[Report 1911] / Medical Officer of Health, Cambridgeshire County Council.

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Cambridgeshire County Council.

ANNUAL REPORT

OF THE

Medical Officer of Health

FOR THE

Administrative County of Cambridge

For the Year 1911.

Cambridge:

THE CAMBRIDGE EXPRESS PRINTING Co., Ltd., 36, KING STREET.

PREFACE.

The returns of the census of April, 1911, show an increase of 7677 in the population of the Administrative County since the previous census of 1901, instead of an estimated decrease based on the returns of the two previous census years. Of recent years, therefore, the estimated birth and death rates, based on a supposed declining population, have been higher than the actual rates, and the experience of this County affords a further example of the desirability of the population being enumerated at five-yearly instead of ten-yearly intervals. It is satisfactory to be able to record that the increase in population includes the rural as well as the urban inhabitants of the County.

The birth rate declined further during the year, and the death rate showed an increase in common with that of the country generally. The increased mortality rate was due chiefly to the large number of deaths of infants from epidemic diarrhœa, attributable to the prolonged drought in the summer and early autumm. A widespread epidemic of measles also appreciably increased the number of deaths among young children.

The deficient rainfall for the third quarter of the year demonstrated the necessity for an improved supply of water in many parishes. During 1911 the County Council successfully intimated their opposition to a Water Bill, which would have taken water from Fordham for the benefit of an area outside the County. This step was taken on the understanding that the Newmarket Rural District Council would themselves

furnish a proper supply to Soham and Fordham. As this has not yet been carried into effect the intervention of the County Council appears called for. Improved supplies have been obtained for Lolworth and Madingley in the Swavesey and Chesterton Rural Districts, and a larger scheme is on foot for Wood Ditton and Cheveley in the Newmarket Rural District. A much needed scheme proposed for Caxton has recently been sanctioned by the Local Government Board.

House-to-house inspection under the Inspection of District Regulations has been carried out with varying degrees of activity, in some districts many inspections being made, in others a small number only. Many houses have been put into habitable condition, both as a consequence of inspection and on the initiative of the owners. An experimental housing scheme has been submitted to the Local Government Board by the Borough Authority. Progress has been made with schemes at Linton and Whittlesford, and preliminary steps have been taken at Willingham and Cottenham. It is suggested that enquiry is desirable at Waterbeach. The need for a system of scavenging for the larger villages in the Chesterton Rural District has for some years been the subject of reference in successive Annual Reports on the District, and the time appears to have arrived for decision.

Enquiry into the available air space for patients in the Isolation Hospitals shows that in these hospitals generally the standard advised by the Local Government Board is not obtained, and extended accommodation appears necessary. This is especially the case with regard to the hospitals of the Chesterton and Melbourn Rural Districts. Cambridge Borough Council are already moving in this direction.

The vaccination records again indicate a very unsatisfactory state of affairs, and a more satisfactory arrangement is needed for the immediate isolation of cases of small-pox should they arise. Last year I indicated the Borough Small-pox site as the most suitable, and I would advise that the matter be proceeded with.

The provisions of the National Insurance Act with regard to the treatment of tuberculosis among insured persons came into operation in July last. The funds rendered available under this Act and the Finance Act of 1911 afford an exceptional opportunity for the development of a scheme of tuberculosis prevention applicable to the whole community. For reasons already given in a special report the County Council appears to be the body best adapted to undertake such a scheme, and a combination with neighbouring County Authorities would present the advantage of economical and efficient administration.

FRANK ROBINSON,

County Medical Officer of Health.

County Public Health Department,
Cambridge,
September, 1912.

SUMMARY OF VITAL STATISTICS.

Shewing the principal general statistical items contained in this report.

Area of Administrative County - -	314,520 acres.
Population, estimated to middle of 1911	128,537 persons.
*Number of Sanitary Districts -	8 (2 Urban, 6 Rural).
Number of Parishes - - -	131

	1911.	Aver. of previous 5 years.
Birth Rate	**20·0**	21·4
Death Rate	**13·1**	13·2
Zymotic Death Rate...	**1·32**	0·65
Phthisis Death Rate...	**0·73**	0·93
Death Rate from other Tubercular Diseases	**0·37**	0·29
Death Rate from Respiratory Diseases ...	**1·47**	1·71
Cancer Death Rate	**1·09**	1·21
Infantile Mortality, *i.e.*, deaths under 1 year per 1,000 *births* registered	**97**	83

MEDICAL OFFICERS OF HEALTH.

Sanitary District.	Medical Officer of Health.
Cambridge Borough ...	Andrew J. Laird, M.D., D.P.H.
*Chesterton Urban District	Bushell Anningson, M.D., M.A.
Caxton & Arrington Rural	T. Poyntz Wright, M.R.C.S.E., L.S.A.
Chesterton „	Bushell Anningson, M.D., M.A.
Linton „	William Armistead, M.B., F.C.S.
Melbourn „	Bushell Anningson, M.D., M.A.
Newmarket „	William Armistead, M.B., F.C.S.
Swavesey „	Bushell Anningson, M.D., M.A.
Administrative County ...	Frank Robinson, M.D., D.P.H.

* Prior to extension of boundaries of Cambridge Borough in 1912.

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PRESCRIBED SUBJECTS FOR ANNUAL REPORTS.

The subjects upon which the County Medical Officer is required to report annually are specified in the County Medical Officers of Health (Duties) Order, issued by the Local Government Board in 1910. Speaking broadly, the Annual Report deals with the sanitary circumstances and administration and the vital statistics of the County and must include the following sections :—

(*a*) A digest of all annual and special reports made by the Medical Officers of Health of all County districts within the County :

(*b*) Isolation hospital accommodation available for each County district and the steps which should be taken to remedy any deficiencies which may exist :

(*c*) Administration of the Housing of the Working Classes Acts, 1890 to 1909 :

(*d*) Water supply of the several County districts :

(*e*) Pollution of streams within the County and steps for its prevention taken :—

(i) by the Local Authorities, and

(ii) by the County Council :

(*f*) Administration of the Midwives Act, 1902 :

(*g*) Administration of the Sale of Food and Drugs Acts, 1875 to 1907.

INDUSTRIES.

The Borough of Cambridge is mainly dependent upon the University, and is also the market town for the surrounding district.

Outside the Borough the main industries are agricultural in character, much of the County area being under cereal and root crops or pasturage. The production of milk is a trade of some importance. Cheesemaking, for which Cottenham, in the Chesterton Rural District, was formerly noted, is now a declining industry ; the making of milk-cheeses is still carried on at Swavesey.

The large jam-factory at Histon provides occupation for more than 1,000 workpeople, the related fruit-growing and garden produce industries employing the inhabitants of a considerable number of villages in the north-west portion of the County. Market gardening and fruit growing is also carried on in other districts.

The foundation of the School of Agriculture in Cambridge, which is not only an integral part of the University, but also functions as an agricultural centre for the eight Eastern Counties, will produce a considerable effect not only in this County, but throughout the whole district.

In addition to a large staff engaged in research and conducting the work of students in all subjects relating to the science and practice of agriculture, there has been recently formed by a special grant from the Board of Agriculture and Fisheries a department whose sole duty it is to advise farmers and others on all matters relating to Agricultural Practice and

also to undertake field and laboratory investigations in matters of local interest.

The School of Agriculture is also the official institute for the study of special problems in plant-breeding and animal nutrition under the joint control of the Drapers Professor of Agriculture, the Professor of Agricultural Botany, and the University Reader in Physiological Chemistry. The work of the School on the chemistry of flour, and the production of new and useful varieties of wheat, have gained world-wide recognition.

There is no mining in the usual sense of the term, but the digging of material and further processes in the manufacture of cement and bricks constitute important industries. Cement-making is prominent among these, chalk marl being dug for this purpose where it outcrops along the Cam valley. The important works at Shepreth and Meldreth, those near Cambridge in the direction of Cherryhinton, and the Portland cement factory at Burwell may be mentioned. Lime is also quarried for burning into mortar. There being little stone suitable for outside building material within the County, brick-making is an important industry, the gault-clay being dug for this purpose at Barnwell, Barton Road (Cambridge), Burwell, Soham, Chesterton, Impington and Clayhithe, while the Ampthill clay affords material for brick-making at Gamlingay.

Excavation of the Cambridge greensand at the base of the chalk marl for its contained phosphatic nodules (" coprolites ") was formerly a lucrative industry, but it has practically become extinct within the last 30 years. Artificial manures are manufactured at Burwell and Duxford, chiefly from imported materials.

The paper mills at Sawston, in the Linton Rural District, have been established for more than a century, as also have the factories for the manufacture of chamois leather and parchment. All these industries afford occupation for the inhabitants of Sawston, Whittlesford and Pampisford. In addition to the Pitt Press and other important printing and publishing establishments in Cambridge are printing works at Sawston and the Cavendish Press at Foxton.

Machinery is manufactured at Wimpole, and there is also a foundry and agricultural implement factory at Whittlesford.

Brewing is carried on at Cambridge and Pampisford, and mineral waters are manufactured at Sawston and Burwell. Among other industries are basket-making at Over and in the neighbourhood of Cambridge, and home work for the clothing and glove-making trades in various parts of the County.

HOUSING OF THE WORKING CLASSES.

Cambridge Borough.—The deficiency of cheap houses for the working classes in the Borough has been referred to in previous reports. A table given by Dr. Laird in his 1911 report shews the very small proportion of empty houses among those at rentals within the reach of the working classes. An exception to this is the high percentage of vacant houses rated under £4, but this is attributed to their unfitness for habitation. Closing Orders have been made by the Local Authority for 32 houses, of which 17 are being rendered habitable and 15 have been or will probably be demolished ; similar

action is recorded regarding 13 houses closed by Order in 1910 (7 repaired, 6 demolished). House-to-house inspection was made of 151 premises under the 1909 Act and plans for 110 new houses were passed, indicating an increase in building activity on the four years 1907 to 1910 (average 58 new houses) though below the average (136) for the 6 years 1901—6.

Application has been made to the Local Government Board for sanction for a loan for the erection of 18 houses in two blocks as a first instalment of 50 houses to be erected on a site in Stanley Road. Of the first block of six houses the two end houses will have living-room, scullery, three bedrooms and separate washing accommodation and will be let at 4s. 6d. a week, including rates and water. The four smaller houses will have two bedrooms and will share washing accomodation; the rents will be 3s. 6d. and 3s. a week according to size.

"The second block, consisting of twelve single room tenements is intended for the use only of old people. Six of the tenements are on the ground level, and six upstairs. Each consists of a single bed sitting room, the bed being in a recess which has a window of its own, thus providing for light and ventilation of the sleeping part, which could be curtained off without objection. Some of the rooms have a scullery which is partitioned off; the others have a larger room with the scullery accommodation in it. The rents for these tenements would be 2s. for the upper rooms and 2s. 3d. for the ground floor rooms per week."

The single-room tenements are intended to accommodate a class who are liable to seek the workhouse when displaced under housing operations, and the proposed provision is an experiment which will be followed with interest.

Chesterton Urban.—The Medical Officer of Health describes the house accommodation as generally good with ample air space. No doubt some reservation is called for with reference to the older property, systematic inspection of which was continued under the 1909 Act by the Sanitary Inspector, as intimation notices were issued regarding as many as 183 houses out of 219 inspected. Action taken under the Housing, Town Planning Act will be found in tabular form. This District has now passed under the control of the Cambridge Borough Council.

Chesterton Rural.—A special appointment was made for the assistance of the Sanitary Inspector in carrying out house-to-house inspection, and 2,374 houses were visited. New houses erected numbered 134; "very few of these are labourers' cottages, but their erection has the effect of setting free a certain number of cottages suitable for the labourer . . . The housing question having recently been brought so prominently before the public has had the effect of stimulating owners of property who have anticipated the Local Authority by voluntarily repairing a much larger number of cottages than hitherto." There have been 15 closures, 11 voluntary and 4 by closing order.

Compared with 124 new houses in 1910 the foregoing statement of the Medical Officer of Health does not represent a great increase in housing operations for the working classes, nor does it point to private enterprise as likely to meet existing needs. Dr. Anningson refers, however, to steps taken by the District Council at Willingham and Cottenham, and adds that "there appears to be a need for further cottage accommodation at Waterbeach, and it has been suggested that an enquiry should be made in the parish." With regard to Willingham, following an application made in

1910 by the Parish Council for the provision of working-class dwellings the District Council during 1911 resolved to enter into a provisional contract to purchase 5½ acres of land. At Cottenham a housing enquiry was held at which it was decided that the Parish Council should receive and forward to the District Council applications for working class dwellings.

Caxton and Arrington Rural.—Inspection of 110 houses, under the Housing Regulations, have been carried out, 15 being found unfit for human habitation. I quote Dr. Poyntz Wright's comments on housing conditions in his District in full. "The smaller tenements, occupied by artisans and agricultural labourers, are for the most part of the class usually met with in purely rural districts. Of air space there is abundance, and there are no back-to-back tenements. The cottages usually have two rooms downstairs, a general living room and a kitchen or scullery. These houses generally have two bedrooms, seldom three, and they generally have more or less garden ground attached. A great number of these tenements are often not desirable as residences, and were other good cottages available many of them would be certified as unsuitable for habitation, but until new cottages are built, if the undesirable ones were closed, some of the villages would be depopulated. I do not think that there are a dozen labourers' cottages in the entire district that possess a bedroom seven feet from floor to ceiling."

As only three houses have been built during the year, and five during the previous year, it is clear from the foregoing statement that there is considerable scope for the provision of houses suitable for the working classes in this district.

Linton Rural.—A certified Assistant to the Sanitary Inspector has been appointed for house inspection and 365

houses were inspected during 1911, of which 10 were considered unfit for human habitation. Five houses were closed without formal Orders. Defects were remedied in 21, dampness being the principal defect referred to by Dr. Armistead.

The increase in inhabited houses from 1910 to 1911 numbered 98, the population declining by 162 persons during the same period. Thirteen of the 14 houses built during 1911 were at Linton where the District Council have completed their scheme for the provision of 10 cottages for the working classes at a contract price for building of £1,455. Each cottage contains a parlour, living room, scullery, larder, earth closet and three bedrooms. All the rooms are 8 feet in height. The rentals are 2s. 6d. per week, except one at 3s. The District Council propose to erect 6 more cottages on the site of 2½ acres, which cost £160 and is sufficient for 16 cottages. The water supply is from a bored well (£50).

A Local Government Board enquiry has also been held regarding the proposal of the District Council to erect four cottages at Whittlesford.

Melbourn Rural.—Dr. Anningson states that systematic inspection has continued, the number of inspections made being 15. Ten new houses have been erected and reference is made to repairs. Three closing orders were threatened, resulting in repairs, and one Demolition Order was made.

Newmarket Rural.—The number of inhabited houses has increased by 278 during the intercensal period the population having also increased by 800 persons. Fifteen new houses were erected during 1911. Dr. Armistead has

in previous reports referred to the need for houses containing more than two bedrooms.

The Sanitary Inspector inspected 990 houses during 1911, of which 15 were regarded as unfit for human habitation. Six were closed without formal order. Here again Dr. Armistead makes special reference to dampness.

Swavesey Rural.—Dr. Anningson describes the dwellings for the working classes as chiefly old fashioned but not necessarily insalubrious and evidently considers that some fall short of the requirements of the Housing, Town Planning Act. "New cottages of a better type and with more sleeping accommodation are required in many of the villages." Four new houses were erected at Over. House to house inspection is stated to have been continued, the number of inspections made being 27. "There is a supervision over the erection of new houses in every instance, the sanitary conditions are approved by the Sanitary Inspector before occupancy."

Overcrowding.—The number of cases reported and dealt with during the year in the respective Districts was as follows :—Urban, Cambridge 10, Chesterton 2 : Rural, Caxton and Arrington 0, Chesterton 9, Linton 0, Melbourn 1, Newmarket 14, Swavesey 1. The total number dealt with was 37, (Urban 12, Rural 25), against 29 (Urban 11, Rural 18) in 1910. It is not specifically stated that legal proceedings were in any case necessary for abatement.

Summary.—There can be no doubt that the figures given regarding cases of overcrowding of dwellings which came to light in 1911 afford no index to the actual conditions in that respect, especially when taken in conjunction with the

frequently expressed opinion of the Medical Officers of Health as to the pressing need for dwellings with greater bedroom accommodation. On this point Dr. Armistead gives a useful table shewing the number of bedrooms in 365 houses inspected in 1911 in Linton Rural District, from which it appears that 57 and 226 houses had one and two bedrooms respectively, while 70 and 12 houses had three or more than three. Thus the proportion of houses with less than three bedrooms was no less than 77 per cent., and there is no reason to suppose that the Linton District differs materially from the rest of the rural portion of the county in this respect.

Statistics of the number of houses obtained at the 1911 census are not yet published by the Registrar General, but from the reports already issued information is obtainable regarding the increase in population. Whereas in agricultural counties generally the aggregate rate of increase since 1901 was 6.2 per cent. against 1.9 per cent. for the preceding inter-censal period, in the Administrative County the rate of increase was somewhat higher, viz., 6.7 per cent. as compared with an actual decrease of 0.3 per cent. from 1891—1901. In the rural parts of the County the rate of increase was practically identical with that for agricultural counties, viz., 6.18 per cent. Similarly the increase in the number of separate families or occupiers from 1901 to 1911 was at the rate of 9.4 per cent. for the county, Urban Districts 11.4 and Rural Districts 8.1 respectively. It is clear therefore that the housing problem within the County includes provision for an increasing number of separate households, if they are to be retained within its area, as well as putting into and keeping in habitable condition dwellings which systematic inspection shews to need such attention.

The Housing Regulations require a tabular statement to be inserted in the Annual Report by the Medical Officer of

Health affording information on specified points relating to house-to-house inspection and action taken by the Local Authority arising out of inspections made. The following table summarises such information as far as it is obtainable from the reports in question.

	Houses Inspected.	Houses unfit for habitation.	Houses represented unfit.
Cambridge Urban	151	?	42
Chesterton Urban	219	?15	15
Caxton and Arrington Rural ...	110	15	27
Chesterton Rural	2374	49	4
Linton Rural	365	10	5
Melbourn Rural	15	5*	3
Newmarket Rural	990	15	8
Swavesey	27	10	9

	Closing Orders made.	Remedied without Closing Orders.	Remedied after Closing Order.
Cambridge Urban	28	?	14
Chesterton Urban	3	12	2
Caxton and Arrington Rural ...	4	9	2
Chesterton Rural	4	45	—
Linton Rural	—†	21	—
Melbourn Rural	3	10	3
Newmarket Rural	—	7	—
Swavesey	7	3	7

* 2 Demolished without closing Orders.
† 5 Closed without Orders.

It will be seen from the foregoing statement that a large number of dwellings have been systematically inspected during the past year. The number reported as having been put into habitable condition, with or without Closing Orders, by no means represents the results achieved by the Local

Sanitary Authorities and their officers, as houses have also been repaired by the owners on private intimation notices apart from the formal statutory machinery. This was especially noticeable in the Chesterton Urban District, now part of the Borough of Cambridge. Also, as Dr. Anningson points out with regard to Chesterton Rural District, public interest has stimulated private owners to carry out repairs on their own initiative. It should be borne in mind in this connection that it is now implied in tenancies entered upon since the passing of the Housing, Town Planning Act that dwelling houses below specified rentals (£16 in rural areas) shall be kept in habitable condition, and that it is the duty of the Local Sanitary Authority to see that this obligation is complied with by the owner.

It is clear that though progress is being made as regards rendering existing dwellings habitable, there are other houses which cannot be put into reasonably habitable condition, and which are not closed simply because there is no other accommodation for tenants who would be displaced. The report of the Medical Officer for the Caxton and Arrington Rural District, for example, makes this abundantly clear. Another serious defect is the lack of sufficient bedroom accommodation in many of the cottages. Dr. Armistead's figures, already given, for the Linton Rural District illustrate this, and Dr. Anningson makes similar reference to Swavesey.

It may be argued that a declining population in certain rural districts is a sufficient excuse for inaction on the part of the District Council in seeing that healthy dwellings are provided for the working classes, in the absence of such provision being made by private enterprise. Such a decline is, however, due to the excess of emigration over the natural

increase of population, and it is clearly recognised that one powerful factor in producing this exodus to the towns is the insufficiency in the number of houses for labourers who are therefore unable to marry and settle down in their own locality. An active housing policy is therefore directly in the interest of a given rural district quite apart from the question of moral obligation or statutory requirement.

In the Rural Districts of Caxton and Arrington, Newmarket, Melbourn and Swavesey, no initiative is reported as having been taken by the District Councils for the provision of working class dwellings. On the other hand, Local Government Board enquiries have been made for sanction of loans in Cambridge Borough and in the Parish of Whittlesford (Linton Rural), and cottages have been built by the District Council at Linton, the erection of others being also contemplated. In the Chesterton Rural District preliminary steps have been taken with regard to the Parishes of Willingham and Cottenham, and an enquiry at Waterbeach is suggested as being desirable.

