

Mr. R.D.R. Sweeting's report to the Local Government Board on diphtheria in the Farnham registration district / [R.D.R. Sweeting].

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Mr. R. D. R. Sweeting's Report to the Local Government Board
on Diphtheria in the Farnham Registration District.

GEORGE BUCHANAN,
Medical Department,
July 8, 1885.

THIS inquiry was ordered on account of excessive mortality from Diphtheria recorded by the Registrar-General as occurring during 1884 in each of the Registration Sub-divisions of the Farnham District, and in reference also to reported further prevalence of the disease this year at Ash in the same District.

The Farnham District, divided for registration purposes into two Sub-districts, Frimley and Farnham, comprises eight parishes, having a total area of 41,215 acres, and a population in 1881 of 40,395 persons. For purposes of sanitary administration, the Registration District is sub-divided into three Districts. Of these, by far the largest is the Farnham Rural Sanitary District, which is in effect the Registration District, less the parish of Aldershot and part of the parish of Farnham. The latter two sub-areas constitute respectively the Aldershot Urban Sanitary District, and the Farnham Urban Sanitary District.

This large Registration District comprises within its limits a considerable portion of the south-west of the County of Surrey from the junction of Surrey, Hampshire, and Berkshire on the north to Hind Head on the south. It consists, throughout, of undulating slopes and valleys, with much interspersed common and waste land. The North Downs extend into the District, as for instance the Hog's Back between Guildford and Farnham, and Hungry Hill between the latter place and Aldershot.

Water is very abundant; besides the Rivers Blackwater and Wey, countless stream-lets, becks, and ponds are found. The depth of the subsoil water is variable, but very near the surface in many parts.

The surface soil is mostly loam and gravel, of various depth and extent. Geologically it is on Bagshot and Folkestone Sands, Greensand, Gault, Chalk, London Clay, and Thames Gravel; further reference will be made to these formations in dealing with each Sanitary District.

The main industry of the Registration District is agriculture, which here includes hop cultivation. But in Aldershot, on account of its relations with the permanent Camps that have been established in the neighbourhood, there is a considerable trading element, and shopkeepers are numerous.

Passing now to consider Diphtheria in the Registration District, which has given occasion for this inquiry, it will be well to note first the mortality occurring there, during the last five years, from the seven chief zymotic diseases. This has accordingly been done in the following Table (A) constructed from the Quarterly Returns of the Registrar-General.

TABLE (A.)
Showing the MORTALITY in the FARNHAM REGISTRATION DISTRICT from SEVEN SPECIFIED
DISEASES during the Five Years 1880 to 1884.

Name of Sub-district.	Population in 1881.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	"Fever."	Diarrhoea.	Seven specified diseases.			
									Total deaths.	Mean annual deaths.	Mean annual rate per 1,000.	Mean annual Diphtheria rate per 1,000.
Frimley - -	27,009	1	19	18	79	54	30	118	319	64	2·3	·6
Farnham - -	13,386	2	11	4	35	35	15	26	128	26	1·9	·5
Farnham Registration District	40,395	3	30	22	114	89	45	144	447	90	2·2	·5

It is thus seen that in the five years more than one-fourth of the total mortality in the Registration District from the seven specified diseases has been due to Diphtheria, which, having regard to population, has affected both Sub-districts almost equally. In each Sub-district, too, the Diphtheria rate for the period amounts to about one-fourth of its total zymotic rate.

In Table (B.) differentiation of the Sub-district mortalities from Diphtheria is made according as the disease has affected the several Sanitary divisions of the Registration District.

TABLE (B.)

Showing the DEATHS registered from DIPHTHERIA in the several SANITARY DISTRICTS comprised in the FARNHAM REGISTRATION DISTRICT during the Ten Years 1875 to 1884.

Sub-district.	Sanitary District.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Total.	Diphtheria rate per 1,000 living.
Frimley	Aldershot Urban District. (Population in 1881, 20,155.)	-	-	-	-	-	-	-	1	10	29	40	1.9
	Part of Farnham Rural District (Population in 1881, 6,854.)	-	-	-	-	-	-	-	1	2	38	41	4.1
Farnham	Part of Farnham Rural District (Population in 1881, 8,898.)	3	1	2	2	-	-	-	1	12	3	18	4.0
	Farnham Urban District. (Population in 1881, 4,488.)	-	-	-	1	1	1	-	3	8	4	18	4.0
Registration District of Farnham		3	1	2	3	1	1	-	6	32	74	123	3.0

As directed by the Medical Officer of the Board, I sought, on arriving in the District, to learn what mortality from "Croup" and throat-illness generally had in each Sanitary District been associated with Diphtheria prevalence.

Upon examination for this purpose of the Sub-district local death registers, it quickly became apparent that in Frimley Sub-district, and almost wholly in that part of it included in the Aldershot Urban Sanitary District, "Croup" and "Laryngitis" had in recent years been very fatal to young children, and that the mortality thus caused in Aldershot, when added to that registered from Diphtheria there, gave rates of fatal throat-illness differing widely (especially in 1882 and 1883) from those based on Diphtheria mortality as recorded in the Quarterly Returns of the Registrar-General.

Similarly, as regards the Farnham Sub-district, deaths registered from "Croup" and "Laryngitis," when added to those from Diphtheria, raised the mortality from throat-illness to considerably more than that recorded as from Diphtheria alone in the Registrar-General's Returns. But the increase in the Farnham Sub-district thus determined was nothing like so great as that in the Frimley Sub-district, and especially in that part of it comprised in the Aldershot Urban Sanitary District. Moreover, in Farnham Sub-district, deaths from "Croup" and "Laryngitis" practically ceased to be registered after 1882, whereas in Frimley Sub-district, and especially in Aldershot, deaths from these complaints continued after this date to be recorded locally until the third quarter of 1884, in even greater abundance than before.

The facts here referred to are duly brought out in the subjoined Tables (C.) and (D.), the latter of which exhibits the respective mortality rates from Diphtheria, and from "Croup" and "Laryngitis," in each of the three Sanitary Districts comprised within the two Registration Sub-districts. An account of the Aldershot "Croup," and of its ramifications, will be given in some detail in dealing with the recent behaviour of Diphtheria in each of the several Sanitary Districts.



TABLE (C.)

Showing the INCIDENCE of FATAL THROAT-ILLNESS upon the several SANITARY DISTRICTS of the FARNHAM REGISTRATION DISTRICT QUARTERLY during the Five Years 1880 to 1884.

Sub-district.	Sanitary District.	1880.				1881.				1882.			
		i.	ii.	iii.	iv.	i.	ii.	iii.	iv.	i.	ii.	iii.	iv.
		Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.
Frimley	Aldershot Urban District. (Population in 1881, 29,155.)	-	†	-	-	*1	-	-	-	-	-	3	-
	Part of Farnham Rural District. (Population in 1881, 6,854.)	-	-	-	-	-	-	-	-	†	-	1	†
Farnham	Part of Farnham Rural District. (Population in 1881, 8,898.)	-	-	-	-	-	-	-	†	3	-	1	2
	Farnham Urban District. (Population in 1881, 4,488.)	-	-	†	-	1	-	-	-	-	2	1	-
Registration District of Farnham		-	†	†	-	2	-	-	-	†	4	2	6

Sub-district.	Sanitary District.	1883.				1884.				Total for the Five Years.	
		i.	ii.	iii.	iv.	i.	ii.	iii.	iv.	Diphtheria.	Croup and Laryngitis.
		Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.	Diphtheria. Croup and Laryngitis.		
Frimley	Aldershot Urban District. (Population in 1881, 29,155.)	1	-	3	†	3	†	3	†	41	4†
	Part of Farnham Rural District. (Population in 1881, 6,854.)	-	-	-	-	†	8	21	9	41	5
Farnham	Part of Farnham Rural District. (Population in 1881, 8,898.)	-	-	2	4	1	-	-	†	17	7
	Farnham Urban District. (Population in 1881, 4,488.)	3	-	1	-	1	1	2	-	16	3
Registration District of Farnham		4	-	6	5	7	4	31	22	115	56

* Not included in the Registrar-General's Return, probably by omission on the part of the local Registrar.

† The only occasions on which Croup appears to have been reported to the Registrar-General.

‡ Termed "Croupous Diphtheria," and not returned as Diphtheria to the Registrar-General.

TABLE (D.)

Giving the RATES per 1,000 living of MORTALITY from DIPHTHERIA, and from "CROUP" and "LARYNGITIS," in each SANITARY DISTRICT of the FARNHAM REGISTRATION DISTRICT during 1880 to 1884.

Sanitary District.	1880.			1881.			1882.			1883.			1884.			1880 to 1884 (Mean Annual Rate).
	Diphtheria.	Croup and Laryngitis.	Diphtheria, Croup, and Laryngitis.	Diphtheria.	Croup and Laryngitis.	Diphtheria, Croup, and Laryngitis.	Diphtheria.	Croup and Laryngitis.	Diphtheria, Croup, and Laryngitis.	Diphtheria.	Croup and Laryngitis.	Diphtheria, Croup, and Laryngitis.	Diphtheria.	Croup and Laryngitis.	Diphtheria, Croup, and Laryngitis.	
Aldershot Urban	·09	·09	·18	-	-	-	·09	·81	·90	·90	2·07	2·97	2·61	·72	3·33	1·47
Farnham Rural	-	-	-	-	·25	·25	·12	·24	·35	·84	-	·84	2·52	·18	2·70	·84
Farnham Urban	·22	·22	·44	-	-	-	·66	·22	·88	1·76	·22	1·98	·88	-	·88	1·05

I.—ALDERSHOT URBAN SANITARY DISTRICT.

