Dr. R.J. Reece's report to the Local Government Board on the general sanitary circumstances and administration of the urban district of Aldershot, with special reference to the prevalence of fatal diphtheria therein.

OFFICIAL COPY.

Dr. R. J. Reece's Report to the Local Government Board on the General Sanitary Circumstances and Administration of the Urban District of Aldershot, with special reference to the prevalence of fatal Diphtheria therein.

W. H. Power,
Assistant Medical Officer,
31st August, 1899.

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A. Preliminary.

1. *Reason for inspection.*—In view of the continued fatal prevalence of diphtheria in the Aldershot Urban District, shown in successive Quarterly Returns of the Registrar General, I was instructed by the Board to make inquiry into the circumstances in which the disease has prevailed.

The inter-relation of the Town and the Camp is such that the Board duly notified the fact of my inspection to the War Department, and requested that the military authorities should be instructed to furnish me with such assistance as I required. This assistance was cordially given.

2. *Previous inspections in consequence of Diphtheria.*—The district has twice previously been inspected and reported on by the Board's Inspectors in consequence of the prevalence of this disease,—in 1885 by Dr. Sweeting, who reported on the Registration District of Farnham, in a Sub-District of which the Urban District of Aldershot was included, and in 1887 by Dr. George Turner.

3. *The Aldershot Registration Sub-District.*—Since the reports of the inspections referred to were written, the Registration District of Farnham, which consisted of the Registration Sub-Districts of Frimley and Farnham, has been divided into three Sub-Districts, Aldershot, Frimley, and Farnham. This re-arrangement of the districts took place in 1897. The Registration Sub-District of Aldershot is co-terminous with the Urban District of Aldershot and with the civil parish of that name.

The Aldershot Urban District, although in the county of Surrey for registration purposes, is at the north-east corner of Hampshire, and is within the jurisdiction of the County Council of Southampton.

4. *Geology.*—Towards the south of the district the town stands on London Clay, and to the north, on the Lower, Middle, and Upper Bagshot Sand. The eastern portion of the southern boundary of the district, and the whole of the eastern boundary is formed by the river Blackwater, along the banks of which stream the soil is alluvial.

5. *Area and Population.*—Comprised within the boundaries of the Urban District of Aldershot is the whole of that portion of the Aldershot Military Camp, known as the South Camp, and also a portion of the North Camp* which, however, is practically uninhabited ; it has no barracks built on it, therefore no population.

The area of the Urban District is 4,178 acres, divided thus—

	Acres.
Camp	2,746
Town	1,432
Total	4,178

The town of Aldershot sprang into existence in consequence of the establishment of the military camp in the early fifties. Of recent years, owing to the action of the War Department in abolishing the old wooden huts of the camp and replacing them by permanent buildings of brick, the building trade of the town has been in a flourishing condition ; many fresh houses have been erected, and many are yet building. By the courtesy of the Registrar-General

* The Military Camp of Aldershot is divided into the South Camp and the North Camp. The North Camp borders on the village of Farnborough, and has comparatively but little inter-communication with the town of Aldershot, which is a mile distant and approached over a hill.

the following table has been prepared from the records of his Office. It gives the number of inhabited houses in the urban district, and the population at the five census periods 1851, 1861, 1871, 1881, and 1891 :—

	1851.	1861.	1871.	1881.	1891.
Houses inhabited	159	763	1,175	1,570	2,182
„ uninhabited	4	49	90	199	88
„ building	—	11	21	9	28
Population in Town—Total ...	875	4,977	7,523	9,727	12,641
Males ...	438	2,593	3,409	4,584	6,240
Females...	437	2,384	4,114	5,143	6,401
Population in South Camp ...	—	11,743	14,159	10,428	12,954
Military... ...	—	8,965	10,067	7,280	9,992
Other Males ...	—	844	1,299	983	931
Females... ...	—	1,934	2,793	2,165	2,031

These figures show the great increase of population in the district during the forty years to which they refer, and there is evidence that so far as the town is concerned the increase continues. I learn through the Rate Collector that at the present time the number of assessments in the district is 3,087 ; deducting from these figures 234 as being the number of lock-up shops, stables, workshops, &c., the number of inhabited houses would be 2,853.

It is no easy matter to estimate the population of the town with any degree of accuracy. From the table given above it can be deduced that in 1861 the average number of persons in each house was 6·5, and in 1871 it was 6·4. In 1881 the number had fallen to 6·2 and in 1891 to 5·8. Taking the latter rate of persons per house, the civil population of the district at the present time would be about 16,500 persons.*

I learn that the average population of the South Camp during 1898 was :—

Men	11,299
Women	1,007
Children	1,588
Total	13,894

The number of persons resident in the Aldershot Urban District, however, is far from stationary. At Easter and Whitsuntide, and during the summer, the numbers in the Camp are swelled by Militia and Volunteer Regiments coming into the Camp for longer or shorter periods, and by the addition of various bodies of troops drafted in for special instruction. With the advent of these the number of inhabitants in the town is increased by the wives and children of certain of the soldiers, and by the usual camp followers. Again, Aldershot borders on a hop country, and at the hop picking season a certain number of the hop pickers take up their residence in the town of Aldershot.

6. *Occupation of the inhabitants.*—The chief industries of the district are shop-keeping, on larger or smaller scale, and the letting of lodgings. Lodgings range from whole houses let to officers, their wives and families, to single rooms let to the soldier and his wife. There are neither resident gentry nor manufactories. The town of Aldershot exists by reason of the Camp.

* At the census of 1891, the number of inhabited houses in the Civil Parish of Aldershot was 2,182, and the number of families or separate occupiers was 3,069. This means that certain of the houses are let out room by room.

7. *Artificial division into "Town" and "Camp."*—It will be convenient to consider the district for purposes of this report in its two great divisions: "the Town," occupied by the civil population, and "the Camp," which is the property of the War Department.

The inhabited part of the North Camp is in the Registration Sub-District of Farnborough. The following population is recorded at the census periods for the North Camp:—

———	1861.	1871.	1881.	1891.
Population in North Camp	4,671	4,260	3,538	3,979
Males	4,150	3,517	3,060	3,401
Females	521	743	478	578

B.—"The Town" and its General Sanitary Circumstances.

8. *The Water Supply* for the Urban District is in the hands of a private Company, "The Aldershot Gas and Water Company."

I am indebted to Mr. A. J. Wilson, the Chairman of the Company, with which he has been closely connected for some 25 years, for much of the following information.

At one time, some 30 years ago, the Company procured their supply of water from the gravel strata at the southern part of the district, but owing to the increase of the Town, and, to a certain extent, the difficulty of ensuring the gathering ground from pollution, borings have been sunk through the London Clay to the Chalk, and I am informed that no water is now distributed by the Company to the public which is not derived from the Chalk: the water from the Bagshot Sand being only used for condensing or cooling purposes in connexion with the engines. The borings are sunk at the extreme southern boundary of the Aldershot Urban District, and there are nine boreholes carried through the clay to a depth of 220 to 300 feet from the surface, eight of which are connected together to facilitate pumping. The pumps are placed 38 feet below the surface of the ground, and the water rises to within 22 feet of the surface. It is said that even after heavy pumping the water has never been known to sink below 38 feet from the surface.

There are three sets of gas engines, each having a treble set of pumps, and each set of pumps is of 25 horse power nominal, and four sets of steam engines of a total 42-horse power nominal, contained in two separate buildings.

The pumps in each building are capable of throwing 50,000 gallons per hour. The gas engine plant is almost entirely used under ordinary circumstances, and one pump is always kept going night and day, two or three additional pumps being brought into use during the daytime as required.

The Company also supply water to the military camp as required, and on 16th February last 455,000 gallons were pumped to the camp, and 386,000 gallons to the town, making a total of 841,000 gallons supplied in 24 hours. This amount by no means represents the maximum output of the Company, as their books show that over 1,000,000 gallons were supplied one day last summer.

There is ample margin of pumping power: provided such an amount of water could be obtained, it is possible that the engines could raise twice as much water as has yet been required in any 24 hours.

It is estimated that an average quantity of 25 gallons per head is consumed in the town of Aldershot. The Company have 2,705 houses on their books, and thus there must be some 148 houses where the water supply is derived from wells or surface springs, or which have no water supply.

The water is pumped from the wells direct to two service reservoirs at "Reservoir Hill," formerly called "Anger Copse." This is the highest point in the town, and the water is delivered thence by gravitation. The

supply is constant. No instance of a cistern for water supply for domestic purposes, other than the flushing cisterns of water-closets, came under notice.

The greater proportion of the houses have the water supplied inside the buildings, but there are several rows of cottages to which water is only laid on to a standpipe in the yard.

The water is hard, about 16 Clark's scale, but is reported to be of great purity.

Local Wells.—The number of houses supplied from wells is becoming insignificant. The majority of the wells are presumably to be found in the outskirts of the town at farm-houses, &c., and the water from these wells is often used for dairy purposes. Nevertheless wells are, as is mentioned below, to be found in the populous parts. Such private wells as came under inspection are all constructed after the same principle, and differed only in depth and in the degree to which they are liable to pollution. They are dry-steined surface wells. The depth of the well varies with its position in the district. On the high ground, at Queen's Road, one well was observed which was said to be 36 feet deep, and where a windlass was used to lower the pail by an iron chain, the water apparently standing some 25 feet to 30 feet from the surface. From this to wells a few feet deep, where the water stood at the level of the surface of the ground, all varieties were observed. Most of them were imperfectly protected against surface drainage, the covers nearly always being dilapidated wooden structures, and often the well was so surrounded with organically polluted soil as to render the water almost certainly liable to gross pollution. Nevertheless, one well a few feet deep was observed where the water stood within a few inches of the ground level; within some 20 or 30 feet and situated on slightly higher ground than this well was an undrained and filthy farmyard, where manure thrown from the cowsheds was allowed to collect: a sample of the water from this well is said to have been submitted for chemical analysis and not to have been condemned. From a study of the surroundings of this well it is almost impossible to conceive that the well water could escape pollution.

