	44	31	29	342	100·0	65·0