[Acreage 4,178. Number of houses in 1881, 1,570; at present, 1,735. Population in 1881: town, 12,875; South Camp, 7,280; total, 20,155. Present population: town, 11,000; South Camp, 9,374; total, 20,374.]

Aldershot is at the extreme north-east of Hampshire adjacent to Surrey. It is three miles to the north-east of Farnham, and four miles south of Farnborough. Although the town of Aldershot comprises the bulk of the population of the Sanitary District, there are in addition several considerable groupings of population, *e.g.*, at West End, Redan Hill, and New Town. The South Camp, placed north of the town, between this and the Basingstoke Canal, is also in the Urban District. It is separated from the North Camp by the Canal. Geologically, Aldershot is chiefly upon London Clay, but extends also upon Lower and Upper Bagshot Sand. The town of Aldershot has sprung up within the last 30 years by the side of the South Camp, and is dependent for its prosperity upon the latter, intimate connexion therefore existing between them.

Sanitary circumstances.—Roads are mostly uneven, badly laid and paved. Houses, especially new ones, are generally irregularly placed; many have been hastily built and erected, apparently without proper foundation, and with improper material. The Sanitary Authority exercises the most cursory control over the erection of new buildings, and the building byelaws are of a very inefficient character. Back-to-back and cellar dwellings are found in some parts of the district. *Excrement disposal.*—The water-carriage system is in use throughout the whole of Aldershot, except "West End," where cesspit privies abound. Hopper closets, usually untrapped below, are the most ordinary form of closet in use, though the pan and container with D trap is also met with. The vast majority of closets are without water supply, and depend therefore upon hand-flushing alone. As a result, most of the closets that I saw in Aldershot were in a foul condition from retention of fæces on the upper side of the hopper, and in some instances the contents of the closets were found to be overflowing the seat. *Refuse disposal.*—House refuse is deposited usually in ashpits, which are seldom cemented, and often not bricked; it is in some cases merely disposed in heaps on the ground. The Sanitary Authority contracts for removal of refuse. *Water supply.*—A private Company, the Aldershot Water Company, supplies the greater part of Aldershot, more than two-thirds of the whole. But a great many houses still depend upon wells which are mere surface wells, though the public supply could easily be extended to them; and at "West End" the only source for many houses is a surface spring. The Aldershot Company's water is derived by pumping from water-bearing Chalk strata below the London Clay and Greensand at a depth of 240 feet from the surface. It is pumped to two reservoirs at Anger Copse, capable together of holding three million gallons of water, and descends thence by gravitation to the town, being delivered to separate taps in most of the houses, but to stand-pipes occasionally. This water is rich in carbonate of lime, and its hardness amounts to 16° (Clark's scale), but I heard no complaint from inhabitants on this score. The water-rate is levied at the rate of six per cent. on the rateable value of houses. *Drainage.*—A main drainage system exists at Aldershot, taking in the whole inhabited Local Board District, except the West End part and South Camp. Starting as 12-inch pipes at the Cambridge Hotel, these join 18-inch ones, which drain the main parts of Aldershot, these in turn joining a 24-inch circular brick sewer along the Ash Road. Manholes are placed at junctions, and 63 exist for every square mile. Ventilation is carried out partly at these manholes, and partly by street level ventilators, which are few in number, inadequate in size, and blocked by road *débris*. The flushing provided is inefficient; it is by the use of hydrants at summit manholes; no automatic provision exists. Storm water is got rid of by a separate system of pipes, placed in the central parts of the town alongside the main sewers, and delivering it to ditches and ponds near the outlet. The Aldershot sewage is treated at the Ash Bridge Sewage Works managed by Messrs. Hanson, who are paid 400*l.* a year for this service by the Aldershot Urban Sanitary Authority. The two-foot brick sewer in Ash Road conveys the raw material to the Sewage Works, where it is at once treated by Hanson's process (lime and soda-waste), and then pumped into settling tanks. The effluent is drawn off from time to time, passing into a small tributary of the Blackwater, the sludge being given to a man who undertakes the cleaning of the tanks; he sells the sludge for what he can get to the farmers. At the time of my visit, some of this sludge had not been removed, and was mixed with rain-water, emitting a disagreeable odour. The beck which receives the sewage effluent is

rather turbid, but inasmuch as refuse of adjacent bone manure works and of gas-works also enters this stream, it is not easy to estimate the amount of turbidity due to each of these several polluting agents. Complaint of noisome smell from the sewage works has been made; but here again it would be difficult to differentiate between smells from sewage, manure, and gas-works. There has also been free ascription, locally, of Diphtheria to the Aldershot Sewage Works, but on what grounds it is difficult to say. Coming now to house drainage, it is the exception for soil pipes to be ventilated, and where this has been attempted the bore of the ventilators is invariably too small for the purpose. Sink-pipes are seldom trapped, and I met with no instance where they did not directly enter the drain. Rain-water spouts are usually in direct connexion with the drain, but occasionally are met with emptying over gullies or into tubs. Finally, house drains are usually not disconnected from the main sewer by any trapping, or disconnexion chambers; nor are they ventilated. *Slaughter-houses*.—Two of these exist, both registered by the Authority. One of them was clean, well paved, and well drained, but the other was faulty in these respects. *Common lodging-houses* are two in number; both were found clean, well-lighted, well-ventilated, and possessed of adequate privy accommodation.

Diphtheria prevalence.—It has been seen in Table (C.) that 82 fatal cases of throat-illness have been registered in the Aldershot Urban Sanitary District during the five years 1880 to 1884, of which 41 were described as Diphtheria, and 41 as "Croup" or "Laryngitis." The first death in the period under examination was one from "Croup" at the South Camp, and took place in the first quarter of 1880. Another death, of a person aged 65 years, recorded as Diphtheria in the local register, which took place in the fourth quarter of 1880, does not appear in the Registrar-General's Quarterly Return (see foot-note to Table C.). No deaths from any of the diseases mentioned were registered during the whole of 1881. In 1882, nine-tenths of the mortality from throat-illness was referred to "Croup," and was so represented by all the civil practitioners (including the Medical Officer of Health), and one military surgeon. In 1883, two-thirds of the fatal throat cases were described as "Croup" or "Laryngitis," by both civil and military practitioners, the first deaths occurring in the South Camp. In 1884, one-fifth of fatal throat-illness was certified as "Croup" or "Laryngitis," inclusive of one described as "Croupous Diphtheria." But in the first quarter of 1885, of 10 deaths from throat affections, one only was not referred to Diphtheria.

The gradually vanishing excess here shewn of deaths registered as due to "Croup" or "Laryngitis," over deaths registered as due to Diphtheria, a diminution in three years from nine-tenths to one-tenth of the total mortality from acute throat disease, would appear to indicate, on the part of medical practitioners generally in Aldershot, a slow if not reluctant recognition of the true nature and dangerous qualities of the throat malady that has manifestly been long domesticated in their midst.

My investigations made it clear that deaths registered respectively as "Croup," "Laryngitis," and the like had been unquestionably deaths from Diphtheria; for, (1) the clinical description, as elicited from parents, was altogether that of Diphtheria; a large proportion of the cases had membrane on the pharynx, and all had difficulty in swallowing; (2) Diphtheria commonly existed coincidently in the same family along with "Croup" or "Laryngitis"; (3) these diseases followed Diphtheria in the same family; and, again, Diphtheria followed them: thus, instances were forthcoming of "Croup" and "Laryngitis" caught from what was medically recognised as Diphtheria, and of "Croup" and "Laryngitis," thus acquired, themselves in turn followed by true Diphtheria.

The age-incidence of the fatal throat-illness in Aldershot that has continued to be registered month by month, without a break, from March 1883 to March 1885, has been mainly on children under 5 years, 60 per cent. of the total deaths occurring at this period. The ages at death ranged from 5 months to 19 years. Year by year, too, the chief mortality occurred, as with Diphtheria, in the latter part of the year, as may be seen by reference to Table (C.)

In short, there can be no question that the same disease which has been fatally prevalent since 1881 in the Farnham Urban and the Farnham Rural Sanitary Districts, and has been habitually registered there as Diphtheria, has been in the same period fatally prevalent in the Aldershot Urban Sanitary District, where it has been (until the last two quarters of 1884) registered with much uniformity as "Croup" or "Laryngitis."

Fatal Diphtheria, then, under one or another name, has been generally diffused over Aldershot. In addition, I received information during my inquiry of numerous non-

fatal cases of "Sore throat," "Ulcerated throat" and "Tonsillitis," affecting chiefly young adults in the first and fourth quarters of the year 1884. Such malady has attacked both the well-to-do and the humble classes, large roomy residences and small ill-ventilated cottages, districts connected with the main sewer, and others having no connexion with it, houses supplied with the public water service, and houses dependent upon local wells. Tradespeople, however, would seem to have suffered in excess of other persons. Thus, of 37 deaths from throat-illness in 1884, 14 occurred at shops. This marked incidence upon shops may have been partly due to infection conveyed to them from houses in the town, or from the Camp, and caused them also to act as *foci* of the further spread of disease. No special local insanitary condition could be pointed to as having determined the behaviour of the Diphtheria in Aldershot. But there seems little doubt that extension of the disease was greatly facilitated by its extremely tardy recognition; by utter absence of attempt at isolating the sick* when the true nature of the malady was at length made out; and generally, by complete neglect on the part of the Sanitary Authority of any serious step to deal with the epidemic. Unguarded personal intercourse between Camp and Town, and within the limits of each, seems to have been an important factor in dissemination of Diphtheria in the two places.