No representations were made during 1911 to the County Council as to default by Local Authorities to carry out their housing obligations under the Housing, Town Planning Act. A brief reference to the powers of the County Council under that Act may conveniently be made at this point.

The County Council may take action upon complaint made by the Parish Council, Parish Meeting or four inhabitant householders, and if satisfied of default of the Rural District Council may transfer to themselves the powers of that body for provision of working-class dwellings.

The County Council may apply to the Local Government Board, on grounds of expediency, for the transfer to themselves of the powers of a Rural District Council.

The County Council may complain regarding a defaulting Local Sanitary Authority to the Local Government Board, who may direct the County Council (consenting) to carry out necessary works.

The County Council may initiate or assist financially in the formation of Co-operative Building Societies.

WATER SUPPLY.

General Consideration of Sources of Supply.

(*The paragraphs on "general considerations" are inserted with but slight modification from previous reports.*)

Rainwater is largely used in the Rural Districts for washing purposes, but is only exceptionally the source of supply of drinking water. The impurities derived from the roofs of dwellings, from which, as a rule, it is collected, render its use undesirable for drinking purposes, except in the absence of water of a better class.

Springs and Water-Courses. These sources of supply are mainly derived from the chalk and are referred to under that heading. An excellent supply is obtainable from chalk springs, but liability to pollution exists.

Ponds, ditches and shallow wells.—Sources of this character are mentioned as being utilised in the Swavesey, Caxton and Arrington, Linton and Melbourn Rural Districts, and shallow

wells are the sole source of supply of various villages in other parts of the County. These are exceedingly unsatisfactory sources of supply as regards wholesomeness, and their insufficiency was abundantly proved by the drought of 1911. There is great danger of surface pollution from the methods adopted for the disposal of human excreta, from manuring the land, etc., and the volume available is much affected by seasonal variations. Such sources undoubtedly constitute a danger to the health of a community.

Gravels.—Where held up by an underlying stratum of clay an abundant supply of water may be obtained but the source is an unsatisfactory one, the volume being readily affected by drought and the quality being adversely affected by the facility with which local pollution is possible.. The Chesterton, Swavesey, and Caxton and Arrington Rural Districts may be mentioned in this connection.

Boulder Clay.—This formation covers a wide area of the Caxton and Arrington Rural District and also the high lands in the South East of the County. Its permeability is slight, but in some villages, *e.g.*, in Linton Rural District, springs or wells in the boulder clay are said to be the only available sources of supply. The water is usually very hard, but not otherwise of bad quality.

Chalk.—The Middle and Lower Chalk outcrop over a considerable area in the Melbourn, Linton, Newmarket, and Chesterton Rural Districts. The Upper Chalk is but little exposed in this County, being covered by Boulder Clay. To quote the Geological Survey Memoir :—"The Chalk here, as elsewhere, is pre-eminently a water-bearing formation, any wells carried down to the line of saturation being invariably supplied."

The Lower Chalk reaches the surface in a line running almost directly South West to North East, from Ashwell on the Hertfordshire border to Isleham on the Suffolk boundary. Springs are thrown out from the Cambridge Greensand at the base of this stratum, being held up by the Gault Clay, but are of comparatively small importance. Above the Cambridge Greensand beds of hard fissured rock occur in the Chalk marl, in which a great volume of water accumulates after percolating through the overlying permeable Chalk. A notable example is the Burwell Rock, which throws out strong springs along its outcrop, especially at Shelford, Cherryhinton, and the Shardelowes wells near Fulbourn which form the source of the Great Wilbraham stream. The Little Wilbraham river similarly takes its origin from springs in the neighbourhood. The Lower Chalk formation may thus be regarded as a vast underground reservoir of water, and the great bulk of the Cambridge Waterworks Company's supply is derived from this source. Though a rather hard water it is of excellent purity when not polluted by local conditions, but where such influences exist it is peculiarly liable to become contaminated because of the numerous fissures which are present in this geological formation.

Lower Greensand.—This is a water-bearing stratum of very great importance, and an excellent supply is obtained from it in some villages in Caxton and Arrington Rural District, by borings in the Chesterton Rural District, and in the North of the Newmarket Rural District and from many borings in the Melbourn Rural District. Private wells are also sunk into this stratum in the Borough, where it is reached at a depth of 125-200 feet. Dr. Anningson observes that an abundant and wholesome supply could be got from this source for some villages in the Chesterton Rural District, while some 200,000 gallons per day are raised at Cherryhinton by the

Cambridge University and Town Waterworks Company as part of their supply. The water is rather hard, but the stratum being over laid by Gault Clay is otherwise of excellent quality. The impermeable character of the Gault prevents any possibility of pollution of the under-lying water by surface contamination, while the water is effectually freed by natural filtration from any polluting matter which may have gained access to the Greensand at its outcrop. On the outcrop itself the value of the supply varies with its liability, or otherwise, to pollution from local conditions.

The outcrop of the stratum within the County area is a limited one, a narrow strip extending from the neighbourhood of Boxworth to beyond Cottenham, and the thickness of the formation is said not to exceed 70 feet. On these grounds the supply cannot be regarded as unlimited, and there is reason to believe that the water level has been falling for some years.

Jurassic Clays (Oxford, Ampthill and Kimeridge) Supplies from these clays are derived from contained bands of limestone and fossils, and are limited in quantity and uncertain in site. The depth to which it would be necessary to bore in order to reach the abandant supply which is believed to be beneath the Oxford clay cannot be definitely stated. but is probably very considerable. These clays outcrop in the North West of the County, reaching the surface in the Caxton and Arrington, Swavesey and the Chesterton Rural Districts.

Supply of Individual Districts.

With the exception of four houses, as far as known the *Borough of Cambridge* (together with the Chesterton Urban District and some parishes in the Chesterton Rural District) obtains its water supply from the Cambridge University and

Town Waterworks Company. The Company's present supply is derived from the neighbourhood of the villages of Cherryhinton and Fulbourn, in the Chesterton Rural District. At Fulbourn the whole of the Company's supply is pumped from a well immediately to the West of the village sunk into the Chalk to a depth of 70 feet. At Cherryhinton the bulk of the supply is obtained from a spring issuing from the chalk of the "Springhead," immediately South of the village of Old Cherryhinton, while a smaller quantity is pumped from a boring into the Lower Greensand. The mixed water from these sources is finally distributed by gravitation, the proportion of greensand water to chalk-water being roughly as one to six.

Dr. Laird reports that the average daily supply per head to the Borough is 26 gallons and was fully maintained during the drought of 1911. The bacteriologist (Dr. Graham Smith) examined the water daily and reports that the results obtained resembled those of previous years. The Bacillus Coli was absent during periods of small rainfall and present continuously during exceptionally wet periods (on 84 days in all) when the conditions were such as to favour surface pollution. Similarly organisms capable of growth on gelatine were more numerous during and after rainy periods. It is therefore satisfactory to note that the Water Company are now engaged on works on the Fleam Dyke site on the completion of which, or at the end of five years, the existing Lower Chalk supply is to be abandoned under the terms of the new Act.

Chesterton Urban.—"The vast majority of the houses are supplied by the Cambridge University and Town Waterworks Company; a few houses in the old village and in the agricultural area of the district are supplied from wells." This District is now almost entirely transferred to the Borough of Cambridge.

Chesterton Rural.—For geological reasons the water supply varies greatly in quantity and quality in the different villages. Those "situate on the chalk or large gravel patches could get an abundant supply if it were not locally polluted ; others again could get a supply both abundant and wholesome from the lower greensand ; others again have none of these advantages." The Cambridge University and Town Waterworks Company supply a constant service to Cherryhinton, Fulbourn, Great Shelford, Trumpington, Newnham Croft, Grantchester, Histon, Impington and part of Fen Ditton. Cottenham Water Works supply the villages of Cottenham and Rampton on the constant service system, by gravitation from an elevated tank, by means of public standpipes and private connections.

Dr. Anningson also supplies the following information as to supplies of other villages :—" Madingley is supplied by standpipes with Greensand water. Longstanton All Saints is supplied by 3 public pumps, connected to a well in the gravel at the Station end of the village. The following villages have public pumps to wells in the Greensand :—Little Shelford 2, Waterbeach 5, Oakington 2, Fen Ditton 3, Landbeach 2, Girton 2, Haslingfield 2, Barton 1, and 1 in the Gravel. Coton 1, and 1 in the chalk, Harlton 1, Horningsea 1, Dry Drayton 1, Hauxton 1 and 1 Spring, Milton 1, Harston 4 natural springs. Stapleford 1 Public Pump to well in the chalk, Comberton 1 Public Pump to well in the gravel. Willingham Public and numerous Private Pumps to wells in the gravel ; the supply is plentiful, but the quality unsatisfactory. The villages of Great and Little Wilbraham, Quy, Teversham, Westwick, Longstanton St. Michæl, Newton and Childerley obtain a supply from private sources."

Steps towards improved supplies were taken during 1911 at Madingley, Fen Ditton and Willingham. At Madingley a

deep well was sunk to the Lower Greensand by Col. Harding, the water being pumped by a windmill to a reservoir which feeds standpipes in the village. At Fen Ditton a new public well has been dug and bored to a depth of 152 feet to the Lower Greensand, water rising to 30 feet of the surface. Surface water is excluded by lining with iron cylinders through chalk into the gault clay, with brickwork in cement for the upper few feet. At Willingham trial holes sunk into the gravel to the South-west of the village yielded a water said to give a satisfactory analysis but somewhat hard. Supply by private company is anticipated and a prospectus has recently been issued during 1912. It is to be hoped that a satisfactory supply will soon be furnished to this village, as the proposed housing operations have been delayed to some extent by deficiency in this respect.

Of 134 newly occupied houses in the Rural District, 103 were supplied from public and 31 from private sources. Successful legal proceedings were taken against the owners in two instances for permitting occupation without first obtaining a water certificate as required by the Public Health (Water) Act, 1878.

Caxton and Arrington.—Difficulty arises in this Rural District owing to the outcrop of the Jurassic Clays over a considerable portion of its area (see page 17). Apart from villages supplied from the Lower Greensand, shallow wells are sunk into the gravel overlying the clays and yield an unsatisfactory supply liable to surface pollution. Such supplies naturally fail during periods of exceptionally dry weather such as prevailed in 1911. "There are certain portions of the district where the water, although from well, is of good quality, the supply being afforded from the Lower Greensand formation, whilst Longstow, Knapwell and part of the village of

Bourn are supplied by the East Hunts. Company's mains." This company derives its supply from a well in the Lower Greensand.

Dr. Poyntz Wright gives an account of the supply to Bourn and Caxton. Thirty houses in Bourn being without proper supply the owners were required to deal with the matter, and were advised to utilise the Company's water. The extension of the main opened up the water question in the adjoining parish of Caxton, upon which the Medical Officer of Health reported, and into which I also made personal enquiries. The only undoubted public source of supply is a pond which is open to gross pollution and which has afforded exceedingly unsatisfactory results from analysis. The workhouse supply for drinking purposes has to be carted a distance of about half a mile, the rainwater stored on the premises being used for washing only. A Local Government Board enquiry was held on the application of the District Council for sanction for a loan for extension of the Company's main to Caxton, and the Board have recently intimated their approval and their hope that the workhouse will be supplied from this source.

The Rural District Council have also considered the existing supplies to the adjoining parishes of Croxton, Eltisley, Graveley and Papworth St. Agnes, and proposals have been made for combination with the St. Neots (Hunts) Rural District Council for a joint scheme utilising the Paxton public supply obtained from the gravel beds of the Ouse. Joint application has been made to the Local Government Board for a local enquiry. Dr. Poyntz Wright is of opinion that "there can be no doubt whatever that if the project could be carried through it would be of immense benefit to all the parishes included," and I quite agree with him. The

public well at Croxton has never given satisfactory analysis, that at Eltisley is inconveniently situated for many houses, Papworth St. Agnes obtains drinking water from a pond (the well being used for washing purposes), while at Graveley the inhabitants drink mainly from a pond by the road-side, the deep well having never been regarded as satisfactory and being inconveniently situated for much of the village.

Linton Rural.—The chief source of supply is the chalk, wells being sunk directly into it or bored through boulder clay. On the high boulder clay some villages depend mainly on ponds, and such localities naturally suffered severely during the drought of 1911. "None of the villages in this District derive their water supply from a public piped service, but the following parishes have public wells belonging to the Rural District Council :—Linton (3), Sawston (7), Pampisford (5), Babraham (1), Balsham (3), Carlton (1), Castle Camps (1). Hinxton (1), Horseheath (4), Ickleton (1), Weston Colville (1), West Wickham (1), West Wratting (1), Whittlesford (3). The other parishes are supplied chiefly from private wells."

The table of wells appended to this section (pp.29-31) is modified from that in previous reports by a table given by Dr. Armistead.

Melbourn Rural.—The lower Greensand formation affords a valuable source of pure water available for a large part of this District, being effectually protected from surface pollution by the Gault clay. As previously reported borings have been made in the following villages :—Abington Pigotts, 2 public ; Barrington, 4 public and 4 private ; Bassingbourn, 2 public ; Foxton, 2 public and 1 private ; Kneesworth, 1 public ; Meldreth, 6 or 7 public, 16 private (including 3 for trade purposes) ; Shepreth, 6 private ; Shingay, 1 public, 4 (?8) private ; Wendy, 2 private (one used by public) ; Whaddon, 3

public and several private; Guilden Morden, 1 public. Dr. Anningson reports that new artesian wells have been bored during 1911, 1 each at Shepreth, Fowlmere and Meldreth.

Mention has been made from time to time of the waste of water resulting from overflow from public and private supplies and from disused coprolite workings to such an extent that the water level in this stratum is considered on good grounds to have fallen considerably of recent years. It is exceedingly unfortunate that there is no statutory obligation to refrain from deliberate waste of this character and that any private person or public body is at liberty to permit water to run constantly from these artesian borings without let or hindrance. The question of the practicability of dealing with existing borings is again before the Public Health Committee, and it is a matter for serious consideration whether a Bill could be promoted to prevent future waste.

Great and Little Chishall, where chalk water lies at a depth of 300 feet, derive part of their supply from wells and part from ponds. Other villages are supplied from surface wells, many of which are liable to local contamination,and occasionally from natural springs and water courses. Dr. Anningson states that for villages lying in the Cam valley an abundant supply of wholesome water could be obtained at the source.

Newmarket Rural.—In this District the chalk is partly exposed, but is covered by boulder clay on the rising ground to the South, while to the North chalk and gault are covered by fen deposits. The chief supply of water is derived from the chalk; " in the valley a sufficient supply is obtained by means of shallow wells dug in the chalk, or in the gravel overlying the chalk, but on the higher ground where the chalk is covered with boulder clay the walls are deep, and some of the inhabitants have to depend upon ponds." To the North wells

are bored to the lower greensand in some parishes. There are also some shallow wells in the boulder clay.

Ponds and surface water supplies failed in places during 1911, but Dr. Armistead states that there was no complaint, except at Woodditton where water had to be carted. A Local Government enquiry was held regarding proposed experimental works for a scheme for the supply of Woodditton and Cheveley, and sanction was subsequently given. Dr. Armstead gives details of the scheme. The site is at Saxon Street, in a central position. The proposal is to sink a 10-inch borehole through the boulder clay into the chalk, a total distance of 350 to 380 feet, the boring being taken well below the permanent water level. Surface water will be excluded by a lining of steel tubes to a depth of 150 feet below the ground level, and future lowering of water level will be guarded against by fixing the pump barrel 30 feet below water level. The pump will lift 2000 gallons an hour into a tank of 34,000 gallons capacity, equal to two days' supply, contained in a water tower above the engine house.

Part of the parishes of Woodditton and Cheveley are satisfactorily supplied by the Newmarket Waterworks Company; and the parish of Stetchworth has a piped service provided by the Rural District Council in 1903. The water is pumped by an oil engine through an 8 inch bore through boulder clay into chalk at a depth of 325 feet. There is a possible yield of over 25,000 gallons, though little more than 2,000 are used. There is adequate pressure, and the supply is constant and good.

A new public well has been sunk at Reach, and other improvements are noted.

A Bill promoted in the early part of 1911 included proposals to take water from the neighbourhood of Fordham for the supply of parishes in the County of the Isle of Ely, and

incidentally a supply would be available for Soham and Fordham. This was opposed by the County Council at the request of the Newmarket District Council and the proposal to take water from this area was withdrawn.

There was an understanding by the County Council that the District Council would themselves provide an adequate supply for Soham and Fordham, and a scheme previously prepared, under which water would be derived from the chalk near Fordham, at a cost of £8,600, has been again considered. Quite recently the District Council have resolved not to proceed further with this scheme, and the matter has been referred to me for enquiry by the County Public Health Committee.

Dr. Armistead's table of sources of water for each parish in the District is appended to this section, in substitution for those which have recently appeared.

Swavesey Rural.—Dr. Anningson reports as follows :—" A water supply has been provided for the village of Lolworth by the joint action of Messrs. Frohock and Daintree. Under Mr. Frohock's direction, a well has been made in the Lower Greensand, and a pumping station with reservoir and glazed pipes has been provided. This is a great boon to the village, which has been so long deficient in water supply. The Council has made an arrangement with the East Hunts. Water Company for a supply for the village of Swavesey, so the water question, which has engaged the attention of the Council for so many years, may now be regarded as finally settled."

Prior to the new supply, Lolworth was dependent upon a pond adjacent to allotments and open to contamination ; the supply failed during the drought.

The following table, compiled from the quarterly reports of the County Analyst, Mr. West Knights, shows the number of water samples submitted to him during the year by the

various Local Authorities. It will be seen that of a total of 61 samples 42 gave satisfactory results, while 19 were polluted with sewage and unfit for drinking purposes.

	Fit.	Unfit.	Total.
Chesterton Rural District Council ...	17	12	29
Linton	8	1	9
Melbourn	3	—	3
Newmarket	3	2	5
Private	11	4	15
	42	19	61

Early in 1912 a Conference on Water Supplies was held at the Guildhall, Cambridge, under the auspices of the Rural Sanitation and Housing Association, chiefly through the instrumentality of Miss C. Cochrane. The meeting, under the Chairmanship of Sir George Fordham, was largely attended by representatives of Local Authorities interested in water supplies, and a paper was read by Professor Kenwood on Rural Water Supplies and subsequently discussed. An important point made, which is often overlooked, was that an ample supply of pure water is required not only to avoid danger of illness from specific contamination with the germs of disease, but also because the general standard of life is lowered by its deficiency. Some deserved emphasis was laid on the methods which may be resorted to for the exclusion of surface water, as far as is practicable, from shallow wells when such source is unavoidable. One is tempted to believe at times that these wells are not merely carelessly or ignorantly constructed but deliberately designed to admit surface water without preliminary filtration through the protective layers of the soil. The Conference clearly aroused interest, not merely from the theoretical but from the practical standpoint, and it may be hoped that this will be demonstrated in a practical manner throughout the County area.

NEWMARKET RURAL DISTRICT COURCIL.

Water Supply.

Parish.	Area in Acres.	Population in 1911.	Est. No. of Houses.	Water Supply.
Ashley	2224	561	130	Public deep well from chalk and other wells.
Burrough Green	2271	444	90	Wells and springs in boulder clay.
Bottisham	2851	704	160	Public pump supplied from deep bored tube well, water from lower greensand and other wells in chalk and lower greensand.
Brinkley	1303	246	55	Public well and pump water from gravel spring in boulder clay.
Burwell	7417	2144	540	Five public bored walls, water in four from chalk and one from lower greensand.
Cheveley	2557	724	160	Deep wells in chalk, also shallow wells and spring.
Chippenham	4284	513	120	Wells chiefly in chalk.
Dullingham	3386	765	170	Three public wells in chalk ; also other wells, springs, ponds.
Fordham	4195	1410	350	Wells in chalk ; also from stream occasionally.
Isleham	5207	1643	390	Wells in chalk, and River Lark.

Newmarket Rural District Council—*continued.*

Parish.	Area in Acres.	Population in 1911.	Est. No. of Houses.	Water Supply.
Kennett	1425	182	40	Wells in gravel and chalk.
Kirtling	3123	627	145	Deep wells in chalk; also shallow wells.
Landwade	126	22	4	Wells in chalk.
Lode	3117	679	150	River and shallow wells.
Snailwell	2032	207	43	Wells and springs in chalk.
Soham	12946	4682	1100	Eight public bored wells, seven in lower greensand and one in chalk; also other wells.
Stetchworth	2889	776	175	PIPED SERVICE, Rural District Council. Also 5 deep wells in chalk.
Swaffham Bulbeck	4092	714	160	Three public pumps supplied from tube wells, two bored into chalk, and one into lower greensand.
Swaffham Prior	5563	934	240	Numerous wells in chalk.
Westley	1148	208	46	Deep well in chalk.
Wicken	3934	682	180	Four public pumps supplied from tube wells bored into lower greensand.
Woodditton	4768	997	220	Two public pumps, one supplied from deep well in chalk, and one from shallow well.