One house* was observed where the water supply was derived from a hole in the ground; immediately adjoining this hole, separated only by a fence, and on higher ground, was on one side a highly manured garden, and on another side ground which by use had become a sort of refuse tip. The houses in the immediate neighbourhood are not connected to the main sewerage system, and the excrement and slop drainage is disposed of on the land adjoining the houses.

For some time past the District Council have submitted samples of well water for analysis, and of the samples so submitted some eighty per cent. have been condemned, and the wells ordered to be closed by the Council. Still, although the order has been made by the Council, it is quite manifest that it has not always been observed, owing, perhaps, to the popular prejudice in favour of the well water.

In the most thickly populated part of the town one pump was seen, which is said to be connected with a surface well almost immediately below it. It stands in the roadway, the houses on one side of which are cottage property. The water from this pump was submitted for analysis, condemned, and the well closed by order of the Council. On the day of my visit a padlock and chain lay on the ground near the pump, from the spout of which water was trickling. There was nothing to prevent children from drinking this water.

9. *Sewerage.*—From the time that Aldershot began to be a town of importance, sewers have been laid down; but the Sanitary Authority and later the District Council would appear never to have succeeded in completing a satisfactory scheme of sewerage. From time to time the authority have applied to the Local Government Board for sanction to borrow money for additions to, or alterations

* Since this Report was written I have learnt this house has been closed as unfit for human habitation.

of, the existing sewers, and many local inquiries have been held by the Inspectors of the Engineering Department of the Board. Such loans have not always been raised when sanctioned; and it would appear that occasionally, when the work has been done, it has not been carried out in its entirety.

There is little doubt that some of the original sewers laid between 1850 and 1860, and perhaps even later, are merely puddled with clay at the joints of the pipes, and it is scarcely conceivable that such pipes do not leak.

There is no lack of fall in the system, taken as a whole, but the Authority have had constant trouble with the sewers, and some of them silt up. Parts of the localities not originally included in the sewer system have had to be sewered owing to the increase of buildings, and ejectors have been inserted to force the sewage from certain low-lying portions to the higher levels of the sewer system.

At the present time the District Council are fully alive to the defects of the sewer system, and are endeavouring to make good the deficiencies. A separate system of sewers for storm water to relieve the main sewers, and to lessen the quantity of liquid to be dealt with at the sewage farm, was commenced many years ago, has been from time to time added to and extended, and is not yet complete.

The system of storm water sewers takes the surface water from the roads, and the front roofs of houses; the back roof water passes, as also the rain water from the yards, to the ordinary sewers. These storm water sewers as a rule run parallel to the main sewers in the streets. There are still houses in the district whose cellars and basements are flooded during heavy rain.

The storm water sewers discharge by two main outfalls into the River Blackwater on the eastern boundary of the Urban District, the northern outfall being by Back Cutting Wood, near the Basingstoke Canal, and the southern outfall by Ash Bridge.

The sewers receiving the house drainage commence as stoneware pipes 8 inches and 9 inches in diameter; these converge to 12 and 15 inch sewers, until at the point where Victoria Road joins the High Street, the main sewer has a diameter of 18 inches. This calibre is maintained until Herrett Street is reached, from which point a cylindrical brick sewer 24 inches in diameter and some 1,350 feet long, takes the sewage to the sewage works.

Altogether there are some 14 miles of sewers in the district, without reckoning the surface drainage.

The majority of the sewers are laid at a considerable depth from the road surface.

Many of the original sewers were not laid in straight lines from point to point, but were carried in curves.

From time to time certain of the older sewers have been relaid on more modern methods, and man-hole inspection chambers have been added as thought fit. Some of the man-holes of the older system have catch-pits below the level of the sewers, evidently with the idea of stopping sand being carried to the lower portion of the sewerage system. These catch-pits stop the solid sewage matters as well as the sand, and they are ventilated to the roadway by gratings; they have often proved a nuisance by emitting disagreeable odours. The present Surveyor is endeavouring to rectify the construction of such man-holes, but much work in connexion with them yet remains to be done.

Ventilation.—The sewers were originally ventilated by gratings at the street level. These proving a nuisance, owing possibly to the solid nature of much of the sewage, due to the fact that many water-closets were hand-flushed or not flushed at all, they were either closed by the officers of the Council or blocked up by such of the neighbouring inhabitants as suffered most from them. To effect ventilation, some 19 ventilating shafts, 6 inches in diameter, were erected against buildings where permission could be obtained, and two were set up by the kerb of the pavement.

Many of the ventilating shafts after they emerge from the ground are not carried up straight, but often have curves or bends in their course, thus vitiating

to a great extent the object for which they were erected. One instance was observed where a rain water gutter of a house was discharged into the head of a public ventilating shaft. As may be readily imagined it has been found that 21 ventilating shafts are insufficient to ventilate the 14 miles of sewers, and recently the Urban Council have applied to the Board for sanction to borrow money to erect some fifty steel ventilating columns 30 feet high and 6 inches in diameter at the dead ends of sewers. After local inquiry by an Inspector of the Board's Engineering Department, this sanction was granted—24th November, 1898—but at the end of February in the present year the work had not been commenced.

Flushing.—The sewers are supposed to be self cleansing, but, as a matter of fact, there are certain sewers which do not fulfil this requirement. At West End there is a storage tank for rain water which is used to flush the sewers in that locality, and there are sewers in Church Street, Crimea Road, Little Wellington Street, North Lane, Malthouse Lane, Wellington Terrace, and the Brighton Road, which are flushed every alternate week in fine weather, by means of a hose pipe and water van. It would seem advisable that some automatic system of flushing should be supplied at the dead ends of the sewers.

10. *House drainage and excrement disposal.*—The house drains are said to be composed of glazed cylindrical earthenware pipes, 4 inches in diameter, in all recently erected buildings, but the older house drains vary in size. The 4 inch drains from two or more houses, are often joined into a common drain 6 inches in diameter, before passing to the main sewer. In most cases the house drains appear to be outside the houses, though from the way the ground has been built on, and the close aggregation of dwellings in places, many drains are of necessity carried through or under the buildings. In many even of the smaller houses, the sink is placed inside the house, but in the great bulk of these the sink pipe opens into the open air, over or near a gully.

Excrement disposal is effected principally by the water carriage system. There are but few privies, and these are for the most part situate in the outlying parts of the district, such as Eggars Hill, Boxalls Lane, the Dog Kennels, and Aldershot Stubbs.

In most of the better class dwellings there are at least two waterclosets to each house, one inside the building and one out; and an inside and outside water closet are to be found in smaller houses which have been recently erected, and, not unfrequently, there is a bath room associated with the inside water closet. Again, there are houses with only an inside water closet, but for by far the greater number, there is only an outside water closet. The number of water closets of all classes dependent on hand flushing for cleanliness, is variously reckoned at between 25 and 30 per cent. of the whole. The pattern of closet most in use is one or other variety of hopper; many pans are cracked, and a certain number neglected. Instances were observed where one water closet did duty for two or more houses, but such an arrangement is uncommon.

The soil pipes of the water closets are often unventilated, though it has been the custom of late to insist on the ventilation of the soil pipes when infectious disease has been notified in a house. Thus it comes about that the houses in which infectious disease has occurred, can to a great extent be recognised by the fact that the house drains have been ventilated. With the order to ventilate the drains, an order is also made to supply flushing apparatus to the water closet, and many of the old hand-flushed closets have disappeared in favour of a water closet supplied with a flushing tank. In the newly erected houses, and in all recent alterations, the soil pipe is ventilated by a shaft carried up straight, and of full bore; but this is the exception, rather than the rule, in the older houses, and also in cases where modification of the closet arrangements has not been made within the last three years.

The connexions of the house drains with the sewers is faulty in many cases, as it has been the practice in making such connexions, to cut a hole in the side of the sewer, and insert into it the spigot end of the drain pipe, the gap between the circumference of the hole cut, and the inserted pipe, being

filled in with cement. Such joints are defective in construction, and must of necessity nearly always leak, or allow entrance of ground water to the sewers. It is only within the last two years that the connexion has been made with a proper sewer eye and bend. Joints made on the older method still remain to an unknown number.

There are several localities in the district where the houses are unconnected with the sewer system, and some of these houses drain to cesspools, occasionally of a most primitive kind. The subject of dealing with these localities in the way of furnishing them with sewers, and the project also of dispensing with the present ejectors on the existing sewerage scheme, are at present occupying the attention of the Council. The construction of such new sewers, if properly carried out, cannot fail to be of great sanitary advantage to the district.

Only quite recently a certain common lodging house situated in that part of the town most thickly built over was found to have its drainage to cesspools in the yard. There appeared to be no overflow provided to these cesspools, and for many years the sewage matter therefore must have found its way into the surrounding soil.

11. The *sewage farm* of the town is situated at the south eastern part of the district near Ash Bridge. The river Blackwater borders the Eastern side of the sewage farm, and it is into this river that the effluent is discharged. At one time this farm was managed by contractors who were paid for their services ; at present it is worked by the District Council through a committee of which Mr. W. T. Robertson, J.P., is Chairman. There is a farm bailiff who receives a salary of 35*s*. per week.