After due investigation, school influence was not found to have contributed any material share in the propagation of throat-sickness; for, although first sufferers in families were occasionally found to be school attendants, yet the schools attended by Aldershot children were many and various, and in no case was exceptional incidence found upon any particular school. Milk circumstances were also inquired into, but excluded from any part in the furtherance of throat-complaint.

The relative incidence of fatal throat-illness upon Camp and Town must now be considered, as well as the question as to whether the one derived Diphtheria from the other. In seeking to ascertain the former, it must be premised that some cases living in the Town died in the Camp (*e.g.*, soldiers' children removed to the infectious hut attached to the Cambridge Hospital); and also that other cases which died in the Town were connected with the Camp, such as officers' children. With these reservations, and regarding deaths certified by military surgeons as Camp deaths, and those certified by civil practitioners as Town deaths, the mortality rate of the Camp during the period January 1st, 1882, to March 31st, 1885, is found to have been 2.1 per 1,000 (taken on the mean population during that time), and that of the Town 5.5 per 1,000 (taken on the mean of the enumerated population in 1881 and that estimated for 1885). Thus fatal incidence has been greater upon the Town than upon the Camp, though of course not quite so much greater as the above rates, calculated on total population without allowing for differing proportion of children, would seem to indicate. It may be worth asking whether the isolation which has been carried out at the Camp has not had some share in this result. Personal communication of the freest kind exists between Camp and Town, the two constituting practically one place. Hence, if Diphtheria were introduced into one of them, its spread to the other would be an easy matter. In 1882, fatal "Croup" was entirely confined to the Town, but some of the deaths were in families connected with the Camp. In 1883, mortality from throat affections began in the Camp, but was in probable sequence to fatal "Croup" and "Laryngitis" in the Town during the latter end of 1882. In 1884 and 1885, fatal throat-illness occurred indiscriminately in Camp and Town, following upon that in 1883. In the matter of importation of disease from beyond the District, too, each may be considered as equally exposed to this influence. Aldershot has abundant opportunity for the introduction of infectious disease, being related, by reason of its military activity, to a great part of the country. The constant passage of troops to and from it, the arrival of militia recruits from rural parts for training purposes, the advent of visitors to the Camp from time to time, especially during holiday seasons, all afford occasion for the importation of a disease like Diphtheria.

The deaths at the South Camp have been mostly children of married soldiers, though a private in the Hussars (æt. 19) succumbed. The married quarters are wooden huts lined with felt, and of ample cubic capacity. Excrement is disposed in hopper-closets, the sewage of the Camp being conveyed to a sewage farm near Farnborough. Water is delivered to stand-pipes from a reservoir receiving water from upland slopes. Ashes and other refuse are disposed in pails and frequently removed. Slops are usually thrown down the hopper-closets.

* Exception must be made for the South Camp, where a hut is utilized for infectious cases; but the position of this (surrounded by other huts) is unsatisfactory, and I understand that a more suitable site is in course of being acquired.

Measures taken by the Authority to check epidemic Diphtheria.—Although fatal throat-illness has occurred without any interruption since March 1883, the Sanitary Authority has not instituted any adequate measures to check or control it. No hospital provision of any kind exists in the Town, though home isolation, except amongst better-class people, is quite unattainable. Until the autumn of 1884 no regular disinfection was practised; since then, some chlorine fumigation of rooms has been resorted to, but clothes and belongings are not removed for disinfection. No chamber for disinfection, or public mortuary, is provided. No steps have been taken by the Sanitary Authority to obtain information as to the occurrence of non-fatal cases of throat-illness in the District; and no warnings to people as to the danger of communication between healthy and sick have been issued.

Sanitary Administration.—The Local Board consists of 12 members, 3 of whom are military men, representing the Camp. The Clerk is Mr. W. E. Foster, Solicitor, who receives 130*l.* a year for his services. Dr. J. Shoolbraid is Medical Officer of Health, at a remuneration of 30*l.* a year; he is not under Order of the Local Government Board. Mr. W. L. Coulson is Surveyor, receiving 175*l.* per annum for the work he performs, and is debarred from private employment. Mr. G. Carter is Inspector of Nuisances, at a salary of 50*l.* per annum. The sanitary affairs of the South Camp are managed by the Sanitary Officer of the Camp, who is at present Brigade-Surgeon MacDowell, C.B.

Postscript.—Since the above was written, I have received information that during the four weeks ending May 27th, seven deaths from Diphtheria and "Croup" have occurred in Aldershot, of which six were in the Town.

II.—FARNHAM URBAN SANITARY DISTRICT.

[Acreage in 1881, 260; acreage of the Local Board District as recently extended, 795. Houses in 1881, 937; at present, 1,064. Population in 1881, 4,488; present population, 5,080.]

This Sanitary District was, by provisional Order dated May 23rd, 1884, increased in extent by the inclusion of a considerable area of the adjacent Rural District.

Farnham is situated on the Wey, at the extreme west of the County of Surrey, and on the confines of Hampshire. It is ten miles to the west and rather south of Guildford, and seven miles north-east of Alton. The town extends in straggling fashion over a wide area, but is mainly situate on low-lying land bordering the Wey and its tributaries, though it extends also up the slopes of the hills which encompass the town. Geologically, Farnham is partly on Chalk, partly on the upper Greensand, but mostly on Gault.

Sanitary circumstances.—Old-fashioned substantially-built brick residences, inhabited by well-to-do people, abound in Farnham, besides many old dilapidated thatched and tiled cottages. In recent years modern brick terraces and villas have been built in increasing number. Floors and foundations of cottages are in many instances damp and sodden. The main roads of Farnham are wide and excellently laid, but side streets are as a rule uneven and badly paved. *Excrement* is disposed of in privies, the cesspits of which are generally bricked at the sides and covered with a wooden hinged flap. In some cases, they are mere hollows in the ground, covered by house refuse; and they are often on a higher level than adjacent shallow wells. Midden privies, receiving both excrement and ashes, also exist in some parts of Farnham; these are roofed, but not ventilated, and are, moreover, excavated below the ground level. Middle-class houses have water-closets, draining to cesspools. The latter are seldom ventilated, neither are the soil-pipes of the water-closets. The position of closets is open to objection, situated as they are inside the house, unseparated by cross-ventilation from other rooms, and often close to larders. *Refuse* is disposed in open bricked ash-pits for the most part, which are in many cases foul-smelling and very near to houses. In other cases refuse is thrown upon the ground or even into open ditches. The Sanitary Authority contracts for removal of house refuse, but is contemplating undertaking this duty itself. *Water-supply.*—According to a return made by the Surveyor to the Local Board, 207 houses are supplied with water by the Farnham Water Company, 87 with this and well water besides, 751 with wells only, and 19 have no water supply. The Farnham Water Company has two gathering grounds, viz., at Hungry Hill and Warren Corner, of about 40 acres extent. Six-inch pipes convey water from the springs of these gathering grounds to a service reservoir, capable of holding 60,000 gallons, at Castle Hill, whence it is distributed by gravitation to the town. The Secretary to the Company acknowledges that the supply is inadequate, especially

during seasons of drought; and this, too, although less than one-third of the houses in the town are supplied with the water. The sinking of bore-tubes in search of water-bearing strata, and the erection of suitable pumping plant in connexion with them, are, however, under serious contemplation by the Company. Water rates are levied according to a sliding scale, being seven per cent. of the rateable value on houses up to 20*l.* Twelve shillings is the minimum charge; hence few houses rated at less than 8*l.* 15*s.* take water from the Company. The wells of Farnham are nearly all shallow wells, in close apposition for the most part to privy cesspits; they are liable therefore to receive foul soakage. *Drainage* at present.—Old brick rubble drains of the worst type exist, draining to open ditches and watercourses joining the Wey. But these are to be shortly abolished *en masse*; a drainage scheme has been approved by the Local Government Board, and the contracts for it were let before my inquiry was terminated. The *new system* is to provide for the drainage of the whole of the extended Local Board District, and the scheme comprises the laying of 9-inch and 12-inch glazed stoneware pipes throughout the District, and also of a 12-inch cast-iron gravitating sewer in the centre of the town and along the Wey, for the purpose of shutting out subsoil water from the sewers. These sewers are to converge to a pumping station, from which the sewage is to be pumped to a field of 12 acres extent, consisting of gravel overlying chalk, there to be treated by intermittent downward filtration. The filtration areas are to be regularly underdrained at a depth of 6 feet below the surface, and rain and surface water are to be rigorously excluded. The effluent will be discharged into a tributary streamlet of the river Wey. Ventilation of this system of sewerage is to be provided by man-holes and lamp-holes, situated about 16 to the mile. Flushing will be carried out by means of three automatic flushing chambers, in one of which brewery waste is to be received and used for flushing purposes. Inspection shafts are also to be provided at suitable points.

Rain spouts either enter the existing brick drains direct, or are received into tubs, but in many places they empty their contents directly on the ground. Sink pipes are usually untrapped, and connected directly with slop cesspools. Some bath waste-pipes were found to open externally over gullies.

Slaughter-houses.—There are three of these in Farnham; they are registered, but the byelaws regulating them are meagre and inadequate. Slaughtering is done chiefly in open yards, and refuse finds its way to foul open cesspools, or even to ditches flowing at the back of houses. Where channelling exists, it is imperfect and insufficient; such drainage of slaughter-houses as is provided is eventually to ditches, *via* a series of small cesspools overflowing one into another. Pig-killing is very common, and apparently unregulated.