LINTON RURAL DISTRICT COUNCIL.

Water Supply.

Parish.	Area in Acres.	Population in 1911.	Est. No. of Houses.	Water Supply.
Abington, Great	1586	255	65	Wells in chalk.
Abington, Little	1306	247	60	Wells in chalk.
Babraham	2383	291	65	Public pump supplied by by well in chalk ; and other wells in chalk.
Balsham	4549	804	195	Four public wells (3 in chalk) and other wells in chalk or gravel.
Bartlow	377	90	24	Wells in chalk.
Carlton	2413	279	62	Public pump supplied from spring, also ponds and other wells.
Castle Camps	3181	670	170	Public well, with water elevator, also ponds and springs and other wells.
Duxford	3233	764	180	Wells in chalk.
Hildersham	1507	201	46	Wells in chalk and gravel.
Hinxton	1558	325	80	Public pump supplied by tube well bored into chalk ; and other wells in chalk.

Linton Rural District Council—*continued.*

Parish.	Area in Acres.	Population in 1911.	Est. No. of Houses.	Water Supply.
Horseheath	1919	411	93	Four public pumps, three supplied by filtered pond water, and one from a spring.
Ickleton	2695	637	150	Public pump supplied by well in chalk, and other wells in chalk or gravel.
Linton	3806	1501	375	Three public pumps supplied by tube wells bored into chalk; and other wells.
Pampisford	1605	243	69	Five public pumps supplied by tube wells bored into chalk; and other wells.
Sawston	1884	1578	405	Seven public pumps supplied by tube wells bored into chalk; and other wells.
Shudy Camps	2361	287	70	Deep wells dug through boulder clay; and ponds.
Weston Colville	3234	458	105	Public pump supplied from well in chalk; and one spring; also other wells, ponds, and rain water tanks.

Linton Rural District Council—*continued.*

Parish.	Area in Acres.	Population in 1911.	Est. No. of Houses.	Water Supply.
West Wickham	2929	336	86	Public pump supplied by deep well dug through boulder clay into chalk ; also spring with pump, and ponds.
West Wratting	3541	470	115	Public pump supplied by deep well dug through boulder clay into chalk ; and ponds.
Whittlesford	1969	720	185	Three public pumps supplied by tube wells bored into chalk ; and other wells.

MILK SUPPLY.

Adulteration.—During the year 58 samples of milk and 1 of skimmed milk were submitted for analysis by the County Analyst, Mr. J. West Knights. All were reported to be genuine. The samples are taken by the police, and it does not appear that any informal samples were taken.

In the Borough of Cambridge 42 informal samples were taken, of which 4 were deficient in fat in degrees varying from 3 to 22 per cent., and one contained 35 per cent. of added water. The vendors were in all cases warned. The samples taken under the formal statutory procedure were 36 in number of which 9 were adulterated. Of these, 5 were deficient in fat, varying from 6 to 18 per cent. deficiency (4 convictions), two contained added water to the extent of 8 and 26 per cent. respectively (one convicted, one dismissed) and one contained cow dung (fine). In all there were 8 prosecutions with 7 convictions. Six samples of cream taken informally all proved genuine.

No statement appears as to the presence of chemical preservatives in samples taken by either Authority; their addition is an offence under the Sale of Food and Drugs Acts. As Dr. Laird points out, they are unnecessary if scrupulous cleanliness is observed (as it should be and too frequently is not) and they mask the presence of disease germs without destroying them. As this goes to press, the new regulations of the Local Government Board have come to hand, which prohibit the use of preservatives in milk and restrict their use in cream to those of the nature and in the amount specified.

Tuberculosis.—During the year 27 samples were submitted from the Borough for bacteriological examination by Dr.

Graham Smith, and two were found to contain the tubercle bacillus. It has commonly been found that milk from rural areas more frequently affords evidence of tubercular infection than that from urban cowsheds, and it is very desirable that samples should be submitted for bacteriological examination.

Dr. Anningson states that notice was received from the London County Council of a cow suffering from tuberculosis in the Chesterton Rural District, but it was found on visiting the farm that the stock had been sold. Under a General Powers Act, the London County Council are empowered to follow up tubercular milk to its source in other county areas, and notice is given of proposed visits of inspection. The weak point is that the owner can only be advised, not compelled, to isolate tubercular cattle, and unscrupulous owners take the earliest opportunity of disposing of such beasts, which may continue to be milked in other districts or be consumed as human food.

General Administration.—The following paragraphs deal with the reports of the Medical Officers of Health on the production, distribution and sale of milk in their respective districts.

Cambridge Borough.—The milk supply has been the subject of special enquiry during the year, and receives extended notice in Dr. Laird's report. There were 305 milch cows in the Borough, kept by 30 cowkeepers, practically all the milk being sold in the Borough. Many purveyors who are not cowkeepers sell milk produced both within and without the Borough, and large dealers import milk and cream from other counties.

Dr. Laird estimates that less than half a pint of milk per head is consumed daily, purchase being made on a very small

scale among the poorest. The experience of the Health Visitors also goes to show that the use of condensed milk is exceptional for infants.

Dealing with bacterial pollution which may result from contamination with dirt or with the specific organisms of infectious disease, the necessity is urged for the strictest possible precautions at every stage of the production, distribution and storage of milk, and the possible sources of pollution are considered in some detail.

Inspections of the 29 registered cowsheds numbered 109, and photographs shew very clearly the defective condition of some, and also their improved condition after remedial steps had been taken. Dr. Laird considers the results highly gratifying and an indication of what can be done by steady pressure. In addition to improvements made, some of the worst sheds have been abandoned.

Except in the cases of large firms the methods of milking are not cleanly, the " wet " method, which conveys dirt from the hands to the milk, being customary. About half the cowkeepers make a rough attempt at grooming the cows before milking. Proper methods of milk cooling are exceptional. It is clear that there is decided scope for the issue of a placard of instructions to milkers such as is quoted by Dr. Laird. The County Council issued a poster in the simplest terms in 1910.

Exception is taken to the practice of ladling milk during retail by dipping into a deep can as affording facilities for contamination from the hands, dipper and atmosphere. The use of a sealed can with a draw-off tap is advocated. At least two firms deliver their milk in sealed bottles, the ideal method from this point of view.

To the 43 milkshops and dairies 159 visits of inspection were paid. They are described as fairly clean on the whole, but the milk is as a rule kept uncovered. As the places of sale are commonly grocers' or greengrocers' shops, contamination with dirt or from strong smelling articles results in some cases. The milk should therefore be properly protected from flies and dirt, and from other articles for sale, the shop being also separated completely from the living room. Dr. Laird's suggestion that the sale of milk by "general dealers" should be prohibited is one with which I am in agreement. Reference is also made to the advantage to be derived from education of milk producers, distributors and consumers by means of leaflets, from annual certification of dairymen whose premises and methods reach a satisfactory standard, and from routine inspection of dairy cattle.

Chesterton Urban.—There are 25 cowsheds and dairies, to which 78 visits of inspection were paid. The Sanitary Inspector considers that, generally speaking, the desired standard of cleanliness was maintained, "although some milkers, when busy, lapse into their former slovenly habits and omit the necessary cleansing."

Caxton and Arrington Rural.—All the 9 licensed cowsheds and dairies were visited. Dr. Poyntz Wright describes one newly licensed cowshed as being structurally "in every respect what such a building should be." He also refers to the liability of milk to become polluted after purchase by neglect by the purchaser to preserve it from contamination by the simple precaution of keeping it in a closely covered vessel.

Chesterton Rural.—There are 92 licensed cowkeepers; the number of inspections paid is not stated. Many cows are housed in open sheds or are kept in the open except in severe

weather. Regulations under the Dairies, Cowsheds and Milkshops Order are in force. Placards of advice to milkers are supplied.

Structural improvements in 6 cowsheds are noted, and two cowkeepers have removed to more suitable premises. Polluted water supplies to two dairies led to sinking a well to the Lower Greensand in one case and closure of the well in the other.

Linton Rural.—There are 12 registered cowkeepers and one registered milkshop. Milk is sent to London and Cambridge. Regulations are in force. Twelve inspections of cowsheds were made and 13 of dairies and milkshops.

Melbourn Rural.—"Dairies and cowsheds have been periodically inspected." The number of registered dealers is not stated, and the number of inspections is not given separately.

Newmarket Rural.—Model Regulations are in force and a register is kept. There are 19 licensed cowkeepers, 8 of whom send milk to London, 5 to Newmarket and one to Cambridge. There are 21 registered cowsheds and 11 dairies : no milkshops. The number of cows averages about 472. Forty-five visits of inspection were paid, the general condition being described as fairly satisfactory.

Swavesey Rural.—Regulations under the Dairies, Cowsheds and Milkshops Order are in force, and inspection has been carried out (number of premises and inspections not separately stated), "but unfortunately no action under the Order has been taken since January 1st, 1900." Dr. Annington repeats his recommendation of previous years for cleanly

milk production by milking in the open on an impervious floor and cooling and storing the milk in a properly constructed dairy without direct communication with the house.

Speaking generally, there is a somewhat ominous absence of enthusiasm in the references made by the Medical Officers of Health to the structural and general sanitary conditions prevailing, and an even more suggestive absence of criticism in some instances. The natural inference is that many premises are not in a satisfactory condition, and one's own observations from time to time go to substantiate this. It is very desirable that registration should apply not only to cowkeepers but to the actual premises, and that an annual renewal of such a license should be required which should be dependent upon sanitary conditions benig maintained. The Milk and Dairies Bill of 1909 contained provisions of this character, and it is greatly to be hoped that similar provisions may pass into law without delay. It seems clear that an annual visit cannot effectually ensure the maintenance of cleanly conditions, even if the premises are structurally satisfactory, but the difficulty is to maintain constant supervision with the staff available. It is fortunate for the consumer that in rural areas in this part of the country it is customary to keep the cows in the open for the greater part of the year, thus tending to limit the transmission of tuberculosis, an infection to which milch cows are notoriously prone. It is now widely known that the Royal Commission on Tuberculosis were in no doubt as to the direct infection of children with tuberculosis (especially of the lymphatic glands and abdominal organs) by milk from tubercular cattle and I quote here one paragraph from their report : " In the interests, therefore, of infants and children, the members of the population whom we have proved to be especially endangered, and for the reasonable safeguarding of the public

health generally, we would urge that existing regulations and supervision of milk production and meat preparation be not relaxed; that, on the contrary, Government should cause to be enforced throughout the kingdom food regulations planned to afford better security against the infection of human beings through the medium of articles of diet derived from tuberculous animals."

Prominent among such regulations would require to be those enforcing a cleanly, sanitary environment for cattle in cowsheds structurally unfavourable to the growth and transmission of tuberculosis. Not less important is the provision for the detection of tuberculous cows in dairies by periodic inspection made by experienced veterinary officers, provision which has not yet been made in this County. Writing of Caxton and Arrington Rural District, Dr. Poyntz Wright says in this connection:—"No arrangements are made in this District for the periodical examination by a qualified veterinary surgeon of all cows in each dairy. I cannot speak too strongly on this point, because without such examination it is absolutely impossible to ascertain what (if any) tuberculous animals are being milked in the district and tuberculous milk sold daily." Dr. Poyntz Wright also declares in favour of examination of milkers, milk carriers and retailers, as also being capable of infecting the milk which they handle.

FOODS OTHER THAN MILK.

Adulteration.—The administration of the Food and Drugs Acts is in the hands of the police in this County. Under the Order prescribing his duties the County Medical Officer is required to include in his Annual Report a section on the

administration of these Acts. In a recent circular issued by the Local Government Board explanatory of "The Public Health (Milk and Cream) Regulations, 1912," the following passage occurs. "It will be desirable that the Medical Officer of Health should be instructed to exercise general supervision over the action taken in pursuance of these Regulations, and that the Officer of the Council who directs sampling under the Sale of Food and Drugs Acts should be instructed to confer with the Medical Officer of Health and with the Public Analyst as to the details of procedure necessary to secure the observance of the Regulations in the area over which the Council has supervision."

The samples of milk analysed (59) for the County Authority were dealt with in the section on Milk Supply. In addition 117 other food samples were submitted to the County Analyst, including butter (39), margarine (13), cheese (13), lard (9), sugar (7), flour (2), corn-flour (2), rice (7), tapioca (3), arrowroot (1), tapioca (3), pepper (3), mustard (2), vinegar (2), cocoa (3), tea (6), coffee (1), whisky (2), and gin (2). All the samples were reported to be genuine. Including milk 176 samples in all were taken for analysis, practically 2 samples per 1,000 of the population.

In the Borough of Cambridge, apart from samples of milk and cream (84), 30 samples were analysed by the Borough Analyst. With the exception of 2 informal samples of butter, all were purchased formally under the procedure prescribed by the Food and Drugs Acts. The samples analysed comprised butter (11), bread (6), flour (6), margarine (3), and cheese (4). No adulteration was detected. Formal samples taken (including milk) were in the proportion of 2 per 1,000 of the population, and including informal purchases the proportion of total samples was 2.8 per 1.000.

Unsound Food.—Articles of food seized or voluntarily surrendered in Cambridge Borough comprised :—Beef 4282 lbs (of which 3582 lbs. was voluntarily surrendered), and pork 140 lbs., fish 1344 lbs., cheese 14 lbs., chickens 30, apples 4½lbs., all voluntarily surrendered. There were two prosecutions, both successful. Meat inspection is carried out by an Inspector who holds a special certificate, some of whose visits are paid during process of slaughter and who also attends the cattle market. By this means unsound meat is at once seen and dealt with. In last year's report some details were given as to the working of the Butchers' Vigilance Insurance Society, which has proved of assistance in dealing with unsound meat. Dr. Laird gives the amended rules, of which the principal points are as follows :—(1) On entrance, payment of 5s. per head for all cattle slaughtered upon a weekly average throughout the year, (2) half compensation during the first six months, then the actual price, (3) payment of 6d. per beast slaughtered, but (4) no payment on beasts costing less than £12 or known to be unhealthy or (5) upon any cow or bull slaughtered, and (6) suspected meat to be notified to the Sanitary Authority and immediate intimation of intention to claim compensation is to be made.

In Chesterton Urban District Mr. Dibblin, the Sanitary Inspector, considered the animals slaughtered to be of good quality and that any disease was of small extent. "It was always readily surrendered, and I believe the butchers to be genuinely grateful for their reputations' sake that this meat was destroyed and not exposed for sale, so rendering them liable to prosecution." Mr. Dibblin obtained the Meat Certificate of the Royal Sanitary Institute during the year.

In Chesterton Rural District one tuberculous carcase was condemned and destroyed, as also were parts of a carcase

affected with Actinomycosis. Dr. Armistead states that no unsound food or tuberculous carcases have been found in the Linton and Newmarket Rural Districts during the year, and Dr. Poyntz Wright repeats that he has never seen anything but excellent meat in Caxton and Arrington Rural District. There is now no meat inspection by specially qualified persons in any of the Rural Districts. No reference to meat inspection is made in the reports on the Melbourn and Swavesey Rural Districts.

I was instructed by the Public Health Committee to report upon the means adopted for the protection from contamination of meat in butcher's shops, and, in consequence made inquiries in various quarters concerned. By instructions the report was circulated among butchers in the County. I found that many butchers object to glazed shop fronts on the grounds that a free circulation of air is interfered with, that the shop is hot in summer and the meat consequently does not keep, and that sunblinds and cold storage render glazed fronts unnecessary. On the contrary it was argued in favour of the glazed front that meat is protected from contamination by dust, splashing of dirt and flies, that it keeps better, that handling by purchasers is limited and that through ventilation is quite practicable. Also cold storage is not available in the smaller shops. Wire blinds were not regarded with favour.

I arrived at the following conclusions as regards the protection which it seems desirable to adopt :

1. A glazed shop front.

2. Through ventilation. (The best system observed was an open ironwork grille above the glazed front with an ample opening at the back of the shop.)

3. Sunblinds in summer.

4. Cold storage where practicable.

5. No meat to be hung outside the shop.

6. Application of tar preparations to rural roads.

7. Efficient street scavenging in towns.

PLACES OVER WHICH DISTRICT COUNCILS HAVE SUPERVISION.

Dairies, cowsheds and milkshops are dealt with separately under the heading of Milk Supply.

Common Lodging Houses.—There are 10 within Cambridge Borough, with accommodation for 244 persons. During the year 155 visits of inspection were paid, some 47 defects being detected. The only common lodging house outside the Borough is in Newmarket Rural District.

Houses Let in Lodgings.—Inspections of all property of a working class character known to be let in lodgings have been made in the Borough of Cambridge. The total number of houses known to be let out in rooms is only nine, the occupiers being usually street hawkers or others belonging practically to the common lodging-house class. Rooms are usually let by the night, though some tenants have occupied the rooms for for long periods. "The usual practice is for the tenant to furnish a house to some extent, and let it out to a number of sub-tenants, each of whom takes one room, or in some cases

two rooms . . . The rents charged for the rooms are very high, frequently more being charged for one room than the whole house when unfurnished " Dr. Laird's statement is borne out by the details given regarding individual premises, in one instance, for example, the total rent received being about 20s. per week against a probable rent of 3s. or 4s. in the usual way of letting.

In only two instances was a family found to be living in a single room. Dr. Laird considers that the general sanitary condition compares favourably with cottages in the same neighbourhood, the chief objection being taken to defective ventilation and absence of provision for storage of food. Dr. Laird discusses the applicability of byelaws to property of this character and arrives at the conclusion that rental is practically the only criterion for deciding whether individual houses should come under their provisions; "only those houses would be placed upon the register which were occupied by persons whose habits rendered it desirable that constant sanitary supervision over the premises should be exercised," *i.e.*, persons of the common lodging house type. The total number of persons of this class known to be living in houses let in lodgings at the time of the enquiry was 66; generally speaking it is desirable that persons of this character should be subject to special regulations and supervision, as they are otherwise apt to form foci for the spread of disease of an infectious character.

Movable Dwellings.—Ten inspections of the 8 canal boats on the Borough register were made, no infectious disease being traced and no legal proceedings being required.

No statement is made as to inspection of tents, vans, sheds, etc., except that in Melbourn Rural District 61 inspections of

travelling vans are said to have been made, though in Linton and Newmarket Rural Districts byelaws are in force. Considering the number of " feasts " which take place throughout the County area during the summer months, and the facilities thus afforded for the spread of infectious disease, special reference to the supervision exercised seems desirable. The number of persons enumerated in barns, sheds, caravans, tents, etc., or in the open air was at the 1911 census 30,642 in England and Wales, and 123 in the Administrative County. Doubtless this number is much larger during the warmer weather, at any rate as far as rural areas are concerned.

Factories and Workshops.—Broadly speaking factories are supervised as to their sanitary condition by the Inspectors of the Home Office, the District Councils being mainly concerned with workshops and workplaces. The Local Authority has, however, duties with regard to provision of means of escape from factories in case of fire and regarding closet accommodation.

As far as can be gathered from the reports the number of factories, workshops and workplaces in the County is 1321, viz, Cambridge Urban 504, Chesterton Urban 135 ; Rural Districts, Caxton and Arrington 19, Chesterton 273, Linton 123, Melbourn 72, Newmarket 165, and Swavesey 30. The great majority of these are workshops or workplaces, there being comparatively few factories. The figures given indicate systematic inspection. Lack of cleanliness is the defect most frequently noted, and, less commonly, defective ventilation, defective closet accommodation and overcrowding. No prosecutions are recorded

Note is made of lists of outworkers received from employers and other District Councils in Cambridge Borough,

Chesterton Urban and Rural and Linton Rural Districts, and house workers' premises have been inspected and, where necessary, disinfected. Supervision of such premises is important not only to secure sanitary conditions for the workers but to protect the public from infectious disease which may be readily spread by clothing and similar materials if due precautions are not observed where workers are attacked.

Bakehouses are the subject of special legislation and supervision. There are 210 in the County, 57 in Cambridge Borough and 153 in other Districts. Except in Cambridge Borough there are no underground bakehouses. Supervision has been exercised in all the Districts, but no special matter for comment presents itself.

Slaughter Houses.—There are 24 private slaughter houses in Cambridge Borough, 6 in Chesterton Urban, and 7, 17 and 20 in Caxton and Arrington, Linton and Newmarket Rural Districts respectively. The number in Chesterton, Melbourn, and Swavesey Rural Districts are not given. The number of inspections made is stated for all Districts except Melbourn and Swavesey Rural ; 235 inspections of 24 premises were made in Cambridge Borough and 125 of 6 premises in Chesterton Urban, so that a very thorough supervision has been exercised in these Urban areas. In Rural Districts the inspection is practically annual as far as indicated. The extent of supervision in Melbourn Rural District cannot be judged, as a general total of 77 visits to slaughterhouses, bakehouses, dairies and cowsheds is alone given. In Cambridge Borough Dr. Laird notes that "the premises have undergone considerable improvement, and are structurally in as satisfactory a condition as can reasonably be expected."