The crude sewage is delivered at the farm to a pump well, whence it is raised to a small tank by two (duplicate) centrifugal pumps by engines worked by steam power. The sewage while flowing through the small tank is treated with Gobb's alumina, and passes then to the settling tanks. From the settling tanks part of the sewage is directed on to land for treatment by broad irrigation, for which purpose there are about 28 acres, and part passes to bacterial filters, recently erected by the Council, the effluent from which is passed over a small piece of land before joining the main effluent which discharges at the north eastern extremity of the farm to the river. The filter beds are five in number, one of which has a layer of gravel, above which is crushed clinkers, the remaining four having no gravel. Locally it is imagined that if a larger number of these bacterial filters be provided, treatment of sewage on land might be dispensed with.

Rye grass is grown on the land, and forms the staple crop : there are but few osiers.

The sludge from the precipitating tanks is removed, apparently at his convenience, by a contractor to a farm which is stated to be outside the Urban District.

There is a storm tank provided at the sewage works to receive the excess of sewage during heavy rainfalls. The overflow from this tank passes direct to the river Blackwater. The excess of sewage is pumped from this tank as occasion offers, and is dealt with on the farm along with the crude sewage in the manner already stated.

The level of the ground water in the neighbourhood of the farm is near to the surface ; this fact renders it difficult to dispose efficiently of much liquid sewage on the farm. At the time of my inspection there had been heavy rain for a considerable period, and the whole farm had the aspect of being waterlogged.

12. *Refuse disposal.*—The removal of house refuse is contracted for. Householders deposit it in buckets and boxes, which, being placed outside the buildings on the street kerb, are emptied thrice weekly by the contractor, and their contents removed to a tip at "the Gold" open ground near the eastern boundary of the district. The contract covers all the Urban District (excluding "the Camp") ; but there are certain outlying parts unvisited by the contractor's carts.

This method of collection has resulted in the almost total disuse within the town of fixed receptacles for refuse, but incidentally the method as practised at Aldershot has drawbacks. Should the contractor's cart be late in its round, and at all times when windy weather prevails, the contents of these receptacles to a greater or less extent get scattered on the roadway ; scarcely one was observed which was fitted with a close cover.

Where fixed receptacles are retained, and are still used, they are never apparently emptied by the contractor's men, and they become a source of great nuisance. As an instance one, in the angle of a yard, measured about 6 feet × 6 feet superficially, the two walls proper to it being some two feet high. Owing to the refuse being heaped some 2 feet to 3 feet above these side walls, the structure of the floor of the ashpit, and whether or not it was sunk below the ground level, could not be ascertained. This receptacle was uncovered, allowing the rain to fall into it. The yard in question, which is at the back of shops facing on different streets at right angles to each other in the most populous and prosperous part of the town, is used in common by a baker and pastry cook, and a linen draper. This ashpit was stated to be emptied not more frequently than twice yearly.

13. *Roads.*—There are within the District :—

Dedicated Roads	...	...	...	20½ miles.
Undedicated Roads	...	...	...	4⅕ „

The kerbing and guttering of the roads, although somewhat defective, have been considerably improved of late. As a rule roads are well and cleanly kept, being regularly scavenged by men employed by the Urban District Council.

The roads in the Urban District have more traffic over them than is usual in a town of the same size. The number of horses in the Camp of Aldershot usually amounts to about 3,500, and there is a strong contingent of Artillery, and of the Army Service Corps, with their necessary trains of waggons. For Camp purposes use is naturally made of the roads in the Urban District. This leads to extra wear of roads, and also imposes the need of more frequent scavenging of the District.

14. *House accommodation.*—Aldershot is an example of a town built in a hurry. In the centre of the town the houses are crowded together, and back-yards have been utilized for the erection of warehouses, stables, &c. Towards the outskirts there is more facility for the circulation of air about dwellings. With comparatively few exceptions, the buildings are not of a superior class. The average householder here cannot afford to pay a high rental. During the last two years more attention has been given to houses in process of building, and the building bye-laws have been much more strictly enforced than was formerly the case.

Speaking generally, the eave-spouting of houses is defective throughout the district, with the result that the walls and footings of dwellings are often damp. The dampness of the foundations is often due to rain water pipes terminating 3 or 4 feet from the ground, having originally been intended to discharge over a water butt. With the extension of the water service to the houses, the necessity of having a water butt has ceased to exist, and rain water butts have almost disappeared. Meanwhile the rain water pipe has not been led to a drain, nor has the necessary gully been supplied.

There are several houses of the back to back type, *i.e.*, without means of through ventilation. Some of the older houses are partly built of wood, and one or two were observed which were manifestly unfit for human habitation.

15. *Back-yards.* There is a general absence of paving of back-yards, and in such back-yards as are paved, the paving is often defective. Many back-yards are shared in common by several houses. Some of the smaller houses

have their back gardens separated from one another by open wooden palings, which allow of a greater freedom of circulation of air than would be the case if two gardens were contained by brick walls.

The condition of the back-yards will be referred to again under the heading "24. Keeping of Animals."

16. *Common Lodging Houses.*—There are nine common lodging houses on the register. They vary very considerably as to their cleanliness, and as to the provision of sanitary requirements. Certain of them are extremely neat and well kept. There are, however, instances where washing accommodation for the lodgers can scarcely be said to exist; others where the cubic space allotted to each bed falls far below 300 feet. Notices, which should be displayed, showing the number of lodgers the room was licensed to accommodate, are often absent, and, if present ,illegible; beds are now and again in excess of the number for which the room was licensed; floors are unscrubbed and dirty; dust is thick on window-sills, showing the windows have been kept unopened for considerable periods; fireplaces are boarded up, and partitions between the beds of married couples do not screen the whole of the bedsteads, nor reach to within six inches of the floor. In other words, the byelaws regulating the keeping of common lodging houses are flagrantly violated.

17. *Houses let in lodgings.*—There are rows of large houses, *i.e.*, houses of more than two stories, built in the early days of Aldershot, which are now let in lodgings each of one or two rooms, to a plurality of families. The sub-letting of such houses is a special feature, peculiar to the district. It would seem desirable that such tenement houses should be regulated by byelaws.

18. *Overcrowding.*—Overcrowding of persons in houses is not often brought to the notice of the District Council. It is said that such overcrowding, if it exist, is difficult of detection. Still, there can be no question that at times overcrowding must exist in certain localities, and attention should be directed to this matter with a view to regulating "tenement" houses by special byelaws.

19. *Footpaths and byeways.*—There are many footpaths, and byeways, giving access to back-yards in Aldershot. As a general rule they are unpaved, undrained, and in wet weather sloppy and generally unclean. Such footpaths should receive the special attention of the District Council.

20. *Isolation Hospital Accommodation.*—With the exception of a galvanised iron hut erected on a brick foundation at the Sewage Farm, and hurriedly put up to receive a case of small-pox, the Urban District Council were until quite recently without isolation hospital provision. The iron hut has been of late occupied as a residence by a man employed on the Sewage Farm.

In March, 1898, the Urban District Council purchased, for the purpose of building thereon an Isolation Hospital, a piece of land three acres in extent, along with a right of way to it from Cemetery Road twenty feet wide. The land adjoins the cemetery towards the North Town portion of the district.

The surface of the site is fairly even, and there is a gentle slope to the north. The subsoil is sandy, and it is not anticipated that it will be necessary to underdrain the land in question. It is surrounded by a quickset hedge on two sides, the 6 feet brick wall of the cemetery forms a third boundary, and the garden hedges and palings of a row of small houses close it in on the fourth side. A main drain has been laid to join the public sewer of the district, and the gas and water mains have been carried on to the site.

On this piece of land there has been erected an Administration Block, which has been so arranged that patients can be received and treated therein while the hospital ward pavilions are being built. A building and apparatus for disinfection, after the pattern of Washington Lyon, with separate chambers for the infected and disinfected articles, have been provided.

A ward pavilion, separated into two wards of four beds each, with a nurse's sitting-room between them, is in course of erection.

These buildings are of brick.

At the time of my inspection the Administration Block was completed but not furnished, and no patients had yet been treated on the site.

As application for permission to raise a loan for the purchase of the ground and for erection thereon of an Isolation Hospital has not been made to the Board, the plans, &c., of the Hospital have not been submitted to the Board for approval.

21. *Mortuary.*—There is a mortuary standing in the yard of the Urban District Council. It is built of brick and has a properly cemented and drained floor. This was erected in 1883.

There was at one time a dead-house at the cemetery. About 1884 the slates from the roof of this building were removed and glass substituted, and it was used as a conservatory. It is now utilized as a tool house.

22. *Slaughter Houses.*—There are three licensed slaughter houses in Aldershot ; on the whole they appear to be fairly well kept. It would be of advantage if cisterns were placed in each some distance above the ground to provide adequate force and sufficient quantity of water for flushing purposes.

23. *Dairies, Cowsheds, and Milkshops.*—There are 10 cowkeepers and 18 milksellers registered in the district.

The greater number of the milksellers only receive a small quantity of milk daily and retail it to their customers. They are tradesmen such as grocers, who supply other commodities. It is stated as regards these retailers that no milk is stored on their premises during the night.

The dairies for the great part are kept clean and are suitably ventilated. Instances were observed where dairies exist in connexion with cowsheds. In such cases the water for washing the cans, &c., is obtained from surface wells, sometimes dip wells, the water of which, from the position of the wells close to undrained farm mixens, must be liable to pollution.

Apart from the cowshed at the Camp Sewage Farm, there is no such thing as a " model " cowshed in the district. The greater number of the cowsheds have a brick, or partly brick, floor, the surface of which is irregular and often dilapidated, allowing the liquid manure to settle in small pools and to soak between the bricks. The liquid manure which is not absorbed in the cowsheds finds its way, by means of an open brick gutter, passing at the rear of the beasts' stalls, to the farm mixen, where the dung and litter is deposited, to remain until cleared away as may be convenient. Some of these mixens are said to be drained to cesspools, others are undrained.

The usual arrangement is for the cowsheds to occupy one, two, or three sides of a square, the partially enclosed space forming the mixen.