Common Lodging-houses.—Three are registered in Farnham, two of them being Inns. They all appeared clean, whitewashed, and fairly well ventilated.

Diphtheria prevalence.—It will be noticed from Table (B.) that the first death recorded from Diphtheria in the Farnham Urban Sanitary District during the ten years 1875 to 1884 was in the fourth quarter of 1878. This was a child (æ.t. 4) who died in Abbey Street on October 1st. The case was an imported one, having been brought there ill from near the North Camp, in a different Registration District. The next fatal case occurred at Park Lane, East Street, in January in 1879. Nothing is known as to its origin, though "white throat" is said to have prevailed in East Street in the late autumn of 1878. In May 1880, a death from "Croup" was registered at Babb's Mead, and in December of that year a child of 8 years died of Diphtheria at the "Borough." The latter case did not owe its infection to Farnham, for the child had been ill for six weeks with Diphtheria at Brighton, and death occurred during convalescence after return to Farnham. As regards the "Croup" death in May 1880, it deserves recording that "white throats," and undoubted but mild Diphtheria, had continued to be reported by the Medical Officer of Health during 1879 and in May 1880. No deaths from Diphtheria were registered in the town in 1881, but mild cases of the disease occurred from time to time, and contagious sore throats existed in great numbers. The same is true of the first two months of 1882, but in March 1882 two deaths and in May one death from Diphtheria were recorded, all in East Street. Since this street suffered greatly from prevalence of the disease, it would seem opportune to give a brief description of its chief features. It is a main road, situated upon a somewhat elevated ridge or plateau overlooking low-lying alluvial meadows, and is inhabited chiefly by labourers and petty tradesmen, though some better-class houses exist here. A ditch runs at the back of the houses on the north side of the street, which even now receives house-slops, but at the time of the occurrence of fatal Diphtheria in the spring of

1882 received, it is said, also faeces from privies on its banks. Old leaking brick-drains abound here. Sore throat existed in East Street, both before and after the fatal cases in March 1882; and the infection of the fatal cases, both in March and May, may therefore be held to have been derived by direct sequence from previous cases. Further, sore throats that may have been suspected to have been Diphtheria continued to occur in East Street during May and June 1882. In September, a child (æt. 3) died in West Street of "Croup" following Measles. During November and December 1882, diphtheritic sore throats were recognised in Church Lane, and other parts of Farnham. Such sore throats continued to occur during January 1883, and on the 21st of the month a death was recorded from Diphtheria in Bridge Square. Sore throats still continued rife after this during February; and the next death from Diphtheria was on March 1st, in Church Lane. Between this date and January 2nd, 1884, 9 deaths from Diphtheria took place (one of them certified as "Croup"), all in children under 10 years of age, and mostly in the 4th quarter of the year. Many non-fatal cases were heard of, as well as the so-called "white throats," in the intervals between fatal cases. These white throats were observed to be more numerous during the autumn months. Spread of the disease seems to have been effected by personal communication and family relationship, and infection was perhaps occasionally transmitted in a mediate way. School influence was set aside as having had no special influence on the spread of Diphtheria, on its being found that there was no community of school attendance amongst the infected, though there was some suspicion of dissemination of infection by meeting together of children at a particular Sunday school. Milk distribution was also looked into, but excluded from any share in the spread of the disease, when it was found that there was no community of supply amongst the attacked, and no marked incidence upon the users of any particular milk.

After the death in January 1884, no more were registered until May, when a child (æt. 3) died at a public-house in the "Borough." Two more deaths took place in the town in 1884, during August and September, since which time the disease has shown no fatality. But prior to the May death, and between this and the other deaths in 1884, many non-fatal cases of true Diphtheria were observed, as well as diphtheritic sore throats. Also, since September 1884, and up to the present time, these links between true fatal Diphtheria cases have been more or less abundant in Farnham.

My acknowledgments are due to the Medical Officer of Health for much valuable information extracted from his excellent Monthly Reports.

To sum up:—(1) Diphtheria has been several times imported into Farnham town; (2) it has in one form or other been present, with scarcely a break, since the autumn of 1878; (3) the disease in its fatal form has since 1882 acquired firm hold upon the district; (4) its spread has been effected by personal communication, aided by absence of isolation of the persons affected.

Measures taken to check the prevalence of epidemic diseases.—No adequate steps have been taken by the Sanitary Authority to check the progress of Diphtheria, or of any other epidemic disease, in the Farnham Urban Sanitary District. No hospital isolation has been provided. No serious disinfection has been practised. No means for securing notification of infectious disease to the Medical Officer of Health have been adopted.

Sanitary Administration.—The Local Board consists of 12 members. Mr. Mason, Solicitor, is Clerk, receiving 100*l.* *per annum*. Mr. S. G. Sloman, jun., is Health Officer at a remuneration of 25*l.* *per annum*, and is not under Order of the Local Government Board. Mr. Hankins, the Surveyor and Inspector of Nuisances, receives a yearly stipend of 132*l.*, and is debarred from other employment.

The bye-laws of this Sanitary Authority are based upon the Public Health Act of 1848; they are capable of improvement in several important particulars.

III.—FARNHAM RURAL SANITARY DISTRICT.

[Acreage in 1881, 36,777.* Houses in 1881, 3,171†. Population in 1881, 15,752.‡]

This large agricultural district, which virtually consists of the entire Registration District of Farnham, *minus* the towns of Farnham and Aldershot, is made up of seven

* This is now diminished by 535 acres, recently added to the Farnham Urban Sanitary District.

† 127 of these are now included in the extended Local Board District of Farnham.

‡ 550 of these are now comprised within the newly extended Farnham Urban District.

separate parishes; viz., Ash, Seale, Frimley, Frensham, Waverley, Dockenfield, and the extra-urban portion of the parish of Farnham. These parishes will now be separately passed in review, both as to their general sanitary circumstances, and as to the prevalence and behaviour of Diphtheria within them.

(a) *Ash.*

This is a large straggling parish of 6,324 acres, situate north-east of Aldershot, and in direct continuity with it. It is placed both upon Lower Bagshot Sand and London Clay; and it contains much common land covered by heather.

Sanitary circumstances.—Most of the dwellings are thatched and tiled cottages, though there is a residential part in Ash Vale, which contains modern mansions, inhabited by retired merchants and military men. The cottages are for the most part small, rudely constructed, and ill-ventilated, though here and there newer ones are found, which are better contrived and built. Wooden huts, built by military pensioners and inhabited by them, are also found. *Excrement* is disposed in pit-privies chiefly, these being usually mere holes in the ground, loosely covered by planks, matting, or loose tree-boughs; their emptying is left to the tenant of each cottage, and they are seldom cleared before they are overfull. In the better-class houses of Ash Vale, water-closets drained to cesspools are in vogue; the cesspools are usually cemented, but rarely ventilated, and the Sanitary Authority does not undertake their scavenging. In addition, earth-closets are to be met with in some houses, and a sort of pail system in others. *Refuse* is commonly placed in a hole dug in the garden, but sometimes ashes are sprinkled on the soil. Moist accumulations of ashes and vegetable matter are not infrequently deposited close to the well supplying drinking water. *Water* is obtained from wells, some deep, and others shallow dip-wells, and also from surface springs. The shallow wells predominate; they are lined with loosely-placed bricks, and often situate close to foul unemptied cesspits, and on a lower level than these. Each house has usually its own well, but in some cases a single well is made to suffice for a group of cottages. *Sewerage*, properly so called, does not exist. In the greater part of Ash, slops are thrown haphazard on the ground, and find their way into open ditches by the roadside, to which farm-yard refuse also gets access. But in Ash Vale liquid house refuse is conducted by pipes from sinks to cesspools, the pipes usually emptying over open and trapped gullies. Rain-spouts are for the most part directed into tubs, but in the Vale district they also commonly enter directly the drain leading to the cesspool.

Diphtheria prevalence.—The first death from Diphtheria registered in Ash during the ten years 1875 to 1884 was in July 1882. No more deaths from the disease occurred in that year, and in 1883 only two were registered,—one in October and one in November. But in 1884 no less than 25 deaths have been recorded from Diphtheria in the parish,* and in 1885 up to the 7th April 7 more have been added to the list. The *time-distribution* of these fatal Diphtheria cases in Ash has been monthly as follows:—

1884.—May	-	-	-	6	1884.—November	-	-	1
June	-	-	-	1	December	-	-	2
July	-	-	-	8	1885.—February	-	-	4
August	-	-	-	3	March	-	-	2
September	-	-	-	3	April (to 7th)	-	-	1
October	-	-	-	1				—
				—				—
Total	-	-	-	22	Total	-	-	10
				—				—

The *age* at which death occurred ranged from 9 months to 13 years, nine being under five years, 19 between 5 and 10 years, and four over 10 years. Seven-eighths of the cases were, therefore, under 10 years. The population of the parish of Ash, according to the Census of 1881, is 1,930. Thus, the mortality rate of Diphtheria was in 1884 equal to 13 per 1,000. But if the villages of Wyke and Normandy, and the part of Worpleston (containing 204 persons) which are comprised within the parish, but which furnished no Diphtheria deaths, be excluded from the

* This includes two Ash children, *et.* 6 and 9 years respectively, who were removed ill to the Farnham Workhouse Infirmary, and died there.

computation, the mortality rate upon Ash proper will be found to be as high as 17·8 per 1,000. The total number of cases during 1884 that came to my knowledge during the inquiry was about 80, so that this would represent an *attack-rate* upon Ash proper of about 57 per 1,000 of population, and a *mortality* from the disease equal to over 30 per cent. of attacks.