Inspections have been made of knacker's yards at Cherryhinton and Willingham in Chesterton Rural (2), Soham and Dullingham in Newmarket Rural (2), and at Balsham in Linton Rural District.

Ice-cream premises are regularly visited in Cambridge Borough, especially during spring and summer when the trade is busiest.

SEWERAGE AND DRAINAGE.

The sewage from the Borough of Cambridge is removed on the separate system, and Chesterton Urban District and the urban portions of certain parishes in the Chesterton Rural District drain, by agreement, into the Borough's system. This system is graded from the several sewer summits in the Borough and District to the Riverside Pumping Station in Barnwell to the north-east of the town, where it is many feet below the river level. Here it is pumped, after screening, through a rising main about two miles long to the sewage farm in the Chesterton Urban District. It is there received into settling tanks and distributed on land under-drained for treatment by intermittent downward filtration. The sewage effluent from the land is discharged by gravitation into the river Cam, a few yards below Baitsbite Locks. The soil, a mixture of loam, sand and gravel, is said to be well adapted for sewage purification, Storm water is treated at the Pumping Station on bacteria beds.

In February, 1912, a Local Government enquiry was held regarding an application for sanction for a loan for the construction of a duplicate rising main between the pumping station and the sewage farm.

Chesterton Urban.—"The sewerage of the district is at the present time adequate for purposes of sewage and storm water, and it is on the partial separate system. The sewers join with the Cambridge system of sewers at the Pumping Station; they are adequately ventilated by manholes in the roadways and by shafts." Manholes are systematically cleansed and sewers flushed at quarterly or half-quarterly intervals. About 77 premises were connected with the sewer during the year.

The great bulk of the County area is of a rural character, and systems of sewerage are few in number. The following notes are mainly taken from the Reports of the Medical Officers of Health for the various Rural Districts.

Chesterton Rural.—"There are properly constructed sewers at Newnham Croft (Grantchester), St. John's Ward and Brookfields (Cherryhinton), and at Hills Road (Trumpington)." These are the sewers which discharge into the Borough system as already indicated. "In the larger villages of Cottenham, Willingham, Waterbeach, Great Shelford and Histon, the surface water drains convey house drainage to the watercourses." Dr. Anningson notes the extension of the main drain at Coton, the remedy of drainage defects at Waterbeach and Willingham, Harlton, Madingley, Quy, Cottenham and Newton, and the laying of a new drain at Comberton. In Cherryhinton and Grantchester 56 houses were connected to the sewers.

Counsel's opinion has been taken during the year on making and sewering Fen Ditton Lane, which figured prominently at the enquiry re extension of the Borough boundaries, and the Surveyor has received instructions to prepare the necessary plans for sewering the road.

Caxton and Arrington Rural.—"None of the villages possess a proper system of sewers with the exception of Gamlingay, the majority having open dykes into which the various cottages drain. They have, however, been examined from time to time and kept clear and clean during the year."

Linton Rural.—Sawston is the only village with a system of sewerage, and additional settling beds at the outfall have been decided upon. At Castle Camps a pipe sewer terminates in a field outside the village. "In the villages of Whittlesford, Babraham, West Wratting and Linton storm-water drains receive sewage, chiefly slopwater." Dr. Armistead is of opinion that a sewerage system in other villages would be unproductive of sufficient benefit to justify the expenditure, and that but little nuisance arises from distribution of slops over garden ground.

Melbourn Rural.—"There is no system of sewerage in the district, but in some of the villages drains are provided which in some instances discharge into the watercourses, and in others into cesspools. The road drains in some of the larger villages have been utilised as slop-water sewers; this is an unsatisfactory method of disposal. Drains discharging sewage into the parish ditch at Fowlmere, and into open ditches at Melbourn and Shepreth have been cut off and cesspools provided."

Newmarket Rural.—"The villages of Soham, Fordham and Burwell" (populations 4,682, 1,410 and 2,144) "have sewers, some of which were originally constructed for storm water drains. In the village of Stetchworth there is a pipe sewer with settling and filtration tanks. The pipe sewer has been extended during the year so that the whole of the main street of the village can now be drained into it." Dr.

Armistead makes the same observations as regards the disposal of slopwater in the rest of the villages as in the case of Linton Rural District.

Swavesey Rural.—"There is no system of sewerage in the district except at Swavesey, where the main sewer has been extended by the side of the brook for a distance of 20 yards past the Station Road Bridge ; it is still a desideratum that the sewage be treated before reaching the natural water course. A portion of the old sewer dyke in Middle Watch has been covered up ; this work is a great improvement."

"Walman's lane ditch has been partly filled up and a socketed pipe drain partially provided, but this work is quite inadequate, as it should be continued to join the extended 'sewer' "

"Over is still making improvements in the matter of drainage, having extended their new 'sewer' down Overcote road, and Glover street."

POLLUTION OF RIVERS AND STREAMS.

The Rivers' Pollution Prevention Acts confer powers upon all local authorities for the prevention of the pollution of rivers and streams within their Districts, while they are themselves forbidden by provisions of the Public Health Act, 1875, to dispose of unpurified sewage in natural streams or watercourses. Under Section 14 of the Local Government Act, 1888, County Councils have power to enforce the provisions of the Rivers' Pollution Prevention Act of 1876. As there are few manufactures in this County, pollution of streams is likely to arise mainly from improper methods of

sewage disposal. There being few sewage systems proper, apart from the central urban area, drained by the Borough system, sewage received into streams in the rural districts chiefly consists of slop-water, which finds its way into streams through storm drains. This is made abundantly clear in the sections dealing with methods of sewage disposal in the reports on the various Rural Districts. There are few water closets, and where not disposed of as just intimated, slopwater is distributed on garden ground, with or without nuisance according to method.

The reports on Cambridge and Chesterton Urban and the Swavesey Rural District contain no reference to this subject.

Caxton and Arrington Rural.—"The Caxton District has no rivers or streams save the small watercourses found in rural areas. As stated in my last report these certainly receive the sewage from houses which are adjacent to them, and it is practically the only place where the sewage can be disposed of."

Linton Rural.—"The river at Linton receives sewage, chiefly slopwater, from the outlet of the drains."

Melbourn Rural.—"The tributary of the Cam called the Rhee skirts the district on the West side, and is the stream most affected by local pollutions, while the tributary called the Granta in like manner skirts the East, but belongs to another watershed, and is therefore little affected ; a considerable area of the Rhee is affected by drainage pollution at Steeple Morden and Guilden Morden. Two other arms are polluted at Litlington, Bassingbourn and Melbourn, and when the intermittent stream at Wardington Bottom is running, pollution reaches the river from Fowlmere also, while the main stream of the Rhee is polluted at Barrington."

Newmarket Rural.—"The rivers and streams receive some pollution from sewage at Soham, Fordham, and Burwell."

Chesterton Rural.—"In several of the larger villages, notably Willingham, Cottenham, Waterbeach, Great Shelford and Histon, the surface water drains convey slop-water to the watercourses. There are no works of sewerage in any of these villages. The effluent from the Cambridge Sewage Farm flows into a ditch and the river near Baitsbite Lock, in the parish of Milton, The drainage from the parishes of Grantchester and Trumpington also finds its way into the Cam."

"A nuisance arose from the foul state of the watercourse at Histon. Samples of the effluent from a factory drain were examined and found to be unfit for discharge into a stream. Notice was served on the owner of the factory to carry out the works necessary to abate the nuisance and prevent its recurrence." I reported upon the possible sources of pollution of this stream to the Education Committee when the site for the Histon Council School was under discussion, and the matter was the subject of correspondence with the Rural District Council.

DISPOSAL OF EXCREMENT AND HOUSE REFUSE.

Excrement Disposal.—Cambridge and Chesterton Urban Districts are almost entirely upon the water carriage system and the sewage from the urban portions of Chesterton Rural District is similarly removed. Where the closets are hand-

flushed, conversion into a cistern flush is being proceeded with. The existence of water closets in better class houses is noted in Chesterton, Melbourn, Caxton and Arrington, Linton and Newmarket Rural Districts. The water supply is pumped to a cistern from a well on the premises and the W.C. contents are conducted to a cesspool (Caxton and Arrington Rural). Difficulty may arise with regard to the disposal of cesspool contents, and Dr. Anningson refers to a sytem of subsoil irrigation from the cesspool for avoiding this difficulty and instances its adoption at Bassingbourn, Melbourn and Shepreth (Melbourn Rural). The same observation applies to slop-water cesspools.

There are but few pail-closets or earth-closets in Cambridge Borough and the Chesterton Urban District, but with the exception of the urban portions of Chesterton Rural District conservancy systems are general throughout the Rural Districts. The proportion of privy pits and pail-closets varies in the different Districts. In Chesterton Rural "the pail system is largely in vogue." In Melbourn Rural, "in most of the villages there are still pit-privies remaining, but the gradual substitution of pail closets is being continued with as much rapidity as possible." In Linton and Newmarket Rural Districts, on the other hand, "the privy system is in general use, but several of the houses have pail closets." The report on Caxton and Arrington Rural is more satisfactory in this respect: "The means for disposal of excreta are pail closets, which are replacing the old privy-midden, very few of which now remain in the District." In Swavesey Rural "excrement disposal is by privy pits, and in many instances by trough or pail closets; the pit privies are being gradually abolished in favour of pail closets; I do not recommend troughs." (Dr. Anningson.) It may also be mentioned here that, as opportunity arises, the County Education Authority

are substituting pail closets for such pit privies as remain on their school premises.

The arguments against the old privy pit are by this time well known, and it is greatly to be hoped that increased knowledge will result in their entire abolition at no distant date. Apart from the unpleasantness and nuisance experienced, the danger arising to health from accumulation of large quantities of human excreta in the neighbourhood of dwellings, the facilities afforded for transmission of preventible diseases by the agency of flies, and the pollution of water supplies are surely arguments weighty enough to stand against some inconvenience and possible expense in the frequent cleansing of pail closets. The common argument of economy in favour of retention of the privy pit is nothing less than an avowal that the desired object is to retain excreta in bulk in the proximity of human beings. On the contrary the accumulation should be as slight and the removal as frequent as possible, health being the first consideration. Systematic disposal in trenches in the garden, and covering over with a few inches only of earth, should be carried out every few days. It cannot be denied that this is an infinitely less unpleasant and degrading proceeding than the removal of the contents of privy pits after the neglect of months. Disposal should be systematic, in the manner indicated, and excreta should not merely be dumped into an open hole in the ground along with household refuse and slops as may be seen near many cottages. Handbills relating to this subject, drawn up in accordance with the instructions of the County Council, are still obtainable from the County Public Health Department.

Disposal of House Refuse.—In the Borough of Cambridge street scavenging and the removal of house refuse are carried out by the Borough Surveyor's department, daily in the centre

of the town and less frequently elsewhere. In Chesterton Urban District house refuse was removed twice weekly, and this was also done in the urban portions of Chesterton Rural District. Throughout the rural portion of the County there is no system of public scavenging, refuse being disposed of by the occupiers on the soil of gardens or allotments. An exception to this which might be copied elsewhere with advantage is at Great and Little Abington, where the owner of the cottages has arranged for removal of house refuse and pail contents twice weekly. (Linton Rural.) In Chesterton Rural District the question of public removal of house refuse from the large villages of Cottenham, Willingham and Fulbourn has been referred by the District Council to the Parish Councils concerned.

In Swavesey Rural District, Dr. Anningson states that ashpits are being abolished and iron ash bins substituted. The use of such sanitary ashbins, properly covered and of limited capacity, is a very desirable improvement. Many cottages in the rural areas have no provision for ashes and household refuse whatever, and it will be remembered that quite recently the Cambridge Borough Council declined to sanction a byelaw which would have substituted this sanitary arrangement for unsatisfactory forms of receptacle.

NUISANCES.

In all the reports a tabular statement of work done by the Sanitary Inspector is given, and information regarding nuisances dealt with is in almost all the reports confined to this source. A large amount of work appears to have been done in the Districts generally, but nothing which calls for special comment. With the exception of one summons and conviction

in the Borough of Cambridge legal proceedings have not been found necessary for the remedy of nuisances, unless two successful prosecutions in Chesterton Rural District for permitting the occupation of new houses without a water certificate be included under this heading. In the great majority of cases an informal intimation notice is found sufficient for remedy, but if not, statutory notices are served.

BYE-LAWS AND ADOPTIVE ACTS.

Adoptive Acts.—The Infectious Diseases Prevention Act, 1890, may be adopted by both urban and rural authorities. Its provisions chiefly relate to the inspection of dairies and cattle outside the district of a Local Authority for the prevention of spread of infectious disease, to the disinfection of premises, bedding and public conveyances, and to the provision of temporary shelter for tenants during house disinfection. It has been adopted in the Borough of Cambridge, Chesterton Urban District, and in the Chesterton and Melbourn Rural Districts. In the Caxton and Arrington and Chesterton Rural Districts, Acute Poliomyelitis and Cerebro-spinal Meningitis were added to the diseases compulsorily notifiable under the Infectious Disease Notification Acts.

The most important provisions of the Public Health Acts Amendment Act, 1890, relate to sanitary appliances, structure and site of new buildings, and the sale of food. Part III. has been adopted in the Borough of Cambridge, and in the Chesterton Urban District, and so much of this part of the Act as applies to a Rural District has also been adopted in the Chesterton and Linton Rural Districts.

The Public Health Acts Amendment Act, 1907, is mainly concerned with the paving of yards, the proper connection of rainwater pipes, the substitution of water-closets for privies, offensive trades, and the spread of infectious diseases in milk (not tuberculous milk). Certain of its provisions have been adopted in the Borough of Cambridge, the Chesterton Urban District, and for the parishes of Cherry-hinton, Grantchester, Trumpington, Fen Ditton and Fulbourn by the Chesterton Rural District Council.

The Notification of Births Act, 1907, is in force in the Borough of Cambridge.

Byelaws and Regulations.—Regulations under the Dairies, Cowsheds and Milkshops Orders are in operation in all the Districts in the County. Byelaws as to slaughterhouses are in force within the Borough of Cambridge and the Chesterton Urban District. Tents, vans, sheds and similar structures are regulated by the model Byelaws in Linton and Newmarket Rural Districts, and lodgings for pickers of fruit and vegetables by byelaws in the Chesterton Rural District. Common lodging-houses are controlled by byelaws in the Borough of Cambridge and in Newmarket Rural District, the only Districts in which buildings of this character are situated. The question of the adoption of byelaws regulating houses let in lodgings is raised in the report on Cambridge Borough.

Byelaws relating to nuisances, cleansing of footways and pavements, rainwater pipes, and the drainage of buildings are in force in the Borough of Cambridge, as also in Newmarket Rural District (parishes of Cheveley and Woodditton) with respect to cleansing of footways and pavements, removal of house refuse, and the cleansing of earth closets, privies,

ashpits and cesspools, and in Melbourn Rural District with regard to the disposal of house refuse. The Borough Council decided against a byelaw relating to movable ash bins.

Building byelaws are in operation in Cambridge and Chesterton Urban Districts, Chesterton Rural (urban parishes of Cherryhinton, Grantchester, Trumpington and Fen Ditton), and in Newmarket Rural District (parishes of Cheveley and Woodditton). In the other Rural Districts and the other parishes of the Chesterton and Newmarket Rural Districts there is no direct supervision over new buildings.

In March, 1911, an additional byelaw relating to new buildings was approved for Cambridge Borough, exempting from the operation of the byelaws regarding to new streets and buildings and to the drainage of buildings any building which might be erected by the Council for the reception of cases of pulmonary tuberculosis.

Consideration was given by the County Council during 1911 to the formation of a byelaw prohibiting spitting in public places, and a byelaw with that object was eventually made in 1912, which will be operative in all parts of the County with the exception of the Borough of Cambridge. The latter authority considered a similar action in 1911, but resolved against a byelaw.

SCHOOLS.

In the area under the control of the Cambridgeshire Education Committee the duties of School Medical Officer are performed by the County Medical Officer, with the assistance of a whole-time Assistant School Medical Officer,

Dr. Eva McCall. Apart from the Borough of Cambridge, where the Medical Officer of Health is also School Medical Officer to the Cambridge Education Committee, the District Medical Officers of Health do not carry out inspection of scholars under the Elementary Education (Administrative Provisions) Act, of 1907.

The Annual Report prescribed by the Board of Education on the methods and results of medical inspection of children attending Public Elementary Schools, which is submitted to the Education Committee, includes a section on the hygienic conditions prevalent in these schools. The premises of 56 out of a total of 140 schools were the subject of special report to the Buildings Sub-Committee by the School Medical Officer during the year. Such reports are usually made the subject of direct communication with the School Managers, reference being made to the County Architect, Mr. H. H. Dunn, A.R.I.B.A., in the case of Provided Schools. The Local Sanitary Authority are communicated with where co-operation appears desirable.

The following information as to water supplies to the schools is taken from my annual report as School Medical Officer. The Education Authority's area for Elementary Education being of a rural character, water is piped to comparatively few schools, 17 out of 112 recorded, and even then is not always laid on over lavatory basins. It has been piped to the interior of two Council schools during the year. Twenty schools have wells and 16 obtain water from school-house wells. Probably most of these are of no great depth, but deep borings have been or are being made at Shepreth and Meldreth Council Schools and one is approved for Lode Council School.

Four schools depend entirely upon rainwater, and 55 have no water supply upon the premises. Water is conveyed by hand to 40 of these from public wells, to 12 others from wells on private premises. Some of these wells are at such a distance that only the minimum requirements are likely to be fulfilled. Three schools depend upon streams, but a deep boring is being sunk for the supply of one of them.

As few villages have water pipes to the houses there are few water-closets in the schools. The closets are, therefore, of the pail or privy pit type, the former predominating and being substituted for pits as opportunity arises. To avoid nuisance arising from liquid contents of pails, Mr. Dunn has submitted a design which has been approved by the Education Committee for the new Council School at Histon.

During the year a circular of notes on school sanitation was issued by the School Medical Officer for the information of School Managers, copies of which are still obtainable.

The measures adopted by the Education Authority for the control of Infectious Disease are included in the following summary :—

Systematic notification by Head Teachers to the School Medical Officer and District Medical Officer of Health of all absentees on account of infectious diseases, and exclusion (under Regulations) of scholars infected or belonging to infected households.

Notification by the School Medical Officer to the Medical Officer of Health of all cases of infectious disease excluded by him during the course of medical inspection, and of all school closures advised by him. The School

Medical Officer certified for closure on 37 occasions (30 for measles or whooping cough), and 28 closures by the Local Sanitary Authority were notified.

Special inspections of schools, where necessary, on the occurrence of infectious disease among scholars, and consultations as to closure. During 1911, 58 special visits were paid in connection with infectious disease.

The provision of bacteriological diagnosis of diphtheria among school children, and the exclusion of "carrier" cases from school.

Instruction on infectious diseases to teachers, by means of printed matter included in the Regulations.

The issue of leaflets of information for distribution to parents on the outbreak of measles and whooping cough.

The notes on schools in reports of the District Medical Officers of Health do not call for special reference here.

METHODS OF DEALING WITH INFECTIOUS DISEASE.

Cases of infectious disease are notified by the medical attendant to the District Medical Officer of Health, under the provisions of the Infectious Diseases Notification Acts of 1889 and 1899. These Acts relate to certain specified diseases which do not include such common infectious diseases of childhood as measles and whooping cough, unless added by resolution of the Local Sanitary Authority and approved by the Local Government Board. Medical Officers of Health

have since January, 1911, been required by the Local Government Board to send a weekly list of the number of notified cases of each notifiable infectious disease to the Board and to the County Medical Officer, and a weekly summary showing the number of notifications received in each sanitary district throughout the country is circulated by the Local Government Board.

The customary procedure on the receipt of a notification by the District Medical Officer of Health is for a visit of enquiry to be made by the Sanitary Inspector or Medical Officer. Printed notices of precautions are commonly left with the householder, and disinfectants are supplied. The case may or may not be removed to the Isolation Hospital, according to circumstances, and after removal or at the termination of the case the house and contents are disinfected.

The procedure for dealing with infectious disease in the County Schools has been detailed in the preceding section. In Cambridge Borough the School Nurse visits cases notified by the Teachers, and the Medical Officer of Health issues the necessary instructions upon her report.

Disinfection. (*a*) *House.*—The precise method adopted is not always indicated in the reports for the respective Sanitary Districts, but in my last year's report a summary of the results of a special enquiry was given. Formalin is employed by all the Local Authorities, the spray being usad in the Cambridge and Chesterton Urban Districts and in the Chesterton, Linton and Melbourn Rural Districts. The lamp is used in the remaining Districts, but the spray in the more effective method. Sulphur fumigation is, in itself, practically useless. Chlorine gas is occasionally employed at Linton.