Most of the cowsheds have a brick wall running at one side, and a wooden wall on a brick foundation at the other. Some are built wholly of wood. In few cases is any attempt made to procure through ventilation by means of windows, &c., although in some cases the cross ventilation is ample owing to the dilapidated state of the buildings.

But few of these buildings could be considered clean. Indeed, from their construction, especially of those whose ceiling is formed by the slates or tiles of the roof, it is almost impossible to comply with the local regulation for the management of dairies, cowsheds, and milkshops : " Cause the ceiling . . . cowshed . . . to be thoroughly lime-whited or coloured : Provided that the foregoing requirement shall not apply to any wall the internal surface of which is painted, or where the material of or with which such surface is constructed or covered, is such as to render the lime-whiting or colouring thereof unsuitable and inexpedient, and where such surface is thoroughly cleansed."

Most of the cows are milked in the stalls.

A large amount of the milk consumed in the district is obtained from outside the urban district.

24. *The Keeping of Animals.*—There are many animals kept in Aldershot ; indeed the general impression left upon me after an inspection of the district

spread over nearly three weeks is, that there is scarcely a back yard in the town where one or more animals is not to be found. Almost every householder has a watch-dog, often more than one ; cats abound, fowls are largely kept, as are ducks to a lesser extent. Rabbits are numerous, and pigeons and doves are not unknown. There are also canaries, thrushes, linnets, larks, &c., in cages of varying size.

Pigs, however, are much less abundant than other animals ; they are only to be found on the outskirts of the district.

In the most populous part of the town there is one cowshed, but horse-stables are numerous.

Of the animals mentioned, the most serious nuisances arise from the keeping of fowls and horses. Fowls are kept, often in large numbers, in undrained and unpaved back yards, the soil of which has become grossly polluted and must be rich in putrifying animal matter. Many of such yards are of small size and situated in the most thickly populated part of the town.

The nuisance arising from the keeping of horses is associated with the resulting manure. The local byelaws explicitly set forth that a suitable receptacle for manure shall be provided, and so constructed that the bottom or floor thereof shall not in any case be lower than the surface of the adjoining ground, and that it shall be maintained in such a condition as to prevent any escape of the contents thereof or any soakage therefrom into the ground or into the wall of any building ; that a suitable cover shall be provided, and the manure, &c., removed at least once in every week.

In the course of inspection only one receptacle for stable manure was observed which was covered over, and many instances came under notice where the byelaws were violated in every particular mentioned above.

One stable was observed towards the centre of the town which was a dilapidated building roughly constructed for the most part of wood in which two horses were stabled. It was undrained ; the liquid manure ran into an unpaved yard to join that which had oozed, or had been washed by rain, from the dung heap. The stable manure was held in a heap by open planking immediately outside the stable. There were sundry fowls and some rabbits in the yard, and refuse such as old bottles, scrap iron, &c. The surface of the ground was sloppy and filthy in the extreme. In a contiguous house two fatal cases of diphtheria had occurred. Still the yard had not been dealt with by the officers of the Urban District Council, though the drainage of the dwelling-house had been reconstructed.

25. *Offensive Trades.*—There are no offensive trades carried on at the present time within the district.

26. *Schools.*—There are in Aldershot Town several Public Elementary Schools, and they are distributed as follows :—

At the West End of the Town, in Queen's Road, and close to each other, are—

(*a.*) The West End Board Schools, for girls and infants, built in 1873.

(*b.*) The West End New Board Schools, for boys, opened on 3rd October, 1898.

(*c.*) St. Joseph's Roman Catholic Schools, which have a "mixed school" and an "infant school." They have been built many years.

At the East End of the Town, and also close together, are—

(*d.*) The East End Board Schools at Redan Hill, built in 1874, and afterwards enlarged. They consist of "boys'," "girls'," and "infants'" schools.

(*e.*) The National Schools, High Street, which have a "mixed school" and an "infant school."

Towards the northern part of the district, known as North Town, there is an infant school. It was built in 1865, and taken over by the School Board in 1872.

In addition to the above-mentioned public schools there are many private schools, but they are not, as a rule, of any considerable size.

The older school buildings are naturally not to be compared, either in construction or design, with the recently erected West End Board Schools for boys.

It is worthy of note that the drainage and water-closet accommodation of all the public schools has been recently revised. Every elementary school has now trough closets automatically flushed, and urinals, and, as far as the West End and East End Board Schools are concerned, these were found scrupulously clean and in working order.

C.—Sanitary Administration in the Town.

27. *Constitution of the Sanitary Authority.*—Under "The Public Health Supplemental Act for Aldershot, 1857," the Local Board of Health was instituted, comprising twelve members, nine of whom were elected by the ratepayers, and three nominated by the Principal Secretary of State for War. Under an Order of the County Council of Southampton, dated 14th August, 1893, given under the Local Government Act, 1888, this arrangement was altered: the number nominated by the Principal Secretary of State for War remains the same, but the number elected by the ratepayers has been increased to twelve. Thus the present Urban District Council of Aldershot consists of fifteen members, of which Mr. A. H. Smith, J.P., is the chairman. The military members are Colonel C. W. H. Douglas, A.A.G., Lieutenant-Colonel Pitt, R.E., and Surgeon-General O'Dwyer, M.D.

28. The *Medical Officer of Health* is John Shoolbraid, M.D., M.R.C.S., who was elected to the office in 1866. No part of his salary of £30 is repaid out of the county funds, and he is not under the Board's Order of March 23rd, 1891. Consequently he does not forward copies of his annual and special reports to the Local Government Board.

Dr. Shoolbraid does not devote all his time to the duties of his office, being likewise engaged in private practice. He has lived in Aldershot ever since it became a town.

29. The *Inspector of Nuisances* is Mr. John Butler. Salary, £104 per annum. Mr. Butler originally served in the army, and then in the police force. He was appointed Inspector of Nuisances in 1887. Recently he has begun the study of sanitary science with a view to obtaining a certificate.*

30. The *Surveyor* is Mr. Nelson Dennis. Salary, £225 per annum. Appointed November, 1897. Mr. Dennis is a member of the Sanitary Institute, and previous to his appointment at Aldershot he held the position of Surveyor and Waterworks Engineer, and was also Inspector of Nuisances, for the Urban District of Cowes, before which he worked in the office of the Borough Engineer at Stockton-on-Tees, where he subsequently became Engineering Assistant, and afterwards held a similar appointment under the Camberwell Vestry. He is a member of the Association of Municipal and County Engineers, a member of the Society of Architects, and an Associate Member of the Institution of Civil Engineers.

He came into office at Aldershot at a time when there were many arrears of work in his department, which he set himself resolutely and zealously to remove. His knowledge of sanitary work has been of great advantage to the district.

31. *Acts and Byelaws adopted.*

Acts.—The Urban District Council have adopted the following Acts, which came into force in the district on the dates placed against each :—

Act.	Date.
Public Health Act Amendment Act, 1890	23rd February, 1891.
Infectious Disease (Prevention) Act, 1890	25th March, 1891.
" " (Notification) Act, 1889	" " "

* Since this Report was written I have learnt that Mr. Butler, and Mr. Watmore, who is an assistant in the Surveyor's Office, have both obtained such certificate.

Byelaws.—The byelaws in force in the district, with their subject matters and dates of confirmation, are given in the following table :—

Byelaws.	Date.
Cleansing of footways, pavements, and cesspools	26th August, 1887.
New streets and buildings	" " "
New buildings	3rd January, 1896.
Common lodging houses	26th August, 1887.
Nuisances	" " "
Slaughter houses	" " "
A pleasure ground	" " "
The management of a mortuary	" " "
Offensive trades (blood boiler, blood drier, bone boiler) ...	" " "
Hackney carriages	" " "
" "	14th January, 1896.

32. *Regulations for* the management of *Dairies, Cowsheds, and Milk Shops*, came into force in the district on the 3rd of May, 1887.

33. *Action taken in connexion with infectious disease.*—On the notification of a case of infectious disease, the Medical Officer of Health or the Inspector of Nuisances visits the house, and notice is given by these officers to the occupiers to remedy any defects which call for immediate treatment.

The case is reported to the next monthly meeting of the Sanitation Committee. This Committee issue the necessary statutory notice, on the report of their officers, directing compliance with the demands previously made.

This method of procedure has been in force for a little more than a year.

Since the end of January, 1898, information has been given by the Medical Officer of Health to the school attendance officer, who calls daily for the purpose, of every case of notified disease. If the patient be an attendant at school, or if children from the infected house attend school, the school attendance officer visits the school in question, and warns the schoolmaster or mistress. The children from the infected house are not allowed to attend school.

The District Council supply disinfectants to the occupiers of infected houses, as required, and undertake the duty of disinfection of premises free of charge. This disinfection consists of sulphur fumigation. They also issue a series of "suggestions for preventing the spread of infectious or contagious diseases."

Recently the District Council submitted to competent authority samples of "swabs" from the throats of certain children notified as suffering from diphtheria, and in most of such cases the diagnosis was confirmed on bacteriological examination.*

D.—The "Camp" in its relation to the town.

34. *General Sanitary Conditions of the Camp and Sanitary Administration so far as they have a bearing upon Prevention and Control of Diphtheria in the District.*—The Urban District of Aldershot comprises, as has been previously stated, within its boundary a large area of property vested in the War Department. The part thus included consists of the whole of the South Camp, which is bounded on the north by the Basingstoke Canal, and a small strip of the North Camp. The boundary line of the Urban District starting from Lynchford corner on the river Blackwater on the east, passes nearly due west, north of the Camp Sewage Farm, the Kennels, the cricket ground, and across the Queen's Parade to cross the Basingstoke Canal by Claycart Bridge. It thus happens that the portion of the North Camp which includes the Barracks (the Marlborough Lines), is outside the Aldershot Urban District. The Camp Sewage Farm, in the North Camp is, however, included in the Aldershot Urban District.