On making inquiry into the origin of Diphtheria in Ash, I found that the case in July 1882 occurred at an isolated park-lodge; that the girl (æ. 11) was an attendant at Pirbright school, which was closed during part of the summer of 1882 on account of the prevalence of Diphtheria in the parish. (See Mr. Power's Report on Diphtheria at Pirbright.) Pirbright school was re-opened on June 27th after closure; the girl from the park-lodge in Ash attended school on that day, and was attacked on June 29th. In view of these facts, and the evidence adduced by Mr. Power in his above-mentioned Report as to the part played by the school in the dissemination of the complaint, it may be believed that this girl received her infection at Pirbright school. The two cases of Diphtheria at Ash in 1883 occurred in contiguous houses on Windmill Hill, respectively on October 24th and November 10th. The second case was directly related to the first, and this doubtless derived its infection from Aldershot in the following way. Free family inter-communication existed with relatives at the Deadbrook Farm, Aldershot, and the children of both families worked together in the potato-fields, using the same bottle for drinking purposes. In the Deadbrook Farm family a case of so-called "Croup" (itself in relation with antecedent Diphtheria in Aldershot) preceded by a few days the attack of the child from Windmill Hill, Ash.

Coming now to 1884, the first fatal case occurred on May 8th in the person of a boy (æ. 8) residing at Ash Common, but attending the Ash Street School. Previous to this boy's attack, a girl who attended the same school, though living in an isolated part of Poyle, in the neighbouring parish of Wanborough in the Guildford Union, whilst at school on April 30th was found to be suffering from Diphtheria, was sent home, and died on May 4th. The Ash Common case was the first that was fatal in the place during 1884, and no mild Diphtheria or sore throat was known to have preceded it, so that it is extremely probable that the boy in question received his infection at school from the Poyle girl. The origin of this girl's infection is interesting. Her mother was in the habit of frequenting an inn in Ash Road, Aldershot, for purposes of refreshment and of selling eggs, and occasionally took the daughter with her. A death from Diphtheria occurred at this inn six days before the attack of the daughter, and the mother remembered calling there at about the time the child at the inn was dangerously ill, though unable to recollect if her own daughter accompanied her on this occasion. There is here, therefore, a strong suspicion that the Poyle case which infected fatally the first Ash case in 1884 was itself infected from Aldershot; and the relation of Ash Diphtheria, by means of the Poyle link, with that of Aldershot, where the disease had been fatally prevalent under various names since March 1883, may now be assumed. The practical continuity, too, of Aldershot and Ash, and the numerous channels of inter-communication of the latter with the former, must not be disregarded. On examining the conditions of *spread* of Diphtheria in Ash, opportunities of direct infection were afforded by habits of personal communication, *e.g.*, playing together of children in the streets and on the greens, kissing, the trooping together of children in the hop gardens, and the meeting of boys at the church choir. Instances of apparent infection by mediate channels were forthcoming in the passing of those engaged in nursing the sick from infected to non-infected houses; in the calling at cottages of hawkers of goods, who had children ill at home; and in the attacks of occupiers of small shops frequented by customers from houses where the disease was prevailing.

School influence played also an important part. It has been seen that the first death in Ash was not improbably caused by direct infection at school from an outside case coming to Ash Street school. Besides this, the dissemination of the disease was largely aided by the assemblage of children at this school; for (1) the "first attacks" in families were most usually attendants at the school, and these thus started the disease in their respective homes; (2) children were attacked upon the re-opening of school, who remained free during its closure; (3) many children who suffered were attending school regularly up to the date of their attack. Further, the school was open from July 7th to July 12th, having been previously closed for a fortnight; and following this re-opening, eight deaths occurred between the 10th July and the end of the month (representing over 20 attacks), of which seven were of

school age and attendants at school.* Similar sudden development of fatal Diphtheria was witnessed shortly after the re-opening from November 24th to December 6th, though not to the same extent.

Escapes were related to age,—infants under 2 years and children over 14 years, for the most part escaping, though two babies, *æ*t. 6 and 9 months respectively, were attacked, of whom the latter died, and some adults and old people suffered. Parents who took the precaution of keeping their children from school at the time of successive re-openings, and forbade them to play with other children in the street, were often rewarded by the immunity from attack of their families. It was noticed, too, that better-class people, who possessed means of isolating, suffered no second invasion in their families;† whilst the removal of the two early cases to Farnham Workhouse Infirmary was followed by a cessation of the epidemic in the row of cottages from which they were removed. Milk distribution, and the condition of the farms whence the milk came, were inquired into, but set aside as having no influence in spreading the disease. Neither was any relation between animal illness and human Diphtheria found.

The conclusion seems, then, warranted that personal communication of various sorts, school attendance, and absence of any isolation, either at home or in hospital, were the three main factors influencing the spread of Diphtheria in Ash during 1884.‡

Fatality was also apparently related to age, 26 of the 32 fatal cases being between 2 and 10 years of age, whilst no death above 14 years was recorded.

Minor sore throat existed in families coincidently with true Diphtheria, and in some cases a trivial throat affection appeared to give rise by direct infection to severe and fatal Diphtheria. Again, cases deriving infection from a common source showed some, membrane, others none at all; the latter cases suggest the existence of an abortive form of Diphtheria analogous to that of "Small-pox without eruption." Suspicion of early infectiousness of the disease, in its pre-exudative stage, was also afforded.

The questions of physical circumstances and grouping of houses in determining attack were inquired into; and although in Ash Vale and Ash Common low-lying and clustered houses escaped, whilst those situate on elevations and ridges, and isolated one from another, were attacked, yet in the larger part of Ash, *viz.*, Ash Street, this contrast was not observed. And indeed these factors, though duly considered, were judged to be subsidiary to that of personal communication in the determination of attack. The immunity of Wyke, Normandy, and the portion of Worplesdon in Ash may be explained by reference to their straggling, disconnected characters, which lessen the chances of mutual intercourse of their inhabitants, as well as their distance from Aldershot, and comparative freedom of communication with this place; they also contributed no children to the Ash Schools.

No means but school closure were taken in Ash by the Rural Authority to limit the extension of Diphtheria. Disinfection was practised, but no sustained attempt at isolation was made. On the first death occurring in Ash, the Ash Street Schools were closed from May 8th to June 7th; they were then re-opened until June 24th, and closed on that day until July 7th. They were then in operation for five days; following which, prolonged closure (until November 24th) was carried out. They were again open from November 24th to December 6th, but closed on that day until December 29th, since which date they have remained open. Ash Common School was closed, from (1) May 8th to June 7th; (2) July 12th to November 24th; (3) December 6th to December 29th. Since the latter date, they, too, have remained open. The operations of the schools may be thus shown:—

Schools open.	Schools closed.
June 7th—June 24th.	May 8th—June 7th.
June 24th—July 7th (Ash Common only).	June 24th—July 7th (Ash Street only).
July 7th—July 12th.	July 12th—November 24th.
November 24th—December 6th.	December 6th—December 29th.

* There are two schools at Ash, *viz.*, Ash Common School and Ash Street School; the majority of Ash children attend the latter. I found them both well built, adequately lighted, and on the whole well ventilated, (though the Infant room at Ash Street might be improved in this particular). There was no overcrowding. Garden mould and ashes are thrown down the cesspit privies daily; the urinals are also drained to the cesspits, which have been recently cemented and ventilated, and are emptied when full.

† Thus, a child at the Rectory was attacked on December 26th with "Croup," but no further invasion of the family occurred, though, at least, one other was of susceptible age.

‡ The influence of season upon the faculty of spread of Diphtheria was displayed in the fact that the disease did not extend so rapidly in June as later, particularly during August and September.

So that the Ash Schools were closed for a period four times as long as they were opened. Although these repeated school closures may have been of some benefit to Ash, as shown by the fact that there was exacerbation of the disease on their respective re-openings, yet it must be confessed that the procedure as a whole, unaccompanied as it was by any isolation provision on the part of the Authority, has offered no material assistance towards the checking of the epidemic, whilst depriving the inhabitants of the benefits of education for a long period.

(b) *Seale.*

This is a sparsely populated parish of about 3,000 acres extent, situate due east of Farnham, and south of Ash. Its inhabited areas are disconnected, part being situate south, and part north of the Hog's Back. Its geological position is much the same as that of Ash, viz.:—on Lower Bagshot Sand and London Clay.

Sanitary circumstances.—Some of the older thatched cottages are very dilapidated, the roofs and walls falling in; but in parts of Seale proper, many brick-built houses have been lately erected. *Excrement* is disposed in pit-privies, which are usually mere openings in the earth, rarely bricked (and then most imperfectly), never ventilated nor properly covered; they are seldom cleared, and commonly overflow into open ditches. In some parts of Tongham, oat husks are mixed with privy contents in order to deaden the smell; ashes and vegetable refuse, too, are frequently cast into the privy. *Refuse* is got rid of down privies also, or by throwing it on to extemporized ash-heaps in the gardens. *Water supply.*—Seale proper, which is upon high Chalk chiefly, is dependent almost entirely upon rain-water, which is retained in underground tanks; a few shallow wells also exist. In Tongham, deep wells sunk through London Clay into Chalk are the rule, but these are too often in close proximity to foul privies and slop cesspools. *Drainage.*—House slops are either thrown on the ground, or directed by rude channels to holes in the earth used as cesspools. In a few Tongham cottages, sink-pipes leading to cesspools are found; they are always untrapped, but the cesspools uncovered.