(*b*) *Bedding and Clothing.*—Steam disinfection is undoubtedly the most valuable method, and reliance cannot be placed on the disinfection of bulky articles, such as bedding, by any other method. Steam disinfection is confined to Cambridge Borough (Sewage Pumping Station), Chesterton Urban, Chesterton Rural (Hospital) and Melbourn Rural District (Isolation Hospital). It is not carried out by the Caxton and Arrington, Linton, Newmarket and Swavesey District Councils, articles being exposed to formalin gas during house disinfection. The adoption of steam disinfection by these Authorities has been recommended by the County Council.

I would again emphasise the extreme importance of thorough scrubbing and cleansing of the surfaces of infected rooms and articles as being an essential feature of house disinfection, and also of the disinfection of the patient before he is allowed to mix with other people, Supervision of such matters is more difficult in scattered rural areas than in the case of an urban population, but any relaxation is attended with danger of prolonging outbreaks of infectious disease.

Bacteriological Diagnosis.—The arrangement entered into in 1910 by the Education Committee for the examination by Dr. Graham Smith of school swabs for diphtheria was continued through 1911. Altogether 156 swabs were taken from the Public Elementary Schools by the School Medical Staff during 1911.

Arising out of my Annual Report for 1910 an enquiry was made as to the provision made by the District Councils for bacteriological diagnosis with the following results.

Diphtheria.—Arrangements made by all the Local Authorities. Children excluded from school because proved bacteriologically to be diphtheria "carriers" require further bacteriological examination before their school attendance can be resumed with safety to other children, and in the absence of such provision the readmission of such children cannot be properly controlled. Such examination in the homes would come within the province of the Sanitary Authority and provision is said to be made by all District Councils but does not appear to be invariably put into practice. To avoid taking up the time of the Medical Officer of Health a small fee could be paid to private practitioners, and this is said already to be done in Cambridge Borough, and in the Chesterton, Melbourn and Swavesey Rural Districts. The Caxton and Arrington Rural District Council have recently adopted this recommendation.

Enteric Fever.—Provision made only by Cambridge Urban and Linton and Newmarket Rural Councils. It is very unfortunate that the very small expenditure involved, which might almost be reckoned in shillings, should stand in the way of the accurate diagnosis of a dangerous and insidious disease of this character. Considering the indifferent water supplies and facilities afforded for their pollution by human excreta in parts of the county, no reasonable facility for accurate diagnosis should be withheld.

Tuberculosis.—Provision for bacteriological examination of human sputum is made by the Cambridge Borough Authority (milk also), and by the Linton, Melbourn, and Newmarket District Councils. If the campaign now inaugurated under the provisions of the National Insurance and Finance Acts of 1911 is to be successful, the accurate diagnosis of pulmonary tuberculosis in the early stages is of the utmost

importance, even taking into consideration other modern methods of early detection. Provision should undoubtedly be made for bacteriological examination.

Water.—Cambridge Urban and Linton and Newmarket Rural Districts have made bacteriological provision regarding water samples. Special reference would be required in other districts.

Food Poisoning.—Outside the Borough special reference would be required in each case, and I would refer to the following quotation from a recent Memorandum of the Local Government Board. "It is of obvious advantage that arrangements for any necessary bacteriological examination should have been considered beforehand and the delay and trouble of making special emergency arrangements avoided." This would apply equally to water examinations.

Provision of Diphtheria Anti-toxin.—The provisions of the *Diphtheria Anti-toxin (Outside London) Order* were summarised in last year's Report, and in answer to enquiries since made I am informed that anti-toxin is supplied for the poorer inhabitants by all the District Councils in the County. In Cambridge and in the Caxton and Arrington Rural District both prevention and treatment are provided for, in Linton and Newmarket Rural Districts treatment only, and in Chesterton, Melbourn and Swavesey Rural Districts prevention only. Anti-toxin is being increasingly used for the protection of other members of an infected household, and its undoubtedly great curative value (as shown by the reduction of mortality in the hospitals of the Metropolitan Asylums Board from 30 to less than 10 per cent.) affords strong reason for its supply to the poorer inhabitants in the interests of the

whole community. It is gratifying that all the Local Sanitary Authorities undertake the supply of anti-toxin, but it is desirable that it should be available for both preventive and curative purposes uniformly throughout the County.

Plague.—Interest attaches to this subject owing to the deaths in 1910 in the adjoining County of Suffolk suspected to be due to pneumonic plague. No suspicious cases were reported in this County in 1910-11 and no further cases are known to have occurred in Suffolk.

The Suffolk outbreak is dealt with in detail in the last report of the Medical Officer to the Local Government Board. Bacteriological investigations shewed that rodents were definitely infected with plague, the bacillus being found in dead rats and also in hares. Evidence of mortality from this cause was found in eight Sanitary Districts in the neighbourhood of Ipswich, but a large number of rats examined from other parts of Suffolk all gave negative results, as also did rats sent to the Board from Districts in Cambridgeshire. Also there was no exceptional incidence of pneumonia in the Eastern part of this County in 1911.

The evidence collected appears to indicate that rat-plague has been present for several years in Suffolk, probably introduced from grainships by infected rats. As only three limited outbreaks of a suspicious character have occurred during that time Dr. Newsholme considers that human infection may be regarded as an exceptional occurrence. At the same time the possibility of its communicability to man by the rat flea in this country, though relatively much less likely than in India, may be regarded as strongly indicated, and it is significant that the Suffolk cases occurred in uncleanly surroundings.

The measures taken for rat destruction in certain Districts in this County were detailed in my last report, and were continued in the Eastern portion with considerable diligence during the early part of 1911. In considering the methods adopted in Suffolk, Dr. Newsholme concludes that though the complete destruction of rats in a district may be regarded as a counsel of perfection, their thinning out, if maintained, diminishes risk to mankind. Netting of the ricks during threshing is alluded to as an important precaution which is often neglected. Arsenic and strychnine were largely used during the recent operations and also phosphorus preparations, but barium carbonate is indicated as the least objectionable mineral poison. The degree of success attending the use of virus preparations varied with the individual preparation and with the potency of different samples, Ratin apparently being the most successful.

ISOLATION HOSPITALS.

The proportion of cases of scarlet fever, diphtheria and enteric fever removed to Isolation Hospitals throughout the County area was 75 per cent. of 594 cases of scarlet fever, 42 per cent. of 117 cases of diphtheria, and (including cases treated in Addenbrooke's Hospital) 45 per cent. of 20 cases of enteric fever. The number of cases of each disease removed from each Sanitary district is given in Table II.; the percentages are as follows—

Scarlet fever.—Cambridge Borough 90, Newmarket Rural 86, Chesterton Rural 62, Melbourn Rural 57, and Chesterton Urban 21 per cent.

Diphtheria.—Cambridge Borough 93, Newmarket Rural 66, Chesterton Rural 7 per cent., and Chesterton Urban 3 of 5 cases.

Enteric Fever.—Chesterton Rural 6 of 10 cases to Addenbrooke's Hospital, Newmarket Rural 2 of 3 cases to Isolation Hospital, Cambridge Borough 1 of 3 cases treated in Addenbrooke's Hospital.

Districts in which cases of infectious disease occurred, none of which were removed to hospital were :—Scarlet fever, Caxton and Arrington, Linton and Swavesey Rural; Diphtheria, Caxton and Arrington and Linton Rural; Enteric fever, Caxton and Arrington and Melbourn Rural.

I would again emphasise the point that an isolation hospital is primarily an essential part of the machinery for the prevention of spread of infectious disease, and only secondarily an institution for its treatment. It follows therefore that satisfactory results may only reasonably be looked for where the earliest cases are removed to hospital as they arise. Though some cases may no doubt be satisfactorily isolated in the home, this is comparatively seldom practicable in working-class houses, and a policy which limits the hospital isolation of such cases or delays it until the disease has spread is not in the interests of the public health and does not enable the hospitals to fulfil their proper useful function.

By the Order of 1910 which prescribes his duties, the County Medical Officer is required to enquire into and report upon the Isolation Hospitals of the County from time to time and also as to the need for further accommodation. It has been the practice in this County for the Medical Officer to make an annual report on each hospital for which an annual grant is made by the County Council. By resolutions of the Council passed in 1903 and 1904 such an annual grant is made for structures of a permanent character, for which a loan was sanctioned by the Local Government Board. Where

the structure is of a temporary character, or the cost of its erection has not been defrayed by loan, a lump sum has been contributed by the County Council, but no annual grant has been made. When reporting in 1911 I was instructed in future reports to include a statement as to available air space per patient, and this was done in reports made in February, 1912.

Concisely stated, the position as to isolation accommodation in the various Districts is as follows :—

Borough of Cambridge.—Borough Infectious Diseases Hospital, Mill road, Cambridge, provided by the Town Council. A permanent structure, with 36 total available beds, in which three diseases can be treated concurrently. Annual grant made by County Council. For smallpox, two temporary pavilions with tents, Coldham's Lane, Chesterton Rural District, provided by Town Council—no grant.

Chesterton Urban.—No hospital—cases accommodated in Borough Hospital. Now included in Cambridge Borough.

Chesterton Rural.—Chesterton Rural Isolation Hospital, Oakington, in the Rural District. Provided by the District Council. Permanent administration block and temporary ward pavilion with cubic air space for 6 patients. Lump sum contributed towards erection—no annual grant. For smallpox, no special provision ; District Council would use an adjoining field.

Caxton and Arrington Rural.—A temporary structure originally erected for smallpox by the District Council near the St. Neots Road in the Rural District—not yet used for any purpose. No annual grant—lump sum contributed. Arrangement with Biggleswade (Beds) Isolation Hospital for reception of cases.

Linton Rural.—No provision of any kind yet made.

Melbourn Rural.—The Melbourn, Royston and Ashwell Joint Isolation Hospital, Garden Walk, Royston (Herts.), for Royston Urban (Herts.) and Ashwell Rural (Herts.) and Melbourn Rural (Cambs.) Districts. Permanent structure for which annual grant is made. Total available beds stated as 16, but air space for 8 on 2,000 cubic feet basis. Can accommodate one disease. No provision for smallpox; accommodation on Isolation Hospital site suggested.

Newmarket Rural.—Joint Isolation Hospital for Newmarket Rural and for Moulton Rural District (W. Suffolk) at Exning in Newmarket Urban District. Permanent structure with accommodation for 16 patients,—three diseases concurrently treated. Annual grant made. No provision for smallpox; the Council would clear the Isolation Hospital for the purpose.

Swavesey Rural.—No hospital. Arrangement with Chesterton Rural District. No provision for smallpox.

Cambridge Borough Isolation Hospital.—In my report of February 1912, recommending the payment of the annual grant, the accommodation on the 2,000 cubic feet per patient basis (Local Government Board) was stated as :—Scarlet fever 12, enteric fever 6, diphtheria 8, private 7, observation 3, total 36. Increased accommodation is called for, as the population as estimated at the 1911 census was 40,028 and the boundaries have since been extended. A Local Government Board enquiry has been held (1912) in connection with a proposed loan for purchase of land for extension of the hospital.

There is no steam disinfector on the premises, and all articles have to be conveyed to the sewage pumping station, an inconvenient arrangement which is liable to limit disinfection for internal purposes of the hospital.

Melbourn, Royston and Ashwell Joint Isolation Hospital. On inspection in February, 1912, various structural improvements were noted and the appointment of an additional nurse. The actual number of beds in the one ward pavilion was 16, but the total air space suffices for 8 patients only, and only one disease is accommodated. As the total population served is 16,417, the accommodation is not adequate on a population basis. The payment of part of the annual grant was deferred until the approach to the hospital was put in good condition.

Newmarket and Moulton Joint Isolation Hospital.—The payment of the annual grant was recommended after inspection in Febuary, 1912, and improvements to ventilation, etc., were noted. There were 28 beds in the hospital, although the air space only suffices for 16, viz., scarlet fever 7, diphtheria 4, enteric fever 3, observation 2. The census estimates give the populations served as Newmarket Rural 19,865, Moulton Rural 2,256, total 22,121. The number of beds provided is insufficient on a basis of population.

Chesterton Rural Isolation Hospital.—Application being made for an annual grant for this hospital, I reported, as instructed, in February, 1912. The ward pavilion is a good temporary structure, which contained 17 beds, though the cubic space is only slightly in excess of that which would suffice for 6 patients on the Local Government Board basis. As the population exceeds 20,000 the accommodation is clearly inadequate, and only one disease can be treated. This mean

that only scarlet fever is admitted. In my opinion it would be unsafe to accommodate diphtheria cases in vacant rooms in the administration block. Also, to have scarlet fever cases living in the same building as the staff involves risk of spread of infection. Only one out of 14 cases of diphtheria was isolated in hospital during 1911, and increased accommodation which would enable this disease to be dealt with is desirable. No trained nursing staff is employed in the hospital. I reported that "proper conditions to be attached to a maintenance grant would be increased accommodation of a permanent character and the employment of a trained nursing staff."

Caxton and Arrington Rural District.—A temporary structure of one pavilion (two wards, bedroom for one nurse, kitchen) with an ambulance shed, was erected in 1902 for small-pox, but has not been used for any purpose. The Medical Officer of Health has discretionary powers to send cases of enteric fever, diphtheria, or scarlet fever to Biggleswade Isolation Hospital.

Linton Rural District.—No provision of any kind having been made, the District Council were informed that unless action were taken the County Council would consider the taking of steps under the Isolation Hospitals Acts. A conference between delegates of the District Council and the County Public Health Committee followed, and the matter is under consideration by the District Council.

ISOLATION OF SMALL-POX.

Vaccination.—Dealing with the large amount of work involved in tracing contacts during the localised outbreaks in London in 1911, Dr. Newsholme says in his report to the Local Government Board :—"This illustration serves to show that

the security of the public against the spread of smallpox depends upon a somewhat slender thread. The success hitherto achieved . . . is remarkable, but the slowly diminishing protection of the population by vaccination is a necessary cause of disquietude for the future. This is especially the case in certain districts in which the proportion of unprotected children is becoming large. Medical Officers of Health know the danger which under these circumstances will be run, when the early cases in an outbreak are overlooked or the contacts with them cannot be traced."

In last year's report I gave the results of an enquiry into the vaccinated state of the infant population of the County, which shewed the rapid decrease in the number of successful vaccinations per 100 births from year to year. The following figures of percentages of certificates of "conscientious objection" or statutory declaration per 100 births in 1909 present the same case from a different point of view. The percentages for the different Poor Law Unions are :—Cambridge 53.6, Caxton and Arlington 29.5, Chesterton 39.6, Linton 24.1, Newmarket 33.6, Royston 34.3, St. Ives 30.2. The figures for Royston and St. Ives are given, as these Unions include Melbourn and Swavesey Rural Districts. The actual percentages of infants born during 1909 and recorded as unvaccinated during 1910 are :—Cambridge 55.0, Caxton and Arrington 31.8, Chesterton 42.2, Linton 27.8, Newmarket 37.7, Royston 34.9 and St. Ives 30.8 per cent.

The foregoing figures are from the latest published returns of the Local Government Board, but Dr. Armstead gives a later return of "conscientious" objections for Linton, viz., 30 per cent. of children born during 1910, a further advance of about 6 per cent. on the previous year. Dr. Anningson gives figures for Melbourn Rural District, which shew that exemp-

tions were obtained for 33 per cent, of the 165 children born during 1911. Dr. Laird also gives recent figures for Cambridge Borough obtained from the Vaccination Officer which show that exemptions in 1909, 1910 and 1911 numbered 470, 472 and 439 respectively, and he remarks that " for the first time since the passing of the Vaccination Act, 1907, the number of exemptions granted does not exceed that of the previous year." Such an amendment is greatly to be desired, as the above table shews that exemptions in Cambridge have been in a much higher proportion than in the rest of the County. It is also to be noted that the percentage of successful vaccinations during the first half of 1911 in the Borough was 34.2 against 32.8 in 1910.

Corroborative evidence of the decrease of vaccination of recent years is also furnished by the record of the vaccinated state of children noted during routine medical inspection in the Public Elementary Schools in the County Education area. The percentage of all children examined who showed no vaccination scars was 6.3, 8.2 and 9.8 in 1909, 1910 and 1911 respectively, the figures for corresponding years for children ranging from three to six years of age being 6.7, 8 and 12 per cent. respectively.

It is clear therefore that the practice of withdrawal of infants from vaccination prevails to a disquieting extent in this County, and the provision of accommodation for the isolation of cases of smallpox is one of great importance. The following paragraphs from a special report presented to the County Council during 1911 epitomise the existing arrangements and indicate their unsatisfactory nature.

" While Cambridge Borough and the Caxton and Arrington Rural District have each erected a hospital for

smallpox cases, and Chesterton Urban District has arranged with the Borough for the reception of cases when possible, the remaining five Rural Districts have no definite arrangement. As regards the Caxton Isolation Hospital, it is doubtful whether the limited accommodation for staff would permit of safe and efficient administration.

"Certain Districts have no hospital accommodation whatever, and the proposal of others to use their existing hospitals for smallpox would deprive the Districts of accommodation for other infectious diseases at a time when it might be urgently needed, besides involving delay in the admission of the early cases. Strong objection exists to accommodating smallpox on sites adjoining existing isolation hospitals. Such a procedure would be fraught with danger, and would violate the principles advocated by the Local Government Board."

Reference is made to the accommodation in individual Districts in the epitome of hospitals given earlier in this section. The principle advocated in the special report was the reception of cases of smallpox in a central hospital for the whole County, on grounds of efficiency, economy and practicability, and the site occupied by the Borough smallpox hospital was indicated as meeting these requirements. The recommendation finally made was "that under the auspices of the County Council a joint scheme be arrived at by the whole of the Local Sanitary Authorities within the County area for the prompt removal and isolation of smallpox cases. With the agreement of the Borough Authority it would be a matter for consideration whether the temporary chacracter of the existing hospital should be maintained, or whether a portion of a more permanent character should be constructed."

The Public Health Committee resolved to recommend the adoption of this recommendation by the County Council, and the report was eventually adopted by the Council. The matter was not proceeded further with, as it was to some extent dependent upon provision made for pulmonary tuberculosis, which was deferred until the provisions of the National Insurance Act were better known. It is inadvisable that definite action should be long delayed.

METHODS OF CONTROL OF TUBERCULOSIS.

The year 1911 was a notable one in the history of tuberculosis as the year in which all cases of pulmonary tuberculosis were made compulsorily notifiable, and in which greatly enlarged machinery for its prevention and cure was made available by the provisions of the National Insurance Act and the Finance Act of 1911.

The principle of compulsory notification was first introduced with regard to Poor Law cases by the Regulations of 1908, and was extended to hospital patients by the Public Health (Tuberculosis in Hospitals) Regulations of March, 1911, thus reaching a class many of which are not far removed from Poor Law cases in the necessity for their supervision. Finally the Public Health (Tuberculosis) Regulations, 1911, were issued, which came into force on January 1st, 1912, under the provisions of which all cases of pulmonary tuberculosis must now be notified, with the exception of those dealt with under the earlier Regulations and certain specified institutions.

It is now the duty of the medical attendant to notify his diagnosis of pulmonary tuberculosis within 48 hours to the Medical Officer of Health, a similar obligation resting on

School Medical Inspectors as regards cases detected in public elementary schools. The District Council is required to provide the necessary forms and to keep a register of notifications, which is to be open to inspection by specified persons, including School Medical Inspectors and the County Medical Officer.

The Local Authority are, through their officers, required to make such enquiries as are necessary into notified cases, and to take steps for the prevention of the spread of infection. For the purposes of all the Tuberculosis Regulations, they may supply all such medical or other assistance, facilities and articles reasonably required for detection, prevention of spread and removal of conditions favourable to infection, may appoint officers for these purposes, and may furnish printed information for the education of the public as to precautionary measures. Under these provisions, for example, the District Council may supply disinfectants, sputum bottles and paper handkerchiefs for dealing with infective sputum, and also open-air shelters to ensure a fresh air life and separate sleeping accommodation.

By reason of the limited infectivity of tuberculosis as compared with other notifiable infectious diseases (proper precautions being taken) no person notified is to be liable to restrictions or disabilities as regards his personal liberty, occupation or residence.

The steps taken by the Local Sanitary Authorities for dealing with pulmonary tuberculosis have been the subject of special enquiry, the results of which are summarised as follows :—

Visitation of homes.—By sanitary officers in all Districts ; by Health Visitors in Cambridge Borough.

Printed instructions.—To infected houses in all Districts ; placards for public houses, etc., in the Cambridge Borough.

Disinfection of Rooms.—In all Districts after death, in some after removal or on request or in Poor Law cases. Periodic disinfection during life is also desirable.

Bacteriological examination of sputum.—In Cambridge Borough, and in Linton and Newmarket Rural Districts ; also recently in Melbourn Rural District.