* This procedure was also adopted by certain of the medical practitioners of the town, and one of them usually attached to his notification a telegram from the Clinical Research Society, to the effect that the diagnosis of diphtheria had been confirmed bacteriologically.

The Military Isolation Hospital at Thornhill, to which all the patients in both North and South Camp as well as those from the Camp at Pirbright and the Barracks at Woking suffering from infectious diseases are removed, is in the South Camp, and therefore in the Aldershot Urban District. It thus happens that the death rates of the Farnborough Urban District, and of the districts in which the Camps at Pirbright, and the Barracks at Woking are situated, are lessened at the expense of the Aldershot Urban District.

Enteric fever cases are treated in the wards of the General Hospitals, to wit, the Cambridge ("General") Hospital in the South Camp.

The Camp is divided into three main sets of "lines," of which the "Marlborough Lines" are entirely in the North Camp, and the "Stanhope Lines" and "Wellington Lines" are entirely in the South Camp. Of these the "Stanhope Lines" are placed between the "Marlborough Lines" and the "Wellington Lines," from the former of which they are separated by the Basingstoke Canal, and from the latter, roughly by the crest of a hill. The "Wellington Lines" extend down to the town of Aldershot.

Of these divisions of the Camp, the buildings in the "Wellington Lines" are the oldest. They are large barracks built for the most part of ordinary brick.

The buildings in the "Stanhope" and "Marlborough Lines" have all been constructed during the past few years and are of red brick.

There are scarcely any of the old wooden huts now remaining which formed such a well-known feature of the Camp until quite recent years.

Camp Sanitary Administration.—The Principal Medical Officer is the Sanitary Officer for the Camp. Once in every year he makes a personal inspection of the Camp in minute detail. This is by no means the only inspection made by him, but it is a routine inspection; other inspections of particular portions of the Camp are made at his discretion and as required.

Of recent years he has received the assistance of a medical officer specially appointed as Assistant Sanitary Officer, who in addition to making such special inspections as the Principal Medical Officer may depute to him, also has charge of the bacteriological and chemical laboratory attached to the Cambridge Hospital.

At the present time the Principal Medical Officer is Surgeon-General O'Dwyer, M.D., and the Assistant Sanitary Officer is Captain Louis Hughes, Royal Army Medical Corps, who was the first officer appointed to the post, the date of the appointment being December, 1897.

Captain Hughes has made special study of bacteriology and is a diplomate in Public Health.

Reports on sanitary matters are made to the Principal Medical Officer by the various Medical Officers of the Camp. Each block or series of blocks of buildings is in the immediate charge for sanitary matters of a Medical Officer. It is this Officer's duty to make a weekly detailed inspection of the block or blocks under his care, and to report any defect observed to the Principal Medical Officer and to the Officer Commanding the "Unit" concerned.

When a case of infectious disease occurs the Medical Officer in charge of the quarters at once reports the fact to the Principal Medical Officer, and to the Officer Commanding the regiment or "Unit," and to the General Commanding the Brigade. He further makes investigation into the circumstances connected with the case, and furnishes a report thereon to the Principal Medical Officer. He superintends the disinfection of the premises, and reports to the Officer Commanding the "Unit" that the quarter is ready to be handed over to the Royal Engineers for white-washing or re-papering, as the case may be. When the Royal Engineers have completed this work they notify the fact to the Medical Officer in charge of the quarters, who, in his turn, notifies to the Officer Commanding the "Unit" and to the Principal Medical Officer that the quarters are ready for re-occupation.

As a matter of routine the Medical Officer in charge of the infected block invariably examines all the other persons in the married quarters or barrack room where the case has occurred. The entire family in the married quarters, all the

inmates of a barrack room or ward, are, when an infectious case occurs, removed to other quarters; the children are withheld from attending school, and the soldier ceases to do duty. Any suspicious case is kept under observation for at least a week.

When a case of diphtheria has occurred in a particular army school, the Medical Officer in charge of that school makes a frequent examination of the children attending it. This inspection has been made as often as daily when occasion seemed to demand it.

In 1897, when diphtheria was extremely prevalent in the Camp, the various Medical Officers examined every child resident in that part of the Camp which was affected.

The Army schoolmasters and schoolmistresses are instructed to direct the attention of their Medical Officer to any child which appears to be sick or ailing.

On discovering a case of infectious disease the Medical Officer concerned telegraphs to the Cambridge Hospital, with the result that one of two special ambulances is at once despatched to remove the patient to the Isolation Hospital; this ambulance is disinfected after each act of service. A special covered van, painted red, is sent to remove to the Isolation Hospital all such articles as bedding, clothes, &c., as are in the opinion of the Medical Officer in need of disinfection. When disinfected, such articles are returned in a special covered van, painted white.

The furniture, flooring, and painted woodwork of the infected quarters, as far as practicable, are washed down with corrosive sublimate solution or a solution of chloride of lime, as the Medical Officer in charge may direct, and soap and water are freely used. Frequently there is practised fumigation by means of sulphur dioxide gas, but it is laid down that this is not to be relied upon in place of disinfection by other means. The windows of the infected room or rooms are kept open for as long a period as practicable. The ceilings are then whitewashed, and the walls distempered by the Royal Engineers. In the case of papered walls, the paper is stripped off, and the room re-papered.

As a routine practice the Army schools are not disinfected on the occurrence of a case of infectious disease among the children, although such a course has now and again been undertaken; for instance, in 1897, when scarlatina became prevalent among the scholars of a particular school, the whole school building was disinfected.

Each school building is disinfected as a matter of routine during each vacation, when everything which it is possible to subject to soap and water is washed and scrubbed. The walls are distempered and the ceiling whitewashed, as may be required.

The diseases scheduled as infectious by the Medical Department of the War Office, and the full details of the administration, are contained in the Regulations for the Army Medical Services, 1897.

The above account simply sets forth the administrative arrangements as practised in the Camps, when dealing with infectious disease generally.

In dealing with cases of diphtheria, precautions in addition to the above are observed.

On the arrival of the patient at the Isolation Hospital, the Medical Officer in charge takes a "swab" from the throat, nose, &c., and sends this immediately, with suitable precautions, to the Laboratory at the Cambridge Hospital. On the day of its receipt, cultures of the material are made, and the result is telegraphed the following day to the Medical Officer in Charge of the Isolation Hospital. Should the bacteriological examination prove negative in the first instance, the Medical Officer of the Isolation Hospital uses his own discretion as to forwarding further samples for examination. As a matter of fact, he generally does submit further "swabs," but the mere fact that there has been failure to isolate the diphtheria bacillus does not preclude him from entering the diagnosis as "diphtheria," and when once a case is diagnosed as diphtheria, whether by bacteriological examination or on clinical grounds, the patient is not allowed to leave the Isolation Hospital until repeated examinations of the throat

secretions and nose discharge, during convalescence, have shown the bacillus to be absent. In the event of the bacillus being reported present, the Medical Officer of the Isolation Hospital has no option, but must enter the case as one of diphtheria.

The Military Isolation Hospital stands on the summit of Thornhill. Taking the circumstances of the Camp into consideration, this is probably the most isolated place that could have been selected. The buildings are surrounded by an open fence of iron spiked railings.

The hospital, erected by the Royal Engineers, is of red brick. It was opened on 1st August, 1896, and has been added to at intervals until at the present time there are two pavilions, each having two wards of six beds each; two pavilions of eight beds each; and two pavilions of four beds each; the total number of beds available being 48. There is an administration block, a small mortuary, a disinfection block, and a lodge in which the sergeant in charge resides—all separate buildings.

There is also a temporary building of wood, erected for a discharging block, having a bath-room in the centre, but no water supply has yet been laid on to it. This is to be replaced by a similar but permanent building of brick. There is, however, no laundry block, and no bathing accommodation has been provided for the female nursing staff.

The disinfecting apparatus is a Recks (Copenhagen) steam disinfector, and there are separate chambers for the infected and disinfected articles. There is also in the block a chamber for storing the uniforms, &c., of the patients after disinfection, as all soldiers in hospital wear special ward clothes.

This regulation *re* ward clothes applies to the orderlies of the Royal Army Medical Corps doing duty in the Isolation Hospital. They only wear the uniform of their corps when off duty outside the Isolation Hospital.

In dealing with infectious sickness no sharp distinction is drawn between the military and the civil population of the Camps. There are civilians resident in the Camps, such as canteen keepers, officers' servants, &c., and when any such, or their children, are attacked by infectious disease they are removed to the Military Isolation Hospital for the safety of the Camps, although they are not soldiers, nor "borne on the strength" of a regiment.

The wives and children of soldiers married without leave are not "borne on the strength," and are therefore civilians. These persons are not entitled to quarters, and reside outside the Camp, the soldier-husbands having in some instances a "sleeping out pass." These families are not recognised in any official sense. Thus they are not entitled to medical attendance, but as a matter of grace on the part of the Medical Officers of the Army this attendance is freely and readily given, if solicited. The Principal Medical Officer has power to permit medicines to be issued to them in suitable cases; but they are not admitted to the Military Isolation Hospital unless they happen to occupy Government quarters.

The same broad views are held as regards the Army Schools. The children of civilians resident in the Camps are permitted, by grace of the War Department, to attend the Camp Schools, and thus in many instances a long daily tramp to the Board Schools is obviated. Soldiers "married on the strength," for whom no "married quarters" can be furnished in the Camps, are either provided with hired quarters in the Town, where there are several houses in a particular street rented for the purpose, or they receive payment in lieu of quarters.

The children of such soldiers attend the Army Schools, or they may go to the Board Schools on obtaining permission to do so from the Military Authorities.