Diphtheria prevalence.—The first fatal case of Diphtheria recorded in Seale parish in the 5 years under consideration took place on May 18th, 1884, in Tongham. From that date to August 24th seven deaths occurred in four families, all of them in Tongham. In point of time, two of these deaths were at the end of July, and the rest in a few weeks of July and August. The age of these eight fatal cases ranged from 2 to 10 years, six of them being over 5 years. The first case, that in May, was an attendant at Ash Street School, into which the disease had been introduced previous to his attack. He may, therefore, be regarded as having derived his infection there. No deaths were recorded between May 18th and July 25th; but numerous non-fatal, though tolerably severe, cases were noticed during June and the early part of July. Once established in Tongham, the spread of the disease was made easy by absence of any isolation of the sick, by free visiting amongst neighbours, meeting together at chapel, at school, and in the hop-gardens. (It must also be remembered that Tongham is continuous with Ash, and in free communication with it.) School influence in propagation of the disease was suggested in the consideration that the "first attacks" and majority of attacks in individual families were attendants at Tongham school; and that attacked children were attending school up to date of attack. Further, there is evidence that prior to the epidemic prevalence of the disease in the place, several children were noticed to have been wearing red flannel around their throats.* Also, besides the suggestion of the infection of the first fatal Tongham case from contact with other at Ash Street School, there were indications of direct and of mediate infection of other Tongham children at the periods of re-opening of this Ash Street school by attendance thereat, and mixing with other children there. Escapes from Diphtheria seemed to owe their immunity either to the influence of age (there having been few attacks under 3 or over 13), in some cases to a vague previous attack, this being usually termed a "bad cold," or to the care of mothers to prevent visiting of their children at infected houses.

A few adults were attacked, but all mildly. The total number of cases of throat-illness in Tongham during 1884 was between 40 and 50, which would give a mortality of about 16 per cent. of attacks. Fatality of the disease seems to have been connected not only with age, but

* The condition of the Tongham School itself does not preclude the idea of its having helped *per se* to foster the disease. The ventilation and cubic space are inadequate. (A room with very little cross-ventilation afforded only 70 cubic feet per head to an average attendance of 77 scholars.) Further, the school cesspit-privy was foul, open, filled with liquid material, sunk below ground, and situate only a few yards from a well, the water of which is foul and turbid.

with season also, seeing that there was an absence of deaths during the period May 18th to July 25th, although numerous cases of throat-illness were rife. Further, of the 8 deaths 7 occurred in the single month July 25th to August 25th, although several non-fatal cases were recognised after August.

The conclusion as to Tongham Diphtheria in 1884 is, therefore, that it was derived from Ash, and kept up both by relation with this place, and also by personal communication of one and another kind within its own boundaries, assisted by school attendance and by the complete absence of any isolation of the sick.

The only fatal case of throat-illness recorded in Seale proper was that of a child (æt. 11) who died of "Croup" on January 11th, 1885. There was a history of free visiting with Tongham at a time when several cases of throat affection were known to exist there; the child had been ill a long time before death, which resulted from syncope during convalescence.

No means for checking the epidemic were taken in Tongham beyond closing the schools from July 21st to November 24th. No disinfection of dwellings was performed, and no isolation of the sick carried out. The futility of the bare proceeding of school closure is shown in the number of deaths which continued to occur after it was effected.

(c.) *Frimley.*

This populous parish, containing more than 4,000 inhabitants, is situate north of both Aldershot and Farnborough, at the extreme north-west point of Surrey. It is placed upon the Middle and Upper Bagshot Sands, and a bed of Thames Gravel also exists in some parts of the parish. Pine-trees and furze flourish in great abundance, and the country is well watered.

Sanitary circumstances of Frimley proper.—With the exception of a few residential mansions, occupied chiefly by retired professional and military people, thatched and stuccoed cottages exist throughout, a few new ones made of brick being found in places. Over-crowding does not as a rule exist. *Excrement* is disposed mostly in cesspit-privies, though earth-closets are in use in some cases. These privy cesspits are rudely covered, usually bricked, but rarely cemented or ventilated. *Refuse* is thrown on the ground, or made into heaps. A few better-class houses have ashpits. *Water* is supplied from both public and private wells, which are ordinarily shallow dip-wells. In addition, open roadside ditches and watercourses, exposed to pollution from privies, are utilized both for drinking and washing purposes. *Drainage.*—No proper system of sewerage exists; such partial house drainage as exists here and there is imperfect and inefficient. The main street is provided with a short run of highway drain receiving storm and rain-water from roadside gullies, its contents eventually reaching open watercourses. Much water lies about in back yards, and the flooring and foundations of houses are not uncommonly damp.

Diphtheria prevalence.—Including fatal throat affections, probably diphtheritic, one death occurred in Frimley proper in 1882, five in 1884, and four in the first quarter of 1885. The 1882 case was that of an inmate of the Royal Albert Orphan Asylum, æt. 14, who died on February 8th of "Laryngitis." Five days before this, a case of fatal "Croup" occurred in York Town, which is the nearest centre of population to the Asylum, and in frequent relation with it. The five 1884 deaths were all comprised in the period December 8th to 26th, and affected four families. (One of them was certified as "Cynanche tonsillaris," but a second death in the same family shortly afterwards being termed Diphtheria makes it all but certain that the first was of like nature.) Their *ages* were respectively, three, four (2), eight, and nine years. The four 1885 deaths, which were in three families, occurred between the 3rd and 12th March, and were aged respectively four, five, and seven (2) years. On seeking the origin of the Diphtheria of Frimley proper in 1884, I was informed by the schoolmaster of Frimley School that a lad named Hursey, living in Mitchett Road, did not return to school when it re-opened at the end of September, owing to his being laid up with Diphtheria. On inquiring into the case, I found that the boy (whose age was eight years) was attacked with Diphtheria at the end of September, just after the hop-picking, and before school re-opened, that he accompanied his mother during her hop-picking work in certain of the gardens near Aldershot, and there played with boys like himself, accompanying their hop-picking mothers from Aldershot. He was particularly friendly with an Aldershot boy named Kercher, who, it appears, died of Diphtheria on September 23rd at Stone Street, Aldershot. Hursey's was the first recognised case in Frimley proper, and during October and November numerous

non-fatal, and in many instances slight and unsuspected cases of diphtheritic sore throat are known to have been present, some of them in adults. The next to be attacked by definite Diphtheria was a child named West, attending the Frimley School, who had come into relation there with another child from a house where suspicious sore throats existed. West seems to have infected directly at school a girl named Finch, and the latter succumbed two days earlier than West herself. The disease was now established in Frimley, and school influence may be looked upon as having been the chief means of its further dissemination. This conclusion is suggested by the following considerations:—(1) all the fatal cases attended school; (2) the first attacked in families were school attendants; (3) attacked children attended school up to the day of attack, or within a short period of it, and in a few cases were taken ill whilst at school. Mediate as well as direct infection seems to have operated at this school by the mingling of the susceptible with others from infected houses who were themselves unattacked.* There were no deaths in Frimley proper between December 26th, 1884, and March 3rd, 1885, but "bad colds" and sore throats were heard of as occurring in January and February 1885, and may therefore be considered as links between fatal Diphtheria of the two years. The same view as to the potency of school influence in disseminating the disease may be taken for 1885 as for 1884, and for similar reasons.

To sum up, Diphtheria was introduced into Frimley proper by communication with Aldershot, and largely spread by the influence of school assemblage, whilst being quite uncontrolled by any isolation.

As regards measures instituted by the Authority for controlling the epidemic, the school was closed from December 15th, 1884, to January 19th, 1885, and again on March 6th. These closures were evidently on each occasion dictated by the occurrence of fatal cases among school attendants. At the date of my visit they still remained closed; and the Medical Officer of Health having on April 10th requested my opinion as to the advisability of their continuing so still longer, I suggested that they should not be opened until no more cases of throat-illness were heard of. It is, indeed, probable that they were re-opened too soon in 1885, as the disease continued to make headway during January and February, and to re-appear fatally in March. Energetic disinfection of houses with sulphur and carbolic powder is practised by Mr. Drake, the Sanitary Inspector. No hospital provision of any kind has been made locally, or is available elsewhere, for Frimley proper. As notification of infectious disease is not adopted in the district, the sanitary officials were not apprised of the case Hursey by the York Town practitioner who attended him, and hence no suspicion of the introduction of Diphtheria from Aldershot had been entertained.

Here, again, fatality seemed to be related to season; for, although cases existed in October and November, none were fatal until December; and, similarly, January and February were non-fatal months compared with March. But this might also have been a sequence of fatality after wide-spread prevalence, apart from season.

The adjacent towns of *Camberley* and *York Town*, both comprised within the parish of Frimley, may be now taken together, since they are practically one place, and almost identical with each other in character.

Sanitary circumstances.—A large part of Camberley and York Town is occupied by private houses of the better classes, the military element being strongly represented, owing to the proximity of the Staff and Sandhurst Colleges. A considerable artisan population exists, which inhabits clean, well-built, and amply ventilated houses. *Excrement* is at present disposed in cesspits, most of which are bricked, and some few cemented; but earthenware pan-closets are being largely adopted in better-class houses since the main drainage scheme has been carried out. *Refuse* disposal varies according to the class of house, ash-pits being used amongst the gentry, and ash-heaps amongst the poorer people. *Water-supply.*—There is no general public service of water, wells being relied upon solely. These are both deep and shallow, but the former predominate in York Town, and the latter in Camberley. They are mostly brick-lined, and their depth varies from 10 to 35 feet. The coverings of the shallow wells are often in a very dilapidated state, and abundant opportunity is thus given for the entrance of surface impurities. *Drainage.*—A main drainage scheme has been recently completed throughout York Town and Camberley, and the connections of houses with sewers are stated to be all but finished. The whole of the district, except the low-lying part adjacent to the Berkshire boundary, is included in the scheme. Stoneware pipes, of diameters increasing from 6 to 12 inches in York Town, and from 6 to 9 inches in

* Frimley School is roomy, well ventilated, and well lighted. Excellent trough earth-closets are in use, replacing the suspicious cesspit-privies which existed during the main incidence of Diphtheria.