Sputum boxes or pocket spittoons.—In all Districts except Linton and Newmarket Rural. (Melbourn Rural about to.)

Paper handkerchiefs.—Cambridge Borough.

Disinfectants.—In all Districts.

Open Air Shelters.—Cambridge Borough (lend from Isolation Hospital), Chesterton, Melbourn, and Swavesey Rural Districts. A shelter recently presented to Caxton and Arrington Rural by Miss C. Cochrane.

Hospital provision.—In Cambridge Borough Isolation Hospital only ; six beds available when vacant ; 16 cases admitted during 1911.

In Cambridge Borough also the examination of other persons in infected houses has been carried out by a specially appointed practitioner, who detected two early cases of phthisis among the 32 persons examined. Of 45 phthisical persons kept under observation by the Health Visitors, 18 were found to be occupying the same bed, and 23 the same bedroom, as other persons. It is encouraging to note that only two patients were reported not to be taking any precautions to prevent infection of others.

Under the National Insurance and Finance Acts of 1911, important facilities are afforded for the prevention and treatment of tuberculosis of insured persons in their homes or through dispensaries and sanatoria. Funds equivalent to 1s. 3d. per insured person in their area are placed in the hands of the Local Insurance Committee for the provision of "sanatorium benefit" for insured persons, and the Committee may include their dependants in the benefit and the County Council and Treasury may make up in equal shares any excess expenditure thus incurred. In addition to payment for home treatment the Committee may contribute to the maintenance of dispensaries and sanatoria out of the sanatorium benefit funds.

For the erection of dispensaries and sanatoria a sum of £1,500,000 is provided, which it may be presumed will be distributed on a population basis. Grants not exceeding £90 per bed are recommended to be made up to three-fifths of the cost of erection and equipment of sanatoria, and up to four-fifths of the amount required for dispensaries, not exceeding £1 per 750 population for the latter purpose.

Though primarily intended for the benefit of insured persons, it is urged that the machinery thus set up be on a scale sufficient to deal with the whole population. Both the Local Government Board and the Departmental Committee on Tuberculosis are of opinion that it can best be utilised by Local Authorities, and indicate County Councils as the most appropriate bodies to set up and maintain dispensaries and sanatoria. Parliament will be asked to provide half the cost of maintenance for non-insured persons.

The following quotations from my recent special report on this subject sufficiently indicate the objects of the dispensary and sanatorium.

"The object of a dispensary system is to provide a common centre for the accurate diagnosis of pulmonary tuberculosis, and to organise treatment. Notified cases referred to the dispensary by the Local Insurance Committee or the Sanitary Authorities, and from other sources, would be seen by an expert medical staff, who would decide as to their fitness for treatment at home or in an institution. The dispensary officer would be available for home visitation in consultation with the medical practitioner in charge. This would lead to the detection of other cases among relatives, and persons who suspected themselves to be infected would come to the dispensary for an expert opinion.

"Patients would be drafted to the sanatorium from the dispensary. A period of sanatorium residence presents a two-fold advantage : (*a*) the practical education of the patient as to how to live with benefit to himself and safety to others, and (*b*) the commencement of special treatment (as by tuberculin), which can subsequently be continued at home under dispensary supervision. Both objects can be achieved in about six weeks, and there can be no doubt that a short period of sanatorium treatment on these lines would be of the greatest value to a large number of cases."

For purposes of economical and effective administration a combination with the County Councils of the Isle of Ely, Hunts. and Beds. was recommended, and on consideration of the report the County Council resolved to invite these authorities to meet them and discuss the matter. An informal discussion with representatives of the Isle of Ely and Hunts. Councils had been held at an earlier date.

There is at present no sanatorium or public tuberculosis dispensary within the County, and the small rural isolation

hospitals are not adapted for the isolation of advanced cases. The Borough of Cambridge have from time to time isolated advanced cases, but now find the accommodation in their Isolation Hospital insufficient for their needs. The Small-pox Hospital near Caxton is not readily accessible and otherwise appears unsuitable. The Borough Small-pox Hospital provides practically the only accommodation for smallpox in the County, and may at any time be required for that disease.

The proposed byelaw for the prevention of spitting in public places referred to in last year's report has since been passed by the County Council and approved by the Local Government Board. It is hoped that this will act as a deterrent and also have an educational influence on the general public. As the danger of infecting healthy persons which arises from promiscuous spitting by consumptives can be readily prevented by the use of a portable spit bottle, no hardship is inflicted by such a regulation.

ADMINISTRATION OF THE MIDWIVES ACT.

In Cambridgeshire the County Council are the Local Supervising Authority under this Act ; their duties have not been delegated to the District Councils. The County Medical Officer advises the Midwives Act Committee, who also employ the services of Miss A. Wilson, a fully-trained nurse and certified midwife, in the capacity of Inspector. The midwives are visited quarterly by the Inspector, and by the Medical Officer or Inspector as special occasion arises. Routine inspections numbered 244 during 1911, and in addition about 50 special investigations were made.

The County Council supply the midwives from time to time with copies of the Rules of the Central Midwives Board,

and with printed information as to procedure in cases of ophthalmia and puerperal septicæmia. The Council has also issued pamphlets of advice to expectant mothers and as to infant management, which are distributed by midwives among women who engage their services. The latter pamphlet was revised during the year and the Council also approved the supply of forms for the notification of the various occurrences which it is the duty of the midwife to notify under the Rules of the Central Midwives Board.

The number of midwives who notified their intention to practise, as required by the Act, during successive years was as follows :—

		Trained.	Untrained.	Total.
January	1906	24	42	66
,,	1907	24	42	66
,,	1908	27	35	62
,,	1909	22	29	51
,,	1910	23	24	47
,,	1911	31	22	53
,,	1912	41	20	61

These figures only indicate the number who fulfilled the statutory obligation to notify during the month of January. The actual number of women who notified and practised during some period of 1910, and therefore came under supervision, was 70, but some of these only practised for short periods. Of the 70, 58 were still practising in January, 1912, the remaining 12 names having been removed from the County Register for the following reasons :—

Resigned practice	1
Left district	9
Will not practise during 1912	1
Failed to notify intention	1

The 61 midwives now practising include District Nurses appointed by Nursing Associations newly organised during 1911 at Soham, Dullingham, Castle Camps, New Cherryhinton and Comberton. The Ashwell (Herts) Association's nurse now attends in Odsey.

The decrease in the number of untrained women and the increase in the number of those who have passed the examination of the Central Midwives Board, which was noted in the report for 1910, has been maintained. The number of trained women now practising, viz., 41, shews a considerable increase on the average number for the preceding five years, viz., 30.

From entries in the midwives' registers, it appears that 974 labours were attended by midwives during 1911 independently of the supervision of a private practitioner. As 2,568 births were notified in the County during that period, 37 per cent. of confinements were attended by midwives only, the same proportion as during 1910.

The number of notifications received from midwives in accordance with the Rules of the Central Midwives Board is given below, the figures for preceding years being also furnished for purposes of comparison.

NOTIFICATIONS :

	1907.	1908.	1909.	1910.	1911.
Medical help advised for mother	61	51	57	67	117
Medical help advised for infant	12	25	22	35	49
Stillbirths	14	24	18	29	25
Death of mother, no doctor attending	—	—	1	1	1
Death of infant, no doctor attending	4	2	2	2	1
Laying out the dead	—	—	—	—	2

The increases in the number of notifications of sending for medical help is again probably partly attributable to more intelligent observation of the Rules due to a higher proportion of trained midwives. The supply of notification forms by the Council may have had some influence and also the issue of the revised Rules.

The notified still births correspond to 2.5 per cent. of the number of labours attended, as compared with 3 per cent. for 1910.

Special enquiries made included, among other subjects, cases of inflammation of the eyes, rise of temperature during the puerperium, puerperal sepsis or other exposure to infection, and deaths of mother or infant. Knowledge of these was obtained through the midwives' notifications, the returns of infectious disease and through other channels.

One death of a mother and two of infants were the subject of enquiry ; no blame attached to the midwives, and an inquest was thought necessary in the case of the mother only. Where possible inquests are attended by the Council's Officers.

In one of two cases of puerperal sepsis notified the conduct of the midwife called for special report, and her resignation was subsequently accepted by the Central Midwives Board in 1912. Of 14 notified cases of a rise of temperature during the puerperium, three proved to be suffering from puerperal sepsis and two were suspicious. As a rule such cases are removed through private channels to Addenbrooke's Hospital, Cambridge. They are not received into the Isolation Hospitals. With the exception of the case already mentioned no serious neglect of their rules was observed on the part of the midwives in attendance, but the dirty condition of the patients homes commonly called for comment.

Most of the 21 notified cases of inflammation of the eyes of the infant were enquired into. The revised Rule as to notification being somewhat more comprehensive in its terms probably accounts for the increased number of notifications (10 in 1910), as almost all cases were of slight severity. All were notified by trained nurses, and with the exception of occasional slight delay in obtaining medical advice, no fault could be found.

Arising out of a communication from the London County Medical Officer enquiries were made as to the use of silver preparations for instilling into the eyes at birth. It was found that only two midwives had such preparations in stock, boric acid being the antiseptic in common use, but some trained midwives make use of mercurial preparations.

Three training scholarships to the value of £25 were granted by the Education Committee during the year, two on application from the Bourn District Nursing Association and one from the Comberton Association. During the year also application was made by a local medical practitioner for recognition by the Central Midwives Board as a teacher of midwifery and by a local registered midwife for approval for the supervision of the practical work of pupils. Both applications were approved by the Board, and the training requisite for the examination preliminary to enrolment as a registered midwife can now be obtained at Cambridge.

Complaints were received from time to time, chiefly from registered midwives, regarding alleged practice by unregistered women. Enquiries were made and warnings issued when necessary. One case was the subject of special report to the Committee but owing to difficulty in proving habitual practice proceedings were not taken and the woman was formally

warned. In some of the districts in question, District Nurses have since been appointed, and it may reasonably be hoped that the skilled assistance thus rendered may lead to discontinuance of such irregular practice as may exist.

The Rules framed by the Central Midwives Board were revised during 1911, the amended Rules coming into operation on July 1st, for a period of five years. On the instructions of the Midwives Act Committee a circular was issued to midwives practising in the County explanatory of the alterations in Section E, which directly regulates their practice. Among the more important alterations were the following.

The requirements as to the cleanliness of the midwife and her appliances and house are more stringent.

Antiseptics are to be provided for the eyes of the infant, and the requirement as to obtaining medical help for the eyes is more strict.

The conditions under which disinfection is required have been extended so as to include all circumstances involving exposure of the midwife to infection of any kind or her own personal infection.

It is open to the Local Supervising Authority to forbid laying out the dead under circumstances specified, and they must be notified and also satisfied as to disinfection in any case.

The midwife is required to give every reasonable facility for inspection by the Supervising Authority's officers.

VITAL STATISTICS AND INCIDENCE OF INFECTIOUS DISEASE.

The official returns of the census of 1911 call for some notice as furnishing important information regarding the vital statistics of the County. Dealing first with the enumerated population, the geographical county of Cambridge stands fourth on the list of agricultural counties as regards rate of increase (Isle of Ely 8.2 per cent., Cambs 6.7 per cent). In the administrative counties generally the rate of increase compares favourably with that of the 1901 census in nearly all agricultural counties, being accelerated in 15 out of 23 such counties in England and Wales. In Cambridgeshire (Administrative County) instead of a decreasing population, (as inferred from a decline of 381 persons, or 0.3 per cent., between 1891 and 1901), there was an actual increase of 8,058 (or 6.7 per cent) during the 10 years ending April 1911. The rate of increase in the rural districts was 6.18 per cent.

The populations in the respective districts at the 1911 census (before alteration of Cambridge Borough boundary), and the rates of increase or decrease since 1901, are shewn in the following table:—

	Population.	Increase or Decrease.	Increase or Decrease per cent.
Cambridge Borough ...	40,027	+1,648	+ 4.3
Chesterton Urban	11,534	+1,943	+20.3
Caxton and Arrington Rural	7,775	— 46	— 0.6
Chesterton Rural	27,433	+3,779	+ 16.0
Linton ,, ...	10,567	— 162	— 1.5
Melbourn ,, ...	8,538	— 18	— 0.2
Newmarket ,, ...	19,864	+ 799	+ 4.2
Swavesey ,, ...	2,584	+ 116	+ 4.7
Administrative County ...	128,322	+8,058	+ 6.7

From enquiries made in 581 rural parishes the Registrar General attributes the rate of increase to mining and industrial development in 46 per cent., residential facilities in 43 per cent., the erection of institutions in 8 per cent. and to agricultural development in less than 1 per cent. In Cambridgeshire rural districts there is no mining and comparatively little manufacture; also no public institutions have been recently erected. The increase of residential facilities would certainly apply to Chesterton Rural District, but the increase of population is equally divided between the residential portion now included in the Borough of Cambridge, and the rural portion of the District. Apart from residential facilities in either area, any increase would appear to be attributable to agricultural development, but I am not in a position to say whether this hopeful inference is justified by facts.

In England and Wales 78 per cent. of the population are living under urban conditions and 22 per cent. under rural. In Cambridgeshire, after allowing for the urban portion of Chesterton Rural District transferred to the Borough, the population in Urban Districts is 55,812, or 43.4 per cent., and in Rural Districts is 72,510 or 56.6 per cent. of the County total.

The birth-rate and the death-rates from the various causes (except the rate of infantile mortality) are expressed per 1,000 persons living during the year, the estimate of the population being based on the increase or decrease between the last two census years. The populations for years between 1901 and 1911 were therefore calculated on the presumed continuance of the slight decrease which occurred between the census years 1891 and 1901, whereas the population of the County actually increased by 8,058. The vital statistics based on these estimates year by year were therefore in-

accurate, especially towards the close of the intercensal period. For example, the birth-rate and death-rate for 1910 were 20.8 and 12.1 per 1,000 respectively, instead of 22.0 and 12.9 as estimated. This has involved a recalculation of all the rates for the past five years for the purposes of the statistical tables appended to this report. The Registrar General points out that the best devised methods for checking local populations are not trustworthy in the later years of the decennium, and indicates the importance of a more frequent census for the purpose of vital statistics, the estimation of sanitary progress and the distribution of public funds on a population basis. The case for a five-yearly census has been frequently stated, and the Cambridgeshire experience certainly goes to support it.

The average number of persons per family as calculated from the census returns is :—England and Wales 4.4, Cambridgeshire 4.0, Cambridge Borough 4.1, Chesterton Urban 4.0. Rural Districts : Caxton and Arrington 4.1, Chesterton 3.9, Linton 3.9, Melbourn 3.8, Newmarket 4.1, Swavesey 3.7. In all Districts there is a diminution as compared with 1901, varying from 0.1 to 0.3 persons per family, but I have not given actual figures, as those for 1911, though more accurate, are not strictly comparable with those for 1901.

The relative proportions of the sexes are not without interest at the present moment. The number of females per 1,000 males is as follows :—England and Wales 1,068 (as in 1901), Cambridgeshire 1,081, Cambridge Borough 1222, Chesterton Urban 1,134, Chesterton Rural 1073, Caxton and Arrington Rural 936, Linton Rural 1011, Melbourn Rural 971, Newmarket Rural 958, and Swavesey Rural 1,006. The marked disproportion in Cambridge Borough is probably to a considerable extent due to the large number of University

lodging-houses, many of which are kept by spinsters or widows and require also the services of a domestic servant.

Cambridgeshire stands 36th on the list of the 62 administrative Counties as regards density of population, with 261 persons per square mile, or 2.4 per acre. The corresponding number for England and Wales is 618 per square mile.

The following are the principal items of the vital statistics for the year.

Area, 314,520 acres (exclusive of area covered by water).

Population, 128,537 (Census, 1901, 120,264; Census, 1911, 128,322. Increase in 10 years, 8,058or 6.7 per cent).

Births registered (net) 2,579, birth-rate 20.0 per 1,000 of population.

Infantile mortality, 252 deaths under one year, or 97 per 1,000 of *births* registered.

Deaths registered (net) 1,684, giving a death-rate of 13.1 per 1,000 of the population.

Notified cases of infectious disease, including pulmonary tuberculosis 940, or 7.3 per 1,000 of population. Excluding 79 notifications of pulmonary tuberculosis, 6.7 per 1,000.

Zymotic death-rate (principal infectious diseases). 170 deaths, giving a death rate of 1.32 per 1,000 of population.

Tuberculosis death-rate. Pulmonary tuberculosis caused 95 deaths, with a mortality rate of 0.73 per 1,000 of the population. Tuberculosis of other organs caused 48 deaths, giving a death rate of 0.37 per 1,000.

Cancer death rate. Cancer caused 141 deaths, yielding a mortality rate of 1.09 per 1,000 living.

Respiratory death rate. Deaths from respiratory diseases numbered 189, yielding a mortality rate of 1.47 per 1,000 of the population.

General Statement.—In common with the rest of the country the birth-rate in 1911 shewed a further decline, while there was a rise in the rate for deaths from all causes and an appreciable increase of mortality among infants. The year was a healthy one for adults and those at higher ages, but one of excessive mortality among childen, and especially during the first five years of life. This was largely accounted for by the prevalence of epidemic diarrhœa favoured by the prolonged drought which occurred during the third quarter of the year, and also by the widespread prevalence of measles. Scarlet fever on the other hand, though very prevalent in certain districts, was of a mild type and caused but few deaths. Deaths from pulmonary tuberculosis and cancer were appreciably fewer than in 1910.

Birth-rate.—The birth-rate for England and Wales in 1911 was 24.4 per 1,000 of the population, which is 0.7 below the rate in 1910, and the lowest rate on record, shewing also a decrease of 2.8 per 1,000 on the average of the ten years 1901—1910. The County birth-rate during 1911 was 20.0 per 1,000 living, a decrease of 0.8 on the rate for 1910 and of 1.4 on the average for the preceding five years. Reference to the declining rate is general throughout the District reports. For example, the average rate has fallen in the Linton Rural District from 30.7 for 1874-83 to 20.4 per 1,000 in 1901-10, while the Cambridge Borough rate has fallen from 29.3 in

1875 to 19 in 1911. The highest rate in 1911 was recorded in Newmarket Rural District, and the lowest in Caxton and Arrington Rural District. The rates for the individual Districts in the County were :—Cambridge Borough 20.2, Chesterton Urban 20.8, Chesterton Rural 20.2, Caxton and Arrington 18.7, Melbourn 19.5, Linton 19.9 Newmarket 22.2, and Swavesey Rural District 22.0.

There were 109 illegitimate births in the County, a rate of 0.89 per 1,000 of the population. The percentage of illegitimate to total births in the respective Districts was :—Cambridge Borough 4.8, Chesterton Urban 4.9, Chesterton Rural 5.5, Linton 7.1, Melbourn 5.4, Newmarket 3.6, Caxton and Arrington and Swavesey Rural Districts nil. The deaths of illegitimate children were in the proportion of 211 per 1,000 births as compared with the legitimate rate of 92 per 1,000. The contrast is somewhat significant.

Death-rate from all causes.—The death-rate for England and Wales was 14.6 per 1,000 living, or 1.1 per 1,000 above that for 1910 and identical with the rate for 1909. With these exceptions it was the lowest rate yet recorded, and shewed a decline of 0.8 per 1,000 on the average rate for the ten years 1901-10. In this County the net death-rate was 13.1 per 1,000, an increase of 1.0 on the 1910 rate and of 1.1 on the average rate for the preceding five years. The estimated rates for the respective Districts were :—Borough of Cambridge 13.6, Chesterton Urban 10.4, Chesterton Rural 11.2, Caxton and Arrington 16.7, Melbourn 14.0, Swavesey 17.0, Linton 14.6 and Newmarket Rural District 13.3 per 1,000. The lowest estimated rate was recorded for Chesterton Urban and the highest for Swavesey Rural District.

The total number of deaths exceeded the 1910 total by 131, the excess mortality being almost confined to the first fifteen years of life. The increase was most marked during the first year and diminished in the 1-5 and 5-15 age periods. During the first five years of life there was excessive mortality from epidemic diarrhœa and enteritis, especially during the first year, and from measles, more particularly from the age of 2-5 years. During the first year also there was an increased death-rate from " wasting diseases." From 5-15 there was an increase in the number of deaths attributed to tuberculosis, while the total deaths at all ages shewed a diminished mortality from pulmonary tuberculosis and cancer and also from pneumonia.

Rate of Infantile Mortality.—The number of deaths under one year in 1911 was 97 per 1,000 births registered, an increase of 30 per 1,000 births compared with the rate for 1910 and of 14 compared with the average for the preceding five years. The rate for England and Wales was 130 per 1,000 births, 24 above the 1910 rate, which was the lowest on record, and 3 above the average rate for 1901-10. For the various Districts the rates were :—Borough of Cambridge 125, Chesterton Urban 62, Chesterton Rural 77, Caxton and Arrington 111, Melbourn 102, Swavesey 78, Linton 114, and Newmarket Rural District 88 per 1,000 births. The highest rate occurred in Cambridge Borough and the lowest in Chesterton Urban District. In no District did the rate exceed that for England and Wales, and in all Districts they were below those for areas of a similar character in the country generally. The rates in the Rural Districts varied within wide limits, but all were below that for the rural and lesser urban districts in the country generally (118), and the rate for Cambridge Borough was 8 below that for the lesser towns (133).