Army Schools.—These schools, being the property of the War Department, are administered under the "Army School Regulations, 1898," and the "Standing Orders for Inspectors of Army Schools, Examiners, and Teachers, 1899."

The Army Schools are attended by such of the soldiers who have not attained a certain standard of elementary education. Adults attend the same schools as the elder children, but at different hours. The following table gives

the situation and number of the Army Schools in the Camps of Aldershot, with the number of adults and children carried on the books of such schools in the month of January, 1899 :—

TABLE showing the situation and number of the Army Schools in the Camps at Aldershot, with the number of adults and children on the books of such schools during the month of January, 1899.

Situation.	School.	Number of Scholars on the Books.		
		Adults, 15 years and upwards.	Elder Children, 8–14 years.	Infants, 3–8 years.
Wellington Lines—				
East Cavalry Barracks ...	No. 1 Garrison School ...	96	60	—
Salamanca „ ...	No. 2 „ „ ...	204	57	—
Royal Artillery „ ...	No. 3 „ „ ...	53	69	—
West Cavalry „ ...	Cavalry Brigade Infant School	—	77	33
Salamanca „ ...	3rd „ „ „	—	—	96
Royal Artillery „ ...	Royal Artillery „ „	—	34	63
Stanhope Lines—				
Barossa Barracks	No. 4 Garrison School ...	275	83	—
"East of St. George's Church"	No. 5 „ „ ...	270	205	—
South of "A" Square ...	1st Brigade Infant School ...	—	—	99
„ „ „ ...	Model „ „ ...	—	—	202
Barossa Barracks	1st Brigade Elder Girls' School	—	94	—
Near Thornhill Terrace ...	2nd Battalion Northampton Infant School.	—	—	35
Marlborough Lines—				
Oudenarde Barracks... ...	No. 6 Garrison School ...	371	85	—
„ „	2nd Brigade Infant School ...	—	—	152
„ „	2nd Brigade Elder Girls' School	—	75	—
Total on School Books		1,269	839	680

E.—GENERAL CONSIDERATIONS ON THE PAST AND PRESENT PREVALENCE OF DIPHTHERIA AT ALDERSHOT.

35. *School Influence on Diphtheria in the Town.*—It has not been possible to ascertain for the Town, with any exactness, the schools attended by the children attacked by diphtheria ; no record has been kept by the officers of the District Council with reference to these matters. An attempt has, however, been made to compile this record, but owing to the removals of families it is necessarily incomplete, and of certain cases which might prove the connecting links between separate series of attacks no record has been obtained. Of necessity also "notified" cases could alone be dealt with, there being no means of ascertaining what had been the relation, if any, with schools of throat illness not designated diphtheria.

So far as can be ascertained, there were certain children attacked during 1893 who were scholars at either the West or East End Board Schools, or at a certain private school.

In 1894 a school teacher at the National School was notified as suffering from diphtheria, and cases occurred among the scholars of the West and East End Board Schools, and one case in another private school.

In 1895, as far as the record goes, there was only one notified case among the scholars attending the West End Board School, two in private schools, some five cases in the East End Schools, and the North Lane Infant School had one case.

In 1896 there were cases notified among the scholars of the West End Schools at the beginning and end of the year, two private schools appear to have had cases, and there were several in the East End Schools.

In 1897, as far as the imperfect record shows, no case was notified among the scholars of any of the schools prior to May, except in the West End Schools, where some four occurred in the Infant School. The West End Schools will be referred to later on.

In May there was a single case notified in the East End Schools, probably in the Infant School; and, as far as these schools are concerned, there was a case in July, and no other cases till October.

In June a girl, aged 7 years, was notified as having diphtheria, and she was attending the St. Joseph's Roman Catholic School. This is the first case recorded as occurring among the scholars of that particular school. There was a case among the boys in July and another in August, but the age of one of these scholars was not ascertained, and there was a case among the infants in December. These appear to have been all the recognised cases among the scholars during 1897.

The North Lane School had one case notified among its scholars in August and another in September, the National School a single case in September, and there were three cases in two private schools.

The bulk of the children attending school who were known to be attacked during the year were scholars at one or other of the West End Board Schools. There appear to have been notified among the children of these schools the following cases:—

	Infants.	Boys.	Girls.
June...	1	—	—
July	4	1	—
August	1	—	—
September	3	1	1
October	1	—	2
November	3	2	1
December	2	—	3

In 1898 cases were notified among the scholars at one or other time in each of the Public Elementary Schools; and in the months of November and December all of these schools had cases among their scholars. The District Council, therefore, closed the schools on 13th December.

In 1899 three cases were notified in January, and one in February, at the Girls' School, and one in February at the Infant School of the West End Board Schools. There were three cases in the two months at St. Joseph's School, and one case in January at the National Infant School. At the East End Board Schools one case was notified in the Girls' School in January and another in February, and one in the Infants' School in January. Two cases are recorded as occurring in private schools.

On 13th February, 1899, the Infant Schools of the East End Board School and of the National School were closed by the School Authorities on account of the prevalence of measles. The notifications of diphtheria practically ceased at the same time, no case being notified between February 13th and 28th; by the latter date the schools had been re-opened.

Chart 5 in Appendix shows for both Town and Camps the varying periods during which the schools were closed during 1897 and 1898, and gives the number of notified diphtheria attacks week by week during those years, and of each case which proved fatal.

Table L in Appendix gives the known number of notified attacks by diphtheria occurring among the scholars of the various schools in the Town from 1st January, 1897, to 28th February, 1899.

As to means at school for facilitating spread of diphtheria; during my inspection of Aldershot Town each school was visited and inquiry made into certain matters, including the method in vogue for cleansing the slates used by the pupils. The answer to this query was practically the same at all the schools, and was to this effect. The schoolmaster or mistress had a mop or sponge attached to the end of a stick, which he or she dipped into water, and moistened the slate; the children, with a rag or wiper which they provided themselves, then cleaned the slate. This was the theory, but the practice would

appear to be somewhat different, as on one occasion when a statement similar to that set forth above had just been completed by a teacher, another teacher in the schoolroom ordered a class of infants to clean their slates. This they proceeded to do by expectorating on, or licking the slates, and rubbing them with their rags. If a child had no rag it borrowed a neighbour's, and the rags themselves were moistened in similar manner to the slates.

Given a case of infectious sore throat it is easy to see how it might be spread by such methods as above described. Added to this is also the fact that the slates are the property of the school, and no child exclusively uses one slate.

The systematic inspection of the throats of children attending school with a view to eliminate all suspicious cases has never been attempted.

Inquiries were made as to disinfection as carried out at the schools, and they tended to show that disinfection was far from thorough, and in the case of the East End Board Schools most perfunctory.

36. *School Influence on Diphtheria in the Camps.*—It has been seen that among children the bulk of attacks by diphtheria since the beginning of the year 1897 fell upon those of the school attendance age.

On page 18 of this report is given a list of the Army Schools. The children attend the schools in the Lines in which they live, and for the years 1897 and 1898 the bulk of the children known to be attacked by diphtheria were resident in the Stanhope Lines.

Chart 5 shows that in the year 1897, at a time when the Army Schools were closed for the summer holidays, in July, there were several cases of diphtheria in the Camps, and that the greater number occurred among children ; in the same year, previous to this outbreak, there had been but few cases of diphtheria in the Camps, and of these cases only two were children, one child being attacked in the first week in February and the other in the third week in May. This matter will be referred to later.

In 1897, the attention of all the Army School masters and mistresses was directed to the danger of diphtheritic infection likely to be incurred by children in licking slates and pencils which were used in common, and arrangements were made for the slates to be moistened for cleansing purposes by those in charge of the school-room.

37. *The Influence of Infection spread from person to person* (a) *in the Town*, (b) *in the Camps.*—(a) *In the Town.*—There can be no doubt that the circumstances of many of the households invaded by diphtheria were such as to render isolation at home impossible, and the influence in the spread of diphtheria of the want of isolation of the sick cannot be disregarded. Throughout, up to the end of February, 1899, no cases had been treated in hospital. Many instances were observed in which a secondary case or cases had occurred in families where, if the first case had been effectively isolated, it would be reasonable to suppose that no such secondary cases would have occurred. The attacks appeared to have taken place to a great extent among those who, from their daily avocations, would the most readily be brought into contact with infected persons.

(b) *In the Camps* it was observed that children of different regiments to a great extent associate and play together in the immediate neighbourhood of their own barracks, and this to the exclusion of other children. They do not seem to visit the Town unless sent on messages or errands.

Nevertheless there is constant intercommunication between Town and Camps. Tradesmen visit the Camps, and the soldiers' wives come down to the Town to make purchases.

There are eight canteen managers in the Stanhope Lines, and it is worthy of note that cases of diphtheria occurred in the families of four of them. They are, as a class, by reason of their occupation, most frequently brought into business and social connexion with the townsmen.

It is no uncommon practice for the wives of soldiers married off the strength of the regiment, and in some instances for the elder children of such, to go into the Camps daily to act as nurses to the children of the Warrant and

Non-Commissioned Officers. Again, soldiers married off the strength, whose wives live in lodgings in the town, are under no restrictions as to their quarters. Theoretically, they are required to report infectious sickness, but often they do not, and cases come under notice where not only the soldier returned nightly to his lodging when his children had diphtheria, but even slept in the same room with them.

There are many habits incidental to the soldier, both inside and outside of barracks, which render the transference from one to another of infectious sickness possible, but enough has been said to show that the Camps and the Town are in close relationship.

38. *General Considerations concerning the Town with reference to Diphtheria.*—As has been set forth under the sanitary circumstances of the district, the sewerage of the Town is imperfect, and the superficial soil polluted with organic filth through the keeping of animals. Many houses are damp, and many were built before the time at which the advantage of damp courses and concrete and cemented foundations was appreciated. These are conditions to be thought of as tending to lower the bodily vitality of the inhabitants, and to a corresponding extent their resistance to disease.