Camberley, are laid at suitable gradients. Flushing is provided by tanks, one for York Town and one for Camberley, which, however, cannot be expected to act efficiently until a more adequate water supply is obtained. Ventilation is carried out by manholes and lampholes, which are situated about every 100 yards in the York Town system, and about every 130 yards in that of Camberley. Disconnection of house-drains from main sewers is not yet in general vogue, though the former are sometimes ventilated by stack pipes between the house and the sewer. Soil-pipe ventilation is being gradually introduced. Bath and sink waste-pipes commonly open outside over trapped gullies, but the inefficient bell-trap is still in use at internal sink-openings.

Diphtheria prevalence.—Three deaths were registered from “Croup” in York Town, respectively in December 1881, February 1882, and March 1883, the certificates being signed by the same practitioner. The several ages were 7, 4, and 1 years, and the description of the symptoms elicited on enquiry makes it probable that they were essentially diphtheritic in nature. Two of them were in better-class houses, and the third in a cottage which was exposed to nuisance from an offensive ditch receiving slops and house refuse. No relation with antecedent Diphtheria in adjacent parts was made out. Camberley has contributed only one death from throat-illness, a boy (æet. 4) having died from “Croup” in September 1882, in a well-circumstanced artisan house. In this case, also, no relation with previous non-fatal cases, or with Diphtheria in other districts, was discovered.

In common with the whole Rural District, no hospital provision or notification of disease exists in York Town and Camberley.

The whole of Frimley parish was invested in January 1885 with urban powers under sections 26, 44, 157, and 158 of the Public Health Act (1875), and byelaws are now being drawn up.

(d) *Frensham.*

This is a large scattered parish, of 8,807 acres and 2,100 inhabitants, situate south of Farnham, and between that town and Hind Head. It contains a considerable proportion of common-land, covered with furze and heather, and geologically is upon Folkestone Sand.

Sanitary circumstances.—The residences of gentry are interspersed amongst scattered groups of old cottage property in a large part of the parish, though some parts are exclusively inhabited by poor cottagers. *Excrement* is received in rude privy-pits, which are often mere openings made in the sandy soil of the district. *Refuse* is thrown on to the gardens, or retained in heaps. *Water* is supplied almost entirely from shallow dip-wells, often in close proximity to foul unemptied privies, though here and there a deep well is found. *Drainage.*—Slops are either thrown by hand on to the ground, or find their way into watercourses and ditches.

Diphtheria prevalence.—Isolated cases have from time to time occurred in Frensham. In July 1882 the death of an infant was recorded from “(a) Membranous Pharyngitis and Laryngitis; (b) infective Bronchitis;” this appears to have been intended as a synonym for Diphtheria. In August 1883 a death from Diphtheria was recorded, which seems to have derived infection from the Bourne, a district near Farnham, at which the disease was very prevalent at the time. Two fatal cases were registered from Diphtheria in 1884,—one in February, and the other in June. The former seemed to have owed his attack to communication with a case of throat-illness in the same house, which had been in free relation with Diphtheria at Farnham; and the latter may also have derived infection from the same locality, but in a mediate manner, since her father (a coachman) was in the habit of driving constantly into Farnham at a time when much Diphtheria existed there.

(e) *Dockenfield.*

This small parish, of 578 acres and 210 inhabitants, is placed rather to the north-west of Frensham, close to that parish, and on the borders of Hampshire. Its geological character resembles that of Frensham.

Sanitary circumstances.—The cottages here are most of them small, badly constructed and ventilated. *Excrement* and *Refuse* disposal is by rude privy-pits, and ash-heaps respectively. *Water-supply* is very deficient, rain-water being caught in tubs, and drunk unfiltered; surface springs, too, are largely used. These natural sources have been supplemented by the sinking of a well, 100 feet deep and steined with brick. It was presented to the parish, not by the Sanitary Authority, but by private benevolence in 1881.

No Diphtheria is recorded as having occurred in Dockenfield of late years.

(f) *Waverley.*

This small parish (or, more properly, "extra-parochial ville"), of 542 acres and 40 inhabitants, is situated east of Farnham, and north of Frensham, and a few miles from each place. It contains some private residences, and a few scattered cottages, and is upon Folkestone Sand, here overgrown by furze. The sanitary condition of the cottages is much the same as in the extra-urban parts of Farnham parish, to be presently described. No Diphtheria has occurred in Waverley recently.

(g) *Extra-urban parts of Farnham Parish.*

This part of Farnham Parish has recently been diminished in area by the inclusion of a part of it within the Farnham Urban Sanitary District. It takes in the whole country around the Farnham Urban District bounded northward by Hungry Hill, to the south by Frensham, to the east by Puttenham Common, and to the west by the county division near Dippenhall. Much waste land, covered by heather and furze, exists here, and many streamlets and ponds. Geologically, this portion of the Rural District displays great variety,—Folkestone Sand, Chalk, and London Clay being all met within its various parts, from south-east to north-west.

Sanitary circumstances.—Dwellings are mostly cottages of various construction, though groups of modern brick built artisans' dwellings exist in some parts, e.g. at Heath End and Hale. *Excrement disposal* is by privy-pits, which are sometimes bricked, but generally mere open holes in the ground, rudely covered by earth, or wooden boards. Private mansions, as also some few terraces occupied by retired professional people, have water-closets emptying into cesspools. *Refuse disposal.*—Ashes are commonly applied to land, but also disposed in heaps along with vegetable refuse. Ash-pits are to be met with on the premises of better-class people. *Water* is obtained throughout the greater part of this district from shallow wells, which are loosely lined with bricks, and are open to contamination from surface washings, and privy percolations. The large Bourne district is very badly off for water, the inhabitants depending almost entirely upon rain-fall, which is stored in underground tanks. At Runfold, too, some of the houses have no other supply but rain-water, which is caught in tubs and used for drinking; even the few deep wells here constantly run dry. Wrecclesham is supplied with upland surface water flowing into an underground tank; it has also a deep well, the property of a small private company consisting of the vicar and churchwardens. A small charge made for this water goes towards repairing the pumping apparatus used in connection with it. *Drainage.*—The cellars of some of the houses are damp, and water lies about in them. Slops are usually thrown on the ground, or are received in small cesspits, which are not usually bricked or covered, and frequently overflow into the adjacent fields. At Badshot Lea, house slops are directed either into trenches which lead to roadside ditches, or to a system of bricked cesspits which overflow one into another, and finally into becks tributary to the river Blackwater. The pollution of these becks is a source of frequent complaint from owners of the land traversed by them before they join the Blackwater. Rain-spouts in most places are directed into tanks or tubs, but in a few empty directly on the ground.

Accommodation for hop-pickers appears to be defective. The construction of the "barracks" is faulty, their ventilation and cubic space are inadequate, and closet requirements are lamentably insufficient.

Diphtheria prevalence.—It has been seen in Table (B.) that a death from Diphtheria occurred in the Farnham division of the Farnham Rural Sanitary District, during the first quarter of 1875. This was a child (æ. 5) at Wrecclesham, concerning whom, from the lapse of time, no information can be procured. Two more were recorded in the second quarter of 1875, in children aged respectively 4 and 2 years. But in both these the Diphtheria was evidently not at first recognized, for the certificates read as follows:—In the first case, "Ulcerative Tonsillitis, five days; Diphtheria, four hours;" And in the second case, "Cynanche tonsillaris, four days; Diphtheria, one day." They were members of the same family, residing at Sandrock Cottage, Farnham, and died in April 1875. In August 1876, another death (a child æ. 4) took place at Wrecclesham, and, in addition, a death was certified as "Croup," in the same month, and at the same place. In the third quarter of 1877, three deaths were registered from Diphtheria, all in children under 10 years, of which one was at Beavers' Kilns, Farnham. In April 1878 the death of a child (æ. 5) at the Grange, Farnham, was registered as "Diphtheria and Croup, three days;" in September of the same

year, an infant of eight months died of "Croup" at Coxbridge, Farnham. Concerning these isolated cases of Diphtheria and "Croup" occurring in the extra-urban parts of Farnham from 1875 to 1878, no information has been procurable, though one case was that of a hopper's child coming from Berkshire, who may therefore have contracted the disease outside the district. No further deaths from Diphtheria were registered until September 1882, though in 1881 there were three deaths from "Croup," and one from "Diphtheritic Croup." (In 1882, also, another "Croup" death took place.) The first of these "Croup" cases occurred in September 1881, at Weydon Hill, in the person of a hop-picker's child, who was taken ill just after the hop-picking, and may have been in relation with other imported cases in the hop-fields. The next took place in November at the Bourne, between which and Weydon Hill free relation exists; intermediate non-fatal cases of throat affection may well have existed unrecognised during the interval between these deaths. The two remaining deaths in 1881 took place at Boundstone in November, closely following the Bourne death, free family and other relationship existing between these two places. The *age* at death of these four cases was respectively 4, 4, 3, and 5 years. The 1882 "Croup" death was that of an infant living at Boundstone, and took place in August. According to the Monthly Reports of the Medical Officer of Health for Farnham Urban Sanitary District, there were a great many diphtheritic sore throats in Farnham during June and July 1882; and, seeing the constant communication there is between Farnham and Boundstone, infection may well have been transmitted from the former place. The recorded Diphtheria death in September 1882 was at Moor Park, an isolated hamlet near Farnham, and in free relation with it.