It has already been pointed out that the high infantile mortality rate was partly attributable to "wasting diseases," partly to measles, but largely to epidemic diarrhœa and enteritis, no less than 54 deaths being assigned to these causes. A potent factor in the prevalence of these intestinal diseases was the exceptionally low rainfall during the third quarter of the year, not more than 3.13 inches of rain falling on an average in Cambs. and Hunts. during that period, or 6.94 inches below the average fall. The rainfall for the year also did not exceed 19.72 inches.

In Cambridge Borough the number of births notified under the Notification of Births Act was 638, identical with 1910, but the percentage notified was somewhat higher. There was an increase in the number notified by doctors and parents, and a decrease in notifications by midwives. The three Health Visitors of the League of Physical Education and Improvement continued their useful work in the Borough, paying 4159 visits to 856 infants notified under the Act. The low percentage of deaths among entirely breast-fed infants (3.6 per cent.) as compared with those not breast-fed (16.9), which was noted from 1906 onwards, was again demonstrated in 1910. The proportion of children entirely breast-fed was 79 per cent. The Infant Milk Depot, which is organised by a Voluntary Committee, also continued its operations, 67 infants attending during the year.

Epidemic Disease.—Disregarding 77 notifications of pulmonary tuberculosis there were 863 cases of infectious disease notified to the Local Sanitary Authorities during the year, as compared with 522 during 1910. This was a very notable increase, and is attributable to the prevalence of scarlet fever. There were also 155 cases of diphtheria notified, an increase of 37 on the figure for the preceding year. The

case-rate (excluding pulmonary tuberculosis) for all notifiable diseases was 7.3 per 1,000 of the population, against 4 per 1,000 for 1910. To the foregoing must be added the prevalence of measles, which is not a notifiable disease, but which caused 47 deaths in the County, and also a great increase in epidemic diarrhœa owing to the prolonged dry weather which prevailed during the third quarter of the year.

The zymotic death-rate comprises deaths from the principal epidemic diseases, whether notifiable or not, viz :—Small-pox, measles, whooping cough, scarlet fever, diphtheria, enteric or continued fever, and epidemic diarrhœa. There were 170 deaths from these diseases during 1911, equivalent to a mortality rate of 1.32 per 1,000 living, as compared with an average annual rate of 0.65 per 1,000 during the preceding five years. This very considerable excess was attributable to epidemic diarrhœa and measles, both diseases which are not notified to the Public Health Authorities. The zymotic death-rates for individual sanitary districts in 1911 were :— Borough of Cambridge 2.14 per 1,000, Chesterton Urban 1.29, Chesterton Rural 0.78, Caxton and Arrington Rural 0.9, Linton Rural 0.66, Melbourn Rural 0.58, Newmarket Rural 1.2, and Swavesey Rural nil.

Smallpox.—No case of smallpox occurred in the County. The vaccinated state of the County has received notice under Isolation Hospital Accommodation.

Scarlet Fever.—It is notable that although 594 cases were notified in the County there were only 3 deaths from this disease, yielding a mortality rate of 0.02 per 1,000 living, practically identical with the average rate for the preceding five years. The corresponding rate for England and Wales was 0.05 per 1,000. The chief prevalence of the disease in

this county was in Cambridge Borough and Chesterton Rural District, and also to a lesser degree in Newmarket Rural and Chesterton Urban District. In Newmarket Rural District epidemic conditions can only be said to have been present in two parishes, while Dr. Anningson associates the cases occurring in Chesterton Urban District with Castle End, in Cambridge Borough. In Chesterton Rural District, 23 sporadic cases occurred in 7 different parishes, and 124 of epidemic character in Harston, Cherryhinton, Willingham, Fulbourn, and Fen Ditton. Dr. Anningson attributes the continuance of the disease throughout the year at Harston to the very mild type, spread by very mild unrecognised cases, operating in varying degree through school assembly and social intercourse.

In Cambridge Borough 331 cases were notified from 228 households, the largest number in any year since the Infectious Diseases (Notification) Act came into force. About two-thirds of the cases occurred during the last four months of the year, and the outbreak has continued during 1912. A special report presented by the Medical Officer of Health deals with the outbreak during September and October, and contains matter of interest. Dr. Laird refers to past experience of scarlet fever in the Borough as bearing out the generally-recognised periodic tendency to waves of increased prevalence, and supports this by statistics for 20 years past. The present outbreak was first restricted to two well-defined areas which were widely separated, namely, Castle End and Romsey Town, and the first evidence of excessive prevalence appeared when the schools re-opened after the summer holidays. About this time cases were also detected in school at Old Cherryhinton, in the Chesterton Rural District, and were at first practically confined to children living in the Urban portion of the parish which immediately adjoins Romsey Town.

In the Borough 95 per cent. of the cases were among children aged from 5 to 15 years, the type being very mild. In practically the whole of these cases the source of infection was traced, and Dr. Laird attributes the spread to personal contact with cases unrecognised in the early stages and subsequently discovered to be desquamating. This is in correspondence with modern experience of scarlet fever, the mild type prevailing rendering this disease peculiarly difficult to control for this reason.

Dr. Laird considers that the relative importance of school influence as a factor in the spread of the disease was not very great. The apparent cessation of cases during school closure was really due to failure to notify, cases being notified on re-opening which had occurred during closure. "Much better results are to be obtained from prompt notification by Head Teachers of all absentees during an outbreak not satisfactorily accounted for." I am entirely convinced of the soundness of this observation, which is of importance in view of the tendency to regard school closure as a routine preventive measure. By instruction of the County Public Health Committee a circular letter was issued to School Managers drawing attention to this point. A considerable amount of work was done by the medical staff in the systematic inspection of schools in the County where cases of scarlet fever occurred.

Diphtheria.—This disease was somewhat more prevalent than in 1910, the notified cases numbering 155, a case-rate of 1.2 per 1,000, against 118 (case-rate 0.92) in 1910. There were 28 deaths, yielding a mortality rate of 0.21 per 1,000 compared with an average annual rate of 0.14 for the preceding five years. The fatality rate for England and Wales during 1911 was 0.13 per 1,000. Of the 155 notified cases 112

occurred in the Borough and 43 in the rest of the County. There were no cases in Melbourn and Swavesey Rural Districts, and there was a diminished prevalence, compared with 1910, in Chesterton, Linton and Newmarket Rural Districts. In Caxton and Arrington, of 4 cases, one was attributed to a previous case and another to contact with a convalescent child from Birmingham. In Chesterton Rural, two of 13 cases were imported from Cambridge Borough, while two of 5 cases in Chesterton Urban were attributed to outside infection. Of the 12 cases in Newmarket, 6 occurred at Isleham and 3 in one family at Soham ; the disease was very fatal in this District. Of 8 cases in Linton Rural, 5 occurred in one family at Linton.

The case-rate was high in Cambridge Borough, viz. 2.79 per 1,000 (112 cases), but if 25 notified " carriers " be deducted there were 87 actual clinical cases (case-rate 2.17 per 1,000). The fatality, 16.9 per cent. of notified cases, was 1.1 below the average for the preceding 10 years ; the large number of " carrier " cases notified may have influenced this reduced rate. The clinical diagnosis was confirmed bacteriologically in 83 out of the 112 cases, and a large number of throat swabs (808) was taken from home contacts and children at school. More than half the cases occurred among school children. " There was no unusual method of spread to account for the great increase in the number of cases. In every instance personal infection, either from a recognised clinical case or from a germ " carrier," seems to have been the source. The grouping of cases in schools arose mainly from the presence of carriers among the children." Dr. Laird deprecates a tendency to delay the use of antitoxin until bacteriological confirmation of the diagnosis is obtained, as valuable time is lost in this way, and the hope is expressed that full use will be made of the free supply of antitoxin provided by the Borough Authority.

Enteric Fever.—Twenty cases were notified, half of which were in Chesterton Rural District. The case-rate, 0.16 per 1,000, is satisfactory compared with that for England and Wales, 0.38 per 1,000. Four deaths occurred, a fatality rate of 0.03 per 1,000 living, identical with the annual mean rate for the preceding 5 years. The corresponding rate for England and Wales was 0.07 per 1,000 living.

Of the 10 cases notified in Chesterton Rural District, 6 were in Waterbeach, but there is no special note with regard to these cases. One of two at Fen Ditton came home ill from Cambridge, and defective drainage was noted with reference to the other. Of the two Melbourn Rural cases, one was ill on arrival (? from Linton Rural District) and the other was supposed to be imported from outside the County. The three cases in Newmarket Rural District occurred in separate parishes. The three cases in Cambridge Borough were all imported, and Chesterton Urban and Swavesey and Linton Rural Districts were free from the disease. Both the cases in Caxton and Arrington Rural District occurred in one house. In the first case, the onset of the disease exactly coincided with the incubation period after eating mussels ; other persons who ate the mussels suffered from temporary diarrhœa and sickness. The second sufferer was the son of the first, who ate food left by his mother, using the same spoon.

Erysipelas.—There were 80 notified cases, 26 from Cambridge Borough, 12, 13 and 14 from Chesterton, Caxton and Arrington and Linton Rural Districts respectively. Swavesey Rural was free, and there were smaller numbers in the remaining Districts. The case-rate was 0.62 per 1,000 living (England and Wales 0.69). Only two deaths resulted.

Attention having been drawn to the high proportion of notifications of erysipelas in Caxton and Arrington Rural District the matter was gone into by the Medical Officer of Health and myself. We found that the proportion of notifications from erysipelas to total notifications of infectious disease from 1905 to 1911 was three times as high as in the rest of the County. About half the cases in the District were notified by one practitioner out of 6 in practice, and the great majority of these notifications were from one parish.

Puerperal Fever.—Four deaths were attributed to this cause, two in Cambridge Borough and one each in Chesterton and Linton Rural Districts, a mortality rate of 0.03 per 1,000 living for the County. The number of notifications of puerperal fever received was 13 (Cambridge Borough 5, Chesterton Rural 5, Newmarket Rural 2 and Linton Rural 1), a case-rate of 0.1 per 1,000, the highest rate recorded for the Administrative Counties of England and Wales during 1911. It should be noted, however, that in this county cases of high temperature occurring during the puerperal period are notified and may be classed as puerperal fever, though all such do not eventually prove to be due to sepsis. Reporting to the Local Government Board, Dr. Newsholme observes that "There is reason to believe that the extent to which septic infection occurring after parturition is notified varies considerably in different areas." In a table of sepsis mortality rates given elsewhere for the period 1897—1908, Cambs. stands 43rd out of the 45 Registration Counties, with a rate of 1.36 per 1,000 births, only two other Counties having lower rates.

As regards the association of registered midwives with puerperal sepsis it has been shewn elsewhere in this report that of 14 cases attended by a rise of temperature during the

puerperium which were notified by midwives, three proved to be due to septicæmia and two were suspicious, while in addition two other cases were notified as puerperal fever. Cases of puerperal sepsis are received at Addenbrooke's County Hospital; there is no accommodation in the Isolation Hospitals.

Only six deaths were attributed to accidents of parturition other than sepsis. There can be no doubt that much useful maternity work is done by the District Nursing Associations, the value of which would be augmented if trained nursing skill were available in those Rural areas where no such provision has yet been made.

Influenza.—There were 15 deaths registered from this disease, a death-rate of 0.11 per 1,000 living, as compared with 28 deaths and a rate of 0.23 during 1910, a reduced prevalence of nearly 50 per cent.

Epidemic Diarrhœa.—Epidemic diarrhœa, including enteritis, is not notifiable under the Infectious Disease Notification Acts. Inference as to its prevalence is drawn from the death returns. During 1910 the very small number of five deaths occurred from this cause, but during 1911 the deaths numbered as many as 80, yielding a death-rate of 0.62 per 1,000 living. To render the returns strictly comparable with those of the Registrar-General, deaths from diarrhœa among persons above two years of age should be omitted. The selected figure for comparison is therefore 66 deaths for the County, yielding a mortality rate of 0.51 per 1,000 living. Although a very high rate for this County, it compares very

favourably with that for England and Wales, viz. 1.06, and this comparison holds good still further. Of the 66 deaths under two years, 31 occurred in Cambridge Borough, yielding a death-rate of 0.77 against 1.14 for the 136 smaller towns, while the 35 deaths in the rest of the County yielded a death-rate of 0.39 against 0.77 for England and Wales less the 213 towns. While this comparison with the country generally is satisfactory, the figures represent a serious loss of infant life, and the explanation lies in the very deficient rainfall during July, August and September, a phenomenon which was shared by this County with the rest of the country. The fall in Cambs. and Hunts. during the third quarter of the year equalled only about one-third of the average fall, and this is the period during which the great majority of deaths from epidemic diarrhœa occur. Dr. Laird remarks of Cambridge Borough :—"On only four occasions during the last twenty years has the annual number of deaths from diarrhœa diseases exceeded that of 1911. This excessive mortality occurred chiefly in the autumn, and it is to be attributed to the exceptionally high temperatures and low rainfall which were then experienced."

The part played by flies in the spread of epidemic diarrhœa has been dealt with in previous reports. Dr. Newsholme points out that while their number in the summer months may be regarded in towns as a valuable index of the possibilities of contamination of food, especially from privy and pail contents and from accumulations of house or stable refuse, yet there is a danger of assuming that the prevention of diarrhœa is limited to the destruction of flies. "It is concerned also with the personal cleanliness of the mother who has to prepare the infant's food, and with the cleanliness of the house, the backyard, the court, and the street, from which

infective material may obtain access to the infant's food, with or without the intermediation of flies" Clearly much may be done by supervision of infant management by Health Visitors, by the removal of insanitary types of closet as opportunity arises, and by a frequent and thorough system of removal of household and other refuse. While the problem is more serious in urban than in rural areas, a great deal remains to be done in the villages, in the larger of which at least systematic scavenging should be carried out. In smaller villages, with more garden ground, most of the inhabitants have yet to learn how to dispose of their refuse safely, easily and without offence.

Measles.—Like epidemic diarrhœa and whooping cough, this disease is not notifiable to the Local Sanitary Authority. It was seriously prevalent during the year, both in the Borough and the rest of the County, causing 47 deaths in all, 31 of which occurred in the Borough and 16 in the rest of the County. The highest number of deaths (16) occurred during the second year of life, and only one death occurred after the age of 14 years. The death-rate was 0.36 per 1,000 living, identical with that for England and Wales, and nearly three times as great as the average annual rate for the preceding five years (0.13). It is worthy of note that the deaths from measles and whooping cough from 1906-11 amounted to 270, compared with 133 from scarlet fever and diphtheria.

The evidence available appears to shew that there is no real decrease in the incidence of this disease in the country. It is not under administrative control by Sanitary Authorities and there are considerable difficulties in the way. In this County, as elsewhere, school notification, though of some value, is often too late for effectual steps to be taken. This

arises from the infectious nature of the disease in the early unrecognised stages, and partly from concealment on the part of the parents, and failure to call in a doctor. At a conference of London Medical Officers with the Local Government Board the suggestion was made that the first cases occurring in a house should be notified (to curtail expense) and that hospital isolation should be provided where home nursing is unsatisfactory. This, of course, would necessitate increased hospital accommodation, and systematic home visitation would also be required.

Whooping Cough.—There were 8 deaths from this disease during 1911, yielding the low mortality rate of 0.06 compared with 0.21, the annual average rate for the preceding five years. No death occurred within Cambridge Borough; the chief incidence was in Newmarket Rural District. The observations as to lack of administrative control of measles apply equally to this disease.

Pulmonary Tuberculosis.—Reference has been made in an earlier section to the notification of this disease. Up to January 1st, 1912, notification was only compulsory for Poor Law and hospital cases. The total number of cases notified during 1911 was 77, of which 18 were Poor Law cases, and 42 hospital cases, while 17 were notified in addition under a voluntary system in Cambridge Borough. It is not possible from these figues to form any accurate estimate of the existing number of cases in the County, but a rough estimate can be arrived at from the death returns. The deaths registered numbered 95, against 118 in 1910, equivalent to a mortality rate of 0.73 per 1,000 living, a decline of 0.23 per 1,000 on the mean annual rate for the preceding 10 years, and of 0.20 on the corresponding rate for the preceding 5 years. The rates for the respective Districts are shown in the following table.

	Annual average Deaths 1901-10	Deaths in 1911	Death-rate per 1,000 in 1911
Cambridge Borough	42.2	30	0.75
Chesterton Urban	8.3	8	0.7
Chesterton Rural	20.5	16	0.58
Caxton and Arrington Rural ...	8.7	3	0.38
Linton Rural	9.4	9	0.8
Melbourn Rural	7.3	14	1.6
Newmarket Rural	20.4	12	0.6
Swavesey Rural	4.1	3	1.16

The number of deaths in the County varies from year to year, but the general tendency is to a declining mortality. Where, on an average, 100 persons out of 100,000 died from pulmonary tuberculosis in each year from 1901 to 1905, 93 died annually on an average from 1906 to 1910, and only 73 in 1911. The marked drop last year may not be maintained, and may be due to some extent to the milder weather favouring a reduced mortality. The exact figures for the County from 1901 are given in the following table.

	Deaths.	Rate per 1,000.
1901 ...	139 ...	1.15
1902 ...	124 ...	1.02
1903 ...	117 ...	0.96
1904 ...	106 ...	0.86
1905 ...	128 ...	1.03
1906 ...	126 ...	1.01
1907 ...	118 ...	0.94
1908 ...	122 ...	0.96
1909 ...	107 ...	0.84
1910 ...	118 ...	0.92
Average for 10 years 1901—1910	**120**	**0.96**
1911	**95**	**0.73**

Although it is satisfactory to note this gradual decline in the prevalence of pulmonary tuberculosis, it is desirable that the serious loss of life which it causes annually should be fully appreciated. From the average of 112 deaths per annum during the past five years the rough estimate of from 300 to 400 existing cases in all stages of the disease may be formed. The following figures for twelve years past (1900-11) are instructive.

	Total deaths.	Annual Average.
All forms of Tuberculosis	1954	163
Pulmonary Tuberculosis	1438	119
Principal Zymotic Diseases ...	1200	100

Deaths from pulmonary tuberculosis alone, therefore, exceeded those from all the principal epidemic diseases put together. They were four times as numerous as the combined total from scarlet fever, diphtheria and enteric fever. More than this, pulmonary tuberculosis alone accounted for 1 in every 13 deaths from all causes, while 1 in every 10 were from some form of tubercular disease. Two out of every three phthisis deaths occurred between the ages of 25 and 65, the most valuable working period of life.

Tuberculosis of other Organs.—During 1911, 48 deaths were recorded, a rate of 0.37 per 1,000 living, as against a rate of 0.25 during 1910. There was therefore some increase. The rates for the Districts were :—Cambridge Borough 0.32, Chesterton Urban 0.17, Chesterton Rural 1.45, Caxton and, Arrington 0.12, Linton 0.2, Melbourn 0.34, Newmarket 0.5, and Swavesey Rural nil.

Cancer.—Deaths from this cause numbered 141 as against 161 in 1910. The mortality rate, 1.09 per 1,000 living, showed a decrease of 0.12 on the average annual rate of 1.21

for the preceding five years, and was the lowest rate since 1904, when it was identical. The gradual progressive increase in deaths from cancer was therefore checked during the year. The rates from 1901 onwards are given in the following table.

	Deaths.	Rate per 1,000
1901 ...	123 ...	1.02
1902 ...	100 ...	0.82
1903 ...	121 ...	0.99
1904 ...	131 ...	1.06
1905 ...	135 ...	1.09
1906 ...	147 ...	1.18
1907 ...	154 ...	1.23
1908 ...	152 ...	1.20
1909 ...	154 ...	1.21
1910 ...	161 ...	1.26
Average for 10 years 1901—1910	**137**	**1.10**
1911	**141**	**1.09**

The relative mortality in individual districts during 1911 is shown by the following figures :—Cambridge Borough 0.94, Chesterton Urban 1.36, Chesterton Rural 0.58, Caxton and Arrington 0.76, Melbourn 1.2, Swavesey 2.7, Newmarket 1.45, and Linton Rural 1.6, all in rates per 1,000 living.

Respiratory Death-Rate.—The number of deaths during 1911 from non-tubercular diseases of the respiratory organs was 189, a reduction of 18 on 1910. The mortality rate from these diseases was 1.47 per 1.000 living against an average

annual rate of 1.7 for the preceding 5 years. The reduction on 1910 was under the headings of pneumonia and broncho-pneumonia, and mainly from the age of 25 years upwards, the mild early winter probably having had some influence. In rural areas agricultural labourers especially suffer from respiratory diseases, owing to their exposure to the weather. The influence of impure air and dusts generated during certain occupations is doubtless more marked in towns. In the urban districts of the County the death-rate from these diseases was 1.51 per 1,000 living, against 1.44 in the rural districts.