It is true that at some of the houses invaded by diphtheria the water supply was derived from surface wells, but no importance can be held to attach to the circumstance in so far as this disease is concerned.

As to how far the disease has been transmitted from man to the lower animals, and from them back to man, cannot be determined. Inquiry showed that in several instances fowls and ducks had been ill, died, or had been killed on account of illness. In one instance, a dog that had been the playmate of several children who suffered from diphtheria had been destroyed on the supposition that it had contracted "distemper." No veterinary surgeon was consulted as to the illness of this dog.

Inquiries made of the veterinary practitioners, showed that diphtheria had been recognised in dogs and cats, and these animals had been treated by them for that disease. In one locality, where diphtheria had occurred in several houses, certain cats were stated to have been "poisoned." Inquiry elicited the fact that a child had recently had a severe sore throat, recognised as diphtheria by the parents, but not so notified by the medical practitioner in attendance. During this child's illness, she had been allowed to have a neighbour's cat to amuse her while in bed. This cat was the first of the series said to have been poisoned; the symptoms were difficulty of breathing and swallowing, and diarrhœa. A second cat in the same house died a few days after the first, with similar symptoms. A third cat, belonging to the next house, sickened while the other cats were ill, and ultimately died. The death took place the night before my visit to the locality, and I obtained possession of the carcase. Captain Hughes, R.A.M. Corps, kindly made a post-mortem examination on this cat; a congested patch was found at the posterior part of the pharynx, which on pressure yielded a yellowish exudation. Plate cultures made from this showed the presence of the Klebs-Loffleur bacillus. Owing to there being no arrangements at the laboratory of the Cambridge Hospital for control experiments on animals, the pathogenicity of the micro-organisms on guinea-pigs could not be put to the test—a fact which is to be regretted.

As regards the milk supply, in possible relation to the diphtheria, although none of the cowsheds visited were free from defect, no disease among the cows was ascertained to have existed. Much of the milk supply of the district is derived from outside the urban district. Several of the milk-sellers retail milk derived from one and the same farmer; in some instances the supply is derived from more than one source; when a milk-seller runs short, he procures milk from another tradesman. Thus it follows that the name of the retailer is very little guide to the source of the milk; but, as far as could be ascertained, the persons attacked at or about the same time derived their milk supply from various sources. There was no instance in which many persons were suddenly and simultaneously attacked where the milk supply was served from a common source, as might be expected in the event of any particular milk supply becoming infected.

39. *Statistics of diphtheria mortality and attack in Aldershot Town and Camps.*—A study of the deaths registered in the Registration Sub-Districts of Farnborough and Farnham,* as having taken place in the Town and Camps of Aldershot over a period of years, shows that death by one or other form of throat sickness has not been absent any one year since 1876, beyond which year investigation has not been made.

It has been set forth previously in this Report that the North and South Camps are in different Registration Districts, and that the deaths from infectious disease for by far the greater part take place at the present time in the South Camp, in which is situated the Military Isolation Hospital. The population of the Camp is not a stationary one. The number of persons varies within considerable limits; but always adults are, in the Camps, relatively more numerous than children, as compared with civil population. The difficulty of estimating the population of the Town with any degree of accuracy is shown on page 3.

In broad and general comparison of the incidence of diphtheria mortality in Town and Camps, the fact must be borne in mind that at census periods, relatively to total population in each instance, children in the Town were three times more numerous than children in the Camps. In the case of disease like diphtheria, rarely fatal at ages over 15 years, the disproportion of children in Town and Camps becomes of importance from a statistical view point.

The following Table, A, gives, for the years 1876 to 1898 inclusive, the number of deaths by diphtheria and allied throat sickness recorded in the Farnham Registration Sub-District, and the Farnborough Registration Sub-District, as having occurred in the Town and Camps of Aldershot. The deaths are shown under certain age groups, viz.: 0–3 years (under the age for school attendance); 3–15 years (at school attendance age); and 15 years and upwards (persons in the main not attending school). The sex is given in each instance.

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* The latter was divided in 1897 into Registration Sub-Districts of Farnham and Aldershot.

TABLE A, showing for the years 1876 to 1898 the number of deaths by Diphtheria and allied Throat Sickness in the Farnham Registration Sub-District as having occurred in the Town of Aldershot and in the South Camp, Aldershot, and in the Farnborough Registration Sub-District as having occurred in the North Camp, Aldershot; and separating such deaths into certain age groups, and allotting them to their respective sex :—

Year.	Deaths registered as due to Diphtheria and allied Throat Sickness in the Town and Camps of Aldershot for the Period 1876 to 1898.																										Total number of Deaths registered as occurring in both Camps, Aldershot.
	Town of Aldershot.									South Camp, Aldershot.									North Camp, Aldershot.								
	0-3 years.		3-15 years.		15 years and upwards.		Total.		Total both Sexes.	0-3 years.		3-15 years.		15 years and upwards.		Total.		Total both Sexes.	0-3 years.		3-15 years.		15 years and upwards.		Total.		Total both Sexes.	
	Sex.		Sex.		Sex.		Sex.			Sex.		Sex.		Sex.		Sex.			Sex.		Sex.		Sex.		Sex.			
	M.	F.	M.	F.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		
1876	—	—	1	—	—	—	1	—	1	1	1	—	1	—	—	1	2	3	2	—	—	—	—	—	2	—	2	5
1877	1	1	—	—	—	—	1	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1878	1	—	1	—	—	—	2	—	2	1	1	1	—	—	—	2	1	3	—	—	—	—	—	—	—	—	—	3
1879	—	2	1	1	—	—	1	3	4	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	1	1
1880	—	—	—	—	2	1	2	1	3	—	1	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	1
1881	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	1
1882	5	1	3	2	2	—	10	3	13	1	—	—	—	—	—	1	—	1	—	—	1	—	—	—	1	—	1	2
1883	4	3	10	12	—	—	14	15	29	1	1	1	—	1	—	3	1	4	—	—	—	—	1	—	1	—	1	5
1884	10	4	11	12	—	—	21	16	37	—	—	1	1	2	—	3	1	4	—	—	—	1	—	—	—	1	1	5
1885	3	2	13	9	—	—	16	11	27	2	4	3	4	1	—	6	8	14	—	—	—	—	—	—	—	—	—	14
1886	2	3	4	6	—	—	6	9	15	1	1	1	2	—	—	2	3	5	—	—	—	—	1	—	1	—	1	6
1887	—	1	—	1	—	1	—	3	3	1	—	1	—	1	—	3	—	3	—	—	—	—	—	—	—	—	—	3
1888 ... ...*	2	1	2	1	—	—	4	2	6	1	—	—	1	—	—	1	1	2	1	—	—	—	1	—	2	—	2	4
1889	—	1	2	1	—	—	2	2	4	1	—	—	—	1	—	2	—	2	—	—	1	—	—	—	1	—	1	3
1890	2	2	—	—	—	—	2	2	4	—	1	—	1	3	—	3	2	5	—	—	1	—	1	—	2	—	2	7
1891	2	—	1	2	—	—	3	2	5	—	—	—	1	—	—	—	1	1	1	—	—	—	—	—	1	—	1	2
1892	—	—	1	1	—	—	1	1	2	—	—	—	—	—	—	—	—	—	2	—	1	5	—	—	3	5	8	8
1893	2	—	1	1	—	—	3	1	4	1	2	—	—	—	—	1	2	3	—	—	—	—	—	—	—	—	—	3
1894	3	3	5	1	1	—	9	4	13	1	1	—	1	—	—	1	2	3	—	—	—	1	1	—	1	1	2	5
1895	1	5	3	—	—	1	4	6	10	1	1	—	—	1	—	2	1	3	2	2	2	2	—	—	4	4	8	11
1896	2	1	3	3	—	—	5	4	9	—	1	1	1	1	—	2	2	4	1	—	4	2	—	—	5	2	7	11
1897	4	6	11	2	—	—	15*	8	23	—	—	3	2	2	—	5*	2	7	—	—	1	—	—	—	1	—	1	8
1898	5	2	12	11	1	1	18	14	32	—	1	5	1	—	—	5	2	7	—	—	—	—	—	—	—	—	—	7
Totals	49	38	85	66	6	4	140	108	248	14	16	17	16	13	—	44	32	76	9	2	11	11	6	—	26	13	39	115
	87		151		10		248			30		33		13		76			11		22		6		39			
	238									63									33									

* These figures do not tally with those given later on in the text; as then the cases are referred to their place of residence at the time of attack, and not to the place where death occurred. For instance, a soldier's child attacked in the Town and removed thence to the Military Isolation Hospital for treatment, and dying there, appears in the above table under the heading South Camp; whereas later in the text it would appear among the cases recorded as having their origin in the Town.

NOTE.—The deaths from 1876–1885 inclusive for the Registration Sub-District of Farnham have been extracted from Dr. Turner's Report. For the Registration Sub-District of Farnborough, for the whole period 1876–1898, and for the Registration Sub-District of Farnham from 1886–1897, and thence onwards for the Registration Sub-District of Aldershot, the figures have been extracted from the local Registers. In every year quoted the number of deaths thus quoted include not only the deaths by "diphtheria," but by similar throat affections. Deaths among patients transferred from the Barracks at Woking and the Camp at Pirbright to the Military Isolation Hospital, South Camp, Aldershot, are not included.

Passing now to non-fatal diphtheria and allied throat illness, as previously stated the Infectious Disease (Notification) Act, 1889, was adopted by the Urban District Council in March, 1891, so that comparison of *attack rates* by diphtheria in Town and Camps is limited to recent years.