Between May 19th, 1883, and January 5th, 1884, 12 Diphtheria deaths occurred in the extra-urban parts of Farnham, of which eight were in the Bourne, two at Hale, one at Crooksbury, and one at Old Park. Their *ages* ranged from 3 to 13 years. The first Bourne case was infected at Farnham by visiting, previous to attack, the fair at that town in May 1883, at a time when many cases of sore throat existed. The disease was spread in the Bourne by personal communication, and by school attendance. The potency of the latter was suggested by the fact that the majority of the sufferers were of school age, and that the first attacked in families were attendants at school. Further, relation of the later attacked with those earlier affected could in some instances have taken place only at school.*

The two Hale deaths were on November 18th and 25th respectively, but before and after these dates non-fatal cases existed in the place in great numbers; and the disease is not even yet extinct. Hale is in free communication with both Farnham and Aldershot, between which towns it lies. Numerous cases existed in both these towns during the autumn of 1883, so that Hale Diphtheria may be assumed to have had its origin from relation with Farnham, or Aldershot, or both. Spread was made easy by personal intercourse, and the Bishop's school here had undoubted influence in keeping the disease going. This was shown in that most of the sufferers were school-goers, that those first taken with the disease in families of children were usually attendants at school, and that the schoolmaster's children themselves were attacked.†

The death at Crooksbury was on November 15th, 1883, at an isolated cottage; the infection was most probably received on November 10th at Farnham, the child having visited the November fair at that town on that particular day. The Old Park death was on December 26th, 1883; these people had left, and I was unable to follow the case further, but it was probably related to Farnham Urban Diphtheria. After January 5th, 1884, no further deaths were recorded until October 13th in the same year, when a girl (æet. 3) died at Heath End, Farnham, of "Croup." This case was related to Aldershot, for the child's mother was in the frequent habit of taking the child to this town, when shopping and the like. (It has been seen, under the Aldershot heading, that numerous deaths and cases were taking place at this time, and that tradespeople especially suffered.)

In common with the rest of the Farnham Rural District, the extra-urban parts of Farnham Parish have no hospital accommodation, no systematic disinfection is

* Stout children were noticed at the Bourne to succumb more frequently and more rapidly than thin ones. In some recovered cases, loss of voice and difficulty of swallowing occurred; in others, weakness of the lower extremities.

† No closure of the Bishop's School was ordered by the Sanitary Authority. The school itself appears to be well ventilated and constructed. The cesspits attached to the privies, are, however, not ventilated, and but seldom emptied.

practised, and the Medical Officer of Health obtains no notification of infectious disease from medical practitioners.

Sanitary administration of the Farnham Rural District.—The guardians of the Farnham Union act as the Rural Sanitary Authority, the clerk to the Guardians, Mr. Whiteley, receiving 40*l.* a year for his services. Mr. J. A. Lorimer is Medical Officer of Health, at a remuneration of 40*l.* per annum. There are four Sanitary Inspectors. Mr. Baker is Inspector for Frensham, receiving 7*l.* per annum; Mr. Burningham is Inspector for the extra-urban portion of Farnham, at a salary of 25*l.* a year; Mr. Drake undertakes the duties of sanitary inspection for Frimley at 20*l.* a year; and Mr. Stedman those of Ash and Seale for 10*l.* It is needless to say that all the Sanitary Inspectors follow other employment. The Rural Sanitary Authority does not appear to be alive to its important health functions, no steps of any moment having been taken to improve the hygienic condition of the large District committed to its charge, and no means adopted to check the serious epidemic of Diphtheria which has ravaged it. The Sanitary Officials, including the Health Officer and some of the Sanitary Inspectors, have repeatedly drawn the attention of the Rural Sanitary Authority to gross nuisances and dangers to health, but their representations have been disregarded. The salaries, too, of the officers employed by the Rural Sanitary Authority are manifestly inadequate, particularly that of Mr. Lorimer, who is expected to perform the duties of Medical Officer of Health of a very large District for the sum of 40*l.* per annum.

R. D. R. SWEETING.

April 20th, 1885.

RECOMMENDATIONS.

Aldershot Urban Sanitary District.

- (1.) Skilled engineering advice should be sought with respect to improvement of the ventilation and flushing of the present sewerage system.
- (2.) The Sanitary Authority should see to the extension of the public water supply (under section 62 of the Public Health Act of 1875). All shallow wells exposed to the risk of fœcal pollution should be disused.
- (3.) Disconnection of house drains from the sewers should be more generally carried out. Sink and waste pipes should in all cases be cut off from direct communication with the drain, and made to open outside into channels leading to trapped gullies.
- (4.) Means of flushing water-closets otherwise than by hand is much needed. The provision of service boxes in connection with the closets is desirable.
- (5.) The position and construction of ash-pits should be improved. They should not be placed near houses, and should be properly covered, cemented, and ventilated.
- (6.) A hospital for the reception of infectious cases should be at once provided for Aldershot (under section 131 of the Public Health Act of 1875). Removal to hospital should be effected when necessary under section 124 of the same Act, but intimation should be given that no pauperization is entailed, and payment (under section 132) should not be pressed in all cases.
- (7.) Adequate disinfection of houses and appurtenances should be carried out by the Sanitary Authority. A disinfecting chamber and a mortuary should be erected.
- (8.) The present bye-laws, more especially those relating to nuisances and to new streets and buildings, should be revised; or in their stead new ones, based on the model series of the Local Government Board, be adopted.

Farnham Urban Sanitary District.

- (1.) As soon as the new drainage scheme is completed, and the house connections established, existing cesspools should be done away with. Waterclosets connected with the sewers should be adopted, and the soil-pipes connected with them be adequately ventilated. Disconnection of house-drains from sewers should be made.
- (2.) The public water supply should be extended to other parts of the district (under section 62 of the Public Health Act of 1875), and its quantity might be advantageously increased. The propriety of taking the Farnham Water Company's works on lease for a term of years, with a view to the enlargement of their capacity, deserves the consideration of the Sanitary Authority. All existing shallow wells should be abolished.

(3.) Sink and waste-pipes should empty over external channels leading to trapped gullies in connection with the drains.

(4.) Ashpits should be properly constructed with reference to covering, ventilation, and cementing. In no cases should they be placed close to houses.

(5.) A hospital for infectious diseases should be at once established. If desired, combination for this purpose with the Farnham Rural Sanitary District, under sections 131 and 279 of the Public Health Act of 1875, might be effected. For details as to management and construction, the Report on Hospitals, in the Supplement by the Medical Officer to the Tenth Annual Report of the Local Government Board (and issued as a Parliamentary paper, C. 3290 of 1882), should be consulted.

(6.) Thorough disinfection of rooms, beds, and linen should be practised after the occurrence of infectious disease. A disinfecting chamber might with advantage be provided by the Authority.

(7.) The present obsolete bye-laws should be given up, and a new series adopted, on the basis of those recommended by the Local Government Board. Existing ones relating to new buildings, nuisances, and slaughter-houses are especially in need of revision.

Farnham Rural Sanitary District.

(1.) The Authority should consider the necessity of abolishing privy-pits, and of substituting for them some other more wholesome mode of excrement disposal. The Official Report on "Certain means for preventing excrement nuisances in towns and villages" would supply required details.

(2.) The Authority should consider the question of either introducing a public water service into the District, or of sinking deep wells (under section 51 of the Public Health Act of 1875), preparatory to the abolition of shallow wells, and underground rain-water cisterns.

(3.) Existing cesspools should be properly cemented, ventilated, and covered. The Authority should arrange for their regular emptying.

(4.) In places where proper drainage exists, sink and other waste pipes should be made to empty externally over channels leading to trapped gullies.

(5.) Properly constructed ashpits should be provided, and all ash-holes done away with. Frequent and regular clearance of house refuse should be instituted.

(6.) Hospital accommodation for infectious diseases should be furnished without delay. If desired, combination with the Farnham Urban Sanitary Authority might be effected under sections 131 and 279 of the Public Health Act of 1875. For details of hospital construction and management, the Report on Hospitals, in the Supplement by the Medical Officer to the Tenth Annual Report of the Local Government Board (and issued as a Parliamentary paper, C. 3290 of 1882), might be with advantage consulted.

(7.) Adequate disinfection of houses and of bedding and clothing, after the occurrence of infectious disease, should be systematically and vigorously practised. For this purpose, a disinfecting chamber would be of great utility.

(8.) It would seem desirable that the nuisance inspection of the whole Rural District should be in the hands of one responsible Inspector, who should be paid an adequate salary, and debarred from other work. Having regard to the large area of the District, the Sanitary Authority might consider it advisable to provide the Nuisance Inspector with the assistance of one or more Sub-inspectors.

(9.) The Authority should consider the question of applying to the Local Government Board for urban powers in other parts of the District besides Frimley. Bye-laws under sections 44, 157, and 158 of the Public Health Act, 1875, should be drawn up. Further, hop-pickers' bye-laws should be made, under section 314 of the same Act.

*Cambridge
The Local
Sanitary
Authority
Cambridge & Farnham
in the District
of the Farnham
Sanitary
District*