Acute Poliomyelitis.—Two deaths were registered from this disease, one in the 5-15 year age period and one at the age of 16. The latter victim was possibly infected at Oxford, but resided within a few miles of a village in West Suffolk where the disease was epidemic, so that infection from the latter source seems more probable.

The disease cannot be said to have been epidemic in this County. Altogether, some 20 cases came to my notice through Addenbrooke's County Hospital, through School Teachers and Attendance Officers and from other sources. Of these, 8 were males and 12 females. The approximate ages were :— 1 of 1 year, 3 of 2 years, 3 of 4 years, 3 of 5 years, 4 of 6 years, and one each of 8, 11, 12, 14 and 16 years. The main incidence was, therefore, between the ages of 2 and 6 years. Accurate dates of onset were not always obtainable, but about 11 commenced at the end of July or during August (chiefly the latter), 6 in September or early October and the remaining 5 at earlier or later dates. The cases therefore arose mainly during the hottest and dryest months of the year and died out in the colder weather. The great majority enquired into belonged to the labouring classes. In no case was more than

one person reported from the same household. The 20 known cases occurred in 13 parishes as widely separated as Wicken in the North, Shepreth in the South, and Kirtling in the East, but some tendency to grouping of parishes was noticeable. Four of the cases occurred in Cambridge Borough, 3 at Barton and 3 at Histon, the remaining 11 occurring in separate parishes.

FRANK ROBINSON,

County Medical Officer of Health.

County Public Health Department,

Cambridge.

September, 1912.

TABLE I.

VITAL STATISTICS OF WHOLE DISTRICT DURING 1911 AND PREVIOUS YEARS.

Year.	Population estimated to middle of each year.	Births.			Total Deaths Registered in the District.		Transferable Deaths‡		Nett Deaths belonging to the District.			
		Uncorrected Number.	Nett.						Under 1 Year of Age.		At all Ages.	
			Number.	Rate.	* Number.	Rate.	Of Non-residents registered in the District.	Of Residents not registered in the District.	* Number.	Rate per 1000 Nett Births.	* Number.	Rate.
1	2	3	4	5	6	7	8	9	10	11	12	13
1906	124293	2751	2755	22·1	1741	14·0	140	128	275	99	1729	13·9
1907	125130	2688	2688	21·4	1649	13·1	159	144	204	75	1634	13·0
1908	125973	2645	2647	21·0	1758	13·1	151	137	273	103	1744	13·8
1909	126822	2775	2776	21·8	1706	13·4	170	151	201	72	1687	13·3
1910	127677	2661	2667	20·8	1558	12·2	141	128	173	67	1545	12·1
Averages for years 1906-1910.	125979	2704	2706	21·4	1682	13·3	152	137	225	83	1667	13·2
1911	128537	2568	2579	20·0	1692	13·1	171	163	252	97	1684	13·1

NOTES.—This Table is arranged to show the gross births and deaths in the district, and the births and deaths properly belonging to it with the corresponding rates. For years before 1911 some of the corrected rates probably will not be available. The rates should be calculated per 1,000 of the estimated gross population.

* In Column 6 are to be included the whole of the deaths registered during the year as having actually occurred within the district.

In Column 12 is to be entered the number in Column 6, corrected by subtraction of the number in Column 8, and by addition of the number in Column 9. Deaths in Column 10 are to be similarly corrected by subtraction of the deaths under 1, included in the number given in Column 8, and by addition of the deaths under 1 included in the number given in Column 9.

‡ "Transferable Deaths" are deaths of persons who, having a fixed or usual residence in England or Wales, die in a district other than that in which they resided. The deaths of persons without fixed or usual residence, *e.g.*, casuals, must not be included in Columns 8 or 9, except in certain instances specified elsewhere. The Medical Officer of Health will state in Column 8 the number of transferable deaths of "non-residents" which are to be deducted, and will state in Column 9 the number of deaths of "residents" registered outside the district which are to be added in calculating the nett death-rate of his district.

Area of District in acres (exclusive of area covered by water) ...	314,520	
Total population at all ages	128,322	At Census of 1911.
Number of inhabited houses		
Average number of persons per house		

TABLE II.

Cases of Infectious Disease notified during the Year 1911 in the Administrative County of Cambridge and its Districts.

NOTIFIABLE DISEASE.	CASES NOTIFIED IN WHOLE COUNTY.								TOTAL CASES NOTIFIED IN EACH DISTRICT.								NO. OF CASES REMOVED TO HOSPITAL FROM EACH DISTRICT.							
	At all Ages.	At Ages—Years.							Borough of Cambridge.	Chesterton Urban District.	Chesterton Rural District.	Caxton and Arrington Rural District.	Linton Rural District.	Melbourn Rural District.	Newmarket Rural District.	Swavesey Rural District.	Borough of Cambridge.	Chesterton Urban District.	Chesterton Rural District.	Caxton and Arrington Rural District.	Linton Rural District.	Melbourn Rural District.	Newmarket Rural District.	Swavesey Rural District.
		Under 1	1 to 5.	5 to 15.	15 to 25.	25 to 45.	45 to 65.	65 and upwards.																
Small-pox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—					
Cholera	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—					
Diphtheria ... including Membranous croup	155	—	28	104	16	7	—	—	112	5	13	5	8	—	12	—	105	3	‡1				8	
Erysipelas	80	2	2	3	11	26	27	9	26	5	12	13	14	3	7	—	—		—					
Scarlet fever	594	2	81	354	129	26	2	—	331	33	147	2	10	21	44	6	299		92			12	38	
Typhus fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—					
Enteric fever ...	20	—	—	3	4	4	6	3	3		10	2	—	2	3	—	—		‡6				2	
Relapsing fever ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—					
Continued fever ...	1	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—		—					
Puerperal fever ...	13	—	—	—	4	6	3	—	5	—	5	—	1	—	2	—	—		—					
Plague	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—					
Phthisis — Under Tuberculosis Regulations, 1908	18	—	1	1	7	7	1	1	9	—	4	2	2	1	—	—	—		—					
Phthisis — Under Tuberculosis Regulations, 1911	42	—	—	2	13	21	6	—	*19	4	10	—	2	3	4	—	16		—					
Phthisis — Others	17	—	—	1	3	9	3	1	17	—	—	—	—	—	—	—	—		—					
Totals	940	4	112	468	188	106	48	14	522	47	202	24	37	30	72	6	†420	10	99			12	48	

* In addition to this number, twenty-six cases of Phthisis were notified from Addenbrooke's Hospital among patients who attended that Institution, but lived outside the Borough.

† Does not include cases admitted from other Authorities. Besides those cases removed into the Borough Infectious Diseases Hospital, two cases of Scarlet Fever, one case of Typhoid Fever, three cases of Puerperal Fever, and six cases of Erysipelas belonging to the Borough, were medically treated in Addenbrooke's Hospital.

‡ Removed to Addenbrooke's Hospital, Cambridge.

Isolation Hospitals:—Cambridge Borough Infectious Diseases Hospital; Small-pox Station, situated in the Parish of Cherryhinton, and Isolation Hospital at Oakington, both in the Chesterton Rural District; Isolation Hospital of the Royston, Ashwell and Melbourn Joint Board, at Garden Walk, in the Parish of Royston; Newmarket Fever Hospital (a Joint Isolation Hospital [permanent] situated in the Newmarket Urban District); Isolation Hospital for Small-pox for the Parish of Bourn, in the Caxton and Arrington Rural District (not yet used). For other Information see page 66.

TABLE III.

Causes of, and Ages at, Death during Year 1911 in the Administrative County of Cambridge and its Districts.

Causes of Death.	Nett Deaths at the subjoined ages of "Residents" whether occurring within or without the District.									Nett Deaths in or belonging to Districts (at all Ages).								Total Deaths in Public Institutions in the County.
	All 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.	Borough of Cambridge.	Chesterton Urban.	Chesterton Rural.	Caxton and Arrington Rural.	Linton Rural.	Melbourn Rural.	Newmarket Rural.	Swavesey Rural.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
All Causes — Certified	1663	247	67	47	70	66	153	312	701	550	118	305	120	151	121	255	43	299
All Causes — Uncertified	21	5	3	1	—	—	—	2	10	1	2	4	—	3	—	10	1	—
Enteric Fever	4	—	—	—	1	1	1	1	—	—	—	2	—	—	1	1	—	1
Small-pox	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Measles	47	12	16	13	5	—	1	—	—	31	6	6	1	1	—	2	—	1
Scarlet fever	3	—	—	1	2	—	—	—	—	1	—	1	—	—	—	1	—	3
Whooping-cough	8	2	3	2	1	—	—	—	—	—	—	—	—	2	1	5	—	—
Diphtheria and Croup	28	—	4	7	16	1	—	—	—	19	2	2	—	—	—	5	—	17
Influenza	15	—	—	—	1	—	2	4	8	1	1	2	3	3	3	2	—	1
Erysipelas	2	—	—	—	—	—	—	1	1	—	—	—	—	2	—	—	—	—
Cerebro-Spinal Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Poliomyelitis	2	—	—	—	1	1	—	—	—	—	—	1	—	—	—	1	—	—
Phthisis (Pulmonary Tuberculosis)	95	—	1	—	4	18	49	18	5	30	8	16	3	9	14	12	3	16
Tuberculous Meningitis	17	2	4	4	5	—	2	—	—	5	1	5	1	2	—	3	—	4
Other tubercular diseases	31	3	2	1	7	6	5	7	—	8	1	11	—	1	3	7	—	7
Rheumatic Fever	4	—	—	—	3	—	—	—	1	1	—	—	—	—	—	3	—	—
Cancer, malignant disease	141	—	—	—	—	1	8	66	66	38	16	17	6	17	11	29	7	26
Bronchitis	81	13	3	1	—	3	1	10	50	23	3	15	8	7	5	18	2	4
Broncho-Pneumonia	30	13	6	1	1	—	1	1	7	16	2	8	—	1	1	2	—	1
Pneumonia (all other forms)	52	6	5	2	1	1	9	7	21	19	2	8	2	9	4	6	2	16
Other diseases of Respiratory organs	26	—	1	3	—	2	1	5	14	11	2	4	—	4	—	5	—	2
Diarrhœa and Enteritis	80	54	12	5	2	—	—	3	4	35	7	11	6	4	4	11	2	1
Appendicitis and Typhlitis	3	—	—	—	1	—	1	1	—	2	—	—	—	—	—	1	—	2
Alcoholism	2	—	—	—	—	1	—	1	—	—	—	1	—	—	1	—	—	—
Cirrhosis of Liver	18	—	—	1	—	—	3	7	7	4	1	5	4	—	—	3	1	1
Nephritis and Bright's Disease	41	—	—	—	1	3	5	15	17	16	4	6	1	4	1	8	1	7
Puerperal Fever	4	—	—	—	—	2	2	—	—	2	—	1	—	1	—	—	—	—
Other accidents and Diseases of Pregnancy and Parturition	6	2	—	—	—	—	4	—	—	3	—	—	—	—	—	3	—	2
Congenital Debility and Malformation, including Premature Birth	98	98	—	—	—	—	—	—	—	33	3	14	5	15	11	15	2	8
Violent Deaths, excluding Suicide	45	3	1	2	4	5	5	13	12	20	2	7	2	4	3	7	—	15
Suicides	19	—	—	—	—	1	9	5	4	7	2	2	1	2	2	3	—	2
Not certified	7	—	—	—	—	—	—	—	7	—	2	4	—	—	—	—	1	—
Other Defined Diseases	763	41	12	5	14	20	44	143	484	222	55	160	76	63	56	108	23	161
Diseases ill-defined or unknown	12	3	—	—	—	—	—	6	3	4	—	—	1	3	—	4	—	1
	1684	252	70	48	70	66	153	314	711	†551	120	309	120	154	121	265	44	299

† See footnote on Table V.

TABLE IV.

Infantile Mortality in the Administrative County of Cambridge during the year 1911. Nett Deaths from stated Causes in Weeks and Months under One Year of Age.

CAUSE OF DEATH.	Under 1 Week.	1—2 Weeks.	2—3 Weeks.	3—4 Weeks.	Total under 1 Month.	1—3 Months.	3—6 Months.	6—9 Months.	9—12 Months.	Total Deaths under one Year
All Causes. Certified ...	55	11	11	8	85	44	49	37	32	247
All Causes. Uncertified	—	2	—	—	2	1	1	—	1	5
Small-pox	—	—	—	—	—	—	—	—	—	—
Chicken-pox	—	—	—	—	—	—	—	—	—	—
Measles	—	—	—	—	—	—	1	1	10	12
Scarlet Fever	—	—	—	—	—	—	—	—	—	—
Diphtheria and Croup...	—	—	—	—	—	—	—	—	—	—
Whooping Cough ...	—	—	—	—	—	—	—	1	1	2
Diarrhœa	—	1	2	1	4	3	8	8	4	27
Enteritis	—	1	—	—	—	3	13	7	3	27
Tuberculous Meningitis...	—	—	—	—	—	1	—	—	1	2
Abdominal Tuberculosis	—	—	—	—	—	—	—	1	1	2
Other Tuberculous Diseases	—	—	—	—	—	—	1	—	—	1
Congenital Malformations	8	3	—	2	13	2	1	1	1	18
Premature Birth ...	23	3	3	—	29	8	1	—	—	38
Atrophy, Debility, and Marasmus	10	1	5	3	19	16	5	3	—	43
Atelectasis	1	—	—	—	1	—	—	—	—	1
Injury at Birth	1	—	1	—	2	—	—	—	—	2
Erysipelas	—	—	—	—	—	—	—	—	—	—
Syphilis	—	—	—	—	—	—	—	—	—	—
Rickets	—	—	—	—	—	—	—	—	—	—
Meningitis (*not Tuberculous*)	—	—	—	—	—	2	2	3	—	7
Convulsions	3	—	—	1	4	2	2	—	1	9
Gastritis	—	—	—	—	—	—	—	—	1	1
Laryngitis	—	—	—	—	—	—	—	—	—	—
Bronchitis	—	—	—	1	1	3	2	3	5	14
Pneumonia (all forms) ...	—	—	—	—	—	2	8	5	2	17
Suffocation, overlying ...	—	—	—	—	—	1	1	—	1	3
Other Causes	9	4	—	—	13	2	5	4	2	26
	55	13	11	8	87	45	50	37	33	252

Nett Births in the year { legitimate 2,464 ; illegitimate 115 }

Nett Deaths in the year of { legitimate infants 212 ; illegitimate infants 60 }

TABLE V.

Vital Statistics of the separate Districts of the Administrative County of Cambridge in 1911 and previous five years.

Names of Districts.	1. Borough of Cambridge.				2. Chesterton Urban District.				3. Chesterton Rural District.				4. Caxton and Arrington Rural District.			
Year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.
	a.	b.	c.	d.	a.	b.	c.	d.	a.	b.	c.	d.	a.	b.	c.	d.
1906 ...	39183	791	525	101	10566	295	129	18	25566	555	328	46	7821	178	123	21
1907 ...	39367	816	510	72	10763	230	125	12	25950	513	323	38	7821	172	102	7
1908 ...	39542	791	594	107	10963	242	112	13	26337	513	338	43	7821	180	110	16
1909 ...	39718	854	543	71	11167	270	103	16	26730	570	334	44	7821	166	108	10
1910 ...	39894	799	507	61	11375	247	94	8	27129	557	284	36	7821	151	83	6
Averages for Years 1906 to 1910	39540	810	536	82	10966	256	108	13	26342	541	321	41	7821	169	105	12
1911 ...	40069	764	551*	96	11587	242	120	15	27534	557	309	43	7775	146	120	14

Names of Districts.	5. Linton Rural District.				6. Melbourn Rural District.				7. Newmarket Rural District.				8. Swavesey Rural District.			
Year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all Ages.	Nett Deaths under 1 year.	Population estimated to middle of each year.	Births registered.	Nett Deaths at all ages.	Nett Deaths under 1 year.
	a.	b.	c.	d.	a.	b.	c.	d.	a.	b.	c.	d.	a.	b.	c.	d.
1906 ...	10648	203	163	17	8556	163	129	15	19469	514	283	52	2468	56	49	5
1907 ...	10631	216	138	17	8556	207	106	10	19560	483	292	46	2468	51	38	2
1908 ...	10615	208	153	26	8556	176	129	18	19641	487	272	46	2468	50	36	2
1909 ...	10599	201	134	8	8556	188	139	14	19767	477	279	33	2468	50	47	5
1910 ...	10583	207	136	7	8556	161	131	18	19802	499	255	32	2468	46	55	5
Averages for Years 1906 to 1910	10615	207	144	15	8556	179	126	15	19647	492	276	42	2468	50	45	4
1911 ...	10563	211	154	24	8538	166	121	17	19884	442	265	39	2584	51	44	4

* By order of the Registrar-General this number includes the deaths of 3 undergraduates who did not belong to the district.

TABLE VI.

Administrative County and its Districts. Deaths from the seven principal epidemic diseases during the year 1911 and the antecedent five years, with the mean death-rates calculated per 1,000 of the estimated population.

Year.	Administrative County.							Borough of Cambridge.							Chesterton Urban District.						
	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.
1906	...	21	5	21	39	6	62	...	1	1	12	16	1	42	...	...	2	2	3	...	2
1907	...	9	2	11	15	4	16	...	...	1	3	...	...	12	...	3	1	2	...	2	...
1908	...	43	2	19	57	4	19	...	33	...	6	32	...	9	...	2	...	3	3	...	1
1909	...	12	4	18	10	5	15	...	1	1	7	...	...	15	...	...	...	...	...	...	...
1910	...	3	...	20	14	2	5	...	...	...	14	8	...	4	...	...	...	...	...	...	...
Averages for years 1906 to 1910	...	17·6	2·6	17·8	27·0	4·2	23·4	...	7·0	0·6	8·4	11·2	0·02	16·4	...	1·0	0·6	1·4	1·2	0·4	0·6
Mean death-rate	...	0·13	0·02	0·14	0·21	0·03	0·18	...	0·17	0·01	0·21	0·27	0·05	0·41	...	0·09	0·05	0·12	0·10	0·03	0·05
1911	...	17	3	28	8	4	80	...	31	1	19	...	...	35	...	6	...	2	...	...	7

Year.	Chesterton Rural District.							Caxton and Arrington Rural District.							Linton Rural District.						
	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.
1906	...	2	...	3	10	...	8	...	1	1	...	4	...	1	...	11	...	1	3	2	4
1907	...	...	...	4	4	1	3	...	...	...	...	...	...	...	...	1	...	2	3	...	...
1908	...	1	...	6	4	3	2	...	...	...	...	2	...	...	...	1	1	...	8	...	2
1909	...	4	...	7	2	3	...	...	...	...	...	1	1	...	...	...	1	1	1	...	...
1910	...	1	...	1	4	...	...	...	...	...	1	...	1	...	...	...	...	1	...	1	1
Averages for years 1906 to 1910	...	1·6	...	4·2	4·8	1·4	2·6	...	0·2	0·2	0·2	1·6	0·4	0·2	...	2·6	0·4	1·0	3·0	0·6	1·4
Mean death-rate	...	0·05	...	0·15	0·22	0·05	0·09	...	0·02	0·02	0·02	0·40	0·01	0·02	...	0·24	0·03	0·09	0·28	0·05	0·13
1911	...	6	1	2	...	2	11	...	1	...	...	...	...	6	...	1	...	...	2	...	4

Year.	Melbourn Rural District.							Newmarket Rural District.							Swavesey Rural District.						
	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Enteric Fever.	Diarrhœa.
1906	...	...	...	...	1	1	1	...	6	2	3	2	2	3	...	...	...	...	...	...	1
1907	...	...	...	...	4	1	1	...	5	...	...	4	...	...	...	...	...	...	...	...	...
1908	...	...	...	...	2	1	1	...	5	1	4	6	...	3	...	1	...	...	...	...	2
1909	...	2	2	...	2	1	...	...	...	...	3	4	...	...	...	5	...	...	...	...	...
1910	...	...	...	...	...	...	...	...	2	...	3	2	...	...	...	...	...	...	...	...	...
Averages for years 1906 to 1910	...	0·4	0·4	...	1·8	0·8	0·6	...	3·6	0·6	2·6	3·6	0·4	1·2	...	1·2	...	...	...	...	0·6
Mean death-rate	...	0·04	0·04	...	0·22	0·09	0·07	...	0·18	0·03	0·13	0·18	0·02	0·06	...	0·48	...	...	...	...	0·17
1911	...	...	...	...	1	1	4	...	2	1	5	5	1	11	...	...	...	...	...	...	2