The following Table (Table B) gives for the Town and the Camps the number of cases of "diphtheria" and "membranous croup" coming under notice from 25th March, 1891, to the end of the year 1898. As regards the Town, certain cases are included which proved fatal without making appearance on the Notification Returns.

TABLE B, showing for the period 21st March, 1891, to the end of the year 1898, the known CASES of "diphtheria" and "membranous croup" in the Town and in both Camps at Aldershot.

Year.	Known CASES of "diphtheria" and "membranous croup" in the Town and in both Camps at Aldershot from 21st March, 1891, to 31st December, 1898.	
	Town.	Camps.
1891	9	6
1892	17	13
1893	17	15
1894	29	13
1895	36	454
1896	46	249
1897	126	67
1898	155	37

The population of the Town in 1891 at the Census was 12,641, and the estimated population in 1898 was 16,500. The population of both Camps in 1891 at the Census was 16,969, and the average population in 1898 was 19,455.

In the Camps the ages of those attacked by diphtheria and allied throat sickness have not always been recorded, while in the Town no record of the ages of certain persons attacked has been compiled; and the facts cannot now be ascertained.

It is, however, possible to deal with diphtheria in the Camps according as the attack by the disease has fallen on persons 0–15 years, and on persons over that age.

As regards the Town, if all the cases of which either an imperfect or no record exists be taken as occurring in children under 15 years, and the great bulk of such cases would appear to have been in children under that age, a comparison can be made between the attacks rates at the one and the other age in the Town and in the Camps; but it must be borne in mind that rates will for the Town show slightly higher for children and correspondingly lower for adults than really appertained to these age periods.

Table C sets forth for the years 1891 to 1898 the estimated population of the Town and the average population of both Camps, the number of known attacks by diphtheria and throat sickness during those years in each instance, and the attack rates per 1000 of the populations respectively at all ages and at the age-groups of "under 15 years" and "over 15 years" of age.

TABLE C, showing year by year, from 1891 to 1898, for the Town and Camps of Aldershot, the attack rates, by Diphtheria and allied Throat Sickness, per 1,000 of the estimated population, at all ages, and in the age groups of under 15 years of age and over 15 years of age.

Year.	Town of Aldershot.									Both Camps, Aldershot.									Year.
	All Ages.			Age Group 0–15 years.			Age Group, 15 years and upwards.			All Ages.			Age Group, 0–15 years.			Age Group, 15 years and upwards.			
	Population.	Number of known attacks.	Attack Rate per 1,000 of Population.	Estimated Population.	Number of known attacks.	Attack Rate per 1,000 of Population.	Estimated Population.	Number of known attacks.	Attack Rate per 1,000 of Population.	Average Population. (Figures supplied by Military Authorities.)	Number of known attacks.	Attack Rate per 1,000 of Population.	Average Population.	Number of known attacks	Attack Rate per 1,000 of Population.	Average Population.	Number of known attacks.	Attack Rate per 1,000 of Population.	
1891 ...	12,641 Census ...	9	·71	4,840	8	1·65	7,801	1	·13	17,267	6	·35	1,823	5	2·74	14.984	1	·07	1891
1892 ...	13,192 Estimated	17	1·29	5,051	12	2·38 } 2·70	8,141	5	·61 } 0·48	18,374	13	·71	1,783	11	6·17 } 5·42	15,723	2	·13 } 0·13	1892
1893 ...	13,743 „	17	1·24	5,362	12	2·24	8,381	5	·60	18,099	15	·83	1,768	14	7·92	15,825	1	·06	1893
1894 ...	14,294 „	29	2·03	5,473	24	4·39	8,821	5	·57	18,484	13	·70	1,824	9	4·93	16,151	4	·25	1894
1895 ...	14,845 „	36	2·43	5,684	27	4·75	9,161	9	·98	19,522	454	23·26	2,001	51	25·49	17,024	403	23·67	1895
1896 ...	15,396 „	46	2·99	5,895	36	6·11	9,501	10	1·05	20,293	249	12·27	2,178	62	28·47	17,600	187	10·63	1896
1897 ...	15,947 „	126	7·90	6,106	116	19·00	9,841	10	1·02	20,579	68	3·30	2,156	51	23·65	17,887	17	·95	1897
1898 ...	16,500 „	155	9·39	6,317	143	22·64	10,183	12	1·18	19,895	37	1·86	1,999	33	16·51	17,417	4	·23	1898

From this Table it is seen that the attack-rate per 1,000 of persons living at all ages, was higher in the Town than in the Camps until the year 1895, when a remarkable outburst, sustained during many months, occurred in the Camps among adults as well as children ; and that in 1897 and 1898, while the attack-rate at all ages was declining in the Camps, the attack-rate in the Town considerably increased, and became in excess of the corresponding rate for the Camps.

The attack-rates for the age period 0–15 years shows that the rate is higher for children in the Camps than for children in the Town, for each year recorded until 1898, and that the exceptionally large prevalence of the disease which occurred in 1895 in the Camps, although the bulk of the attacks fell upon adults, and those attacked were for the most part soldiers, nevertheless affected, in proportion to the numbers, even more seriously children under 15 years of age.

For the age group over 15 years, it is seen that the attack-rate was much higher in the Town than in the Camps until the year 1895, when, owing to the great outburst in the Camps, the attack-rate there became for that year some 23 times greater than that of the Town. In 1896, the attack-rates in the Camps at ages over 15 years fell somewhat, but was maintained, nevertheless, at a point 10 times above that of the Town, whereas in 1897 the attack-rate in the Town at this age mounted above the corresponding rate for the Camps. In 1898, the rate at this age for the Town had further risen, while the corresponding rate for the Camp had sensibly decreased. These facts are graphically represented in Charts 1, 2, and 3.

Chart 4 in Appendix shows week by week for the years 1895 and 1896 the known cases of diphtheria and allied throat sickness occurring in the Town and Camps of Aldershot. It also distinguishes for the Camps the attacks of women and children from those occurring in soldiers, and the cases of the North Camp from those of the South.

Chart 5 in Appendix shows week by week, from 1st January, 1897, to 28th February, 1899, information similar to that set forth in Chart 4. In addition, it represents the cases which proved fatal in both Town and Camps, and the approximate periods during which the army schools and the schools of the Town were opened or closed for holidays, &c.

Dealing now with the epidemic prevalence of diphtheria which commenced in 1895, it has been possible to note the behaviour of the disease month by month for a series of years, and to go on to scrutinize more closely than has yet been done its incidence on one and another section of population in Town and in the "Camps."

The following Table (Table D) shows month by month the known cases of diphtheria and similar throat sickness which occurred during the years 1895 to 1898 inclusive, in both Town and Camps.

TABLE D.*

Year.	Locality.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1895	Town† ...	6	6	—	1	2	5	4	—	4	1	6	1	36
	Camps‡ ...	5	2	1	1	7	16	70	55	81	112	76	28	454
1896	Town† ...	4	6	2	1	1	6	5	1	5	6	4	5	46
	Camps‡ ...	18	30	27	36	38	21	31	30	9	1	6	2	249
1897	Town† ...	8	6	2	9	1	5	15	13	22	14	15	16	126
	Camps§ ...	1	2	—	—	4	—	9	13	14	12	6	7	68
1898	Town† ...	18	26	15	7	10	7	2	3	2	3	29	33	155
	Camps§ ...	3	2	—	—	—	1	2	5	5	3	10	6	37

* Aldershot being a military centre, receives into its Military Isolation Hospital the cases of infectious disease which occur in the Barracks at Woking, the Camp at Pirbright, as already stated, and such cases as occur among troops in its neighbourhood on the line of

Table D illustrates the sudden development of epidemic diphtheria and throat illness which seized on the soldiers and their children in 1895. In the Camps, in the month of June of that year, the number of attacks began to rise rapidly, and a remarkable outburst of throat sickness took place which only faded out when the troops from the Camps moved out to participate in the manœuvres in the New Forest, which commenced 14 to 15 months later, on 19th August, 1896.

It is worthy of note that the great incidence of the disease in 1895 fell upon the soldiers, and also that the women and children in the South Camp suffered at this time much more severely than the women and children in the North Camp The number of attacks recorded among the men is about equal in each Camp, but it must be borne in mind that the number of men in the North Camp is less than half the number in the South Camp, and that the incidence of the disease on men was more than twice as great in the North Camp than in the South Camp, as the following Table (Table E) for the year 1895 sets forth :—

TABLE E, showing for the year 1895 the number of men, women, and children attacked by throat sickness in the North and South Camps respectively :—

——	South Camp. Stanhope and Wellington Lines.	North Camp. Marlborough Lines.
Men	191	204
Women	8	0
Children	48	3
Total	247	207

Of this large number of certified diphtheria cases, only one man and six children died, the disease being reported as extremely mild in character. Nevertheless the local death registers refer four deaths, in addition to those mentioned above, to sickness allied to diphtheria, and these were all deaths of children.

What were the conditions mainly conducing to the sudden epidemicity of diphtheria in the Camps in 1895, to its maintenance there in epidemic form during 1896, and to its seeming transference as an epidemic from the Camps to the Town during 1897, cannot now be determined. Too many of the data essential for a definite judgment on the subject are unrecorded, and cannot after lapse of several years be recovered. All that remains to be done is to contrast the behaviour of the disease in recent years, 1897, 1898, and early 1899, of diphtheria in Camp and Town, with a view of ascertaining, if it be possible, what have been the agencies mainly responsible since 1896 for maintenance and spread of the disease in the one and the other locality.

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march, in changing barracks, &c. Such cases not having their origin in the Camps of Aldershot, are in all cases eliminated from this report. Also, where cases of diphtheria have occurred in the families of soldiers resident in the Town, and were notified there (and appear to have been contracted in the Town), they have been, in Table D, included in the Town list of cases, even though they have been removed to the Military Isolation Hospital for treatment, and have in instances died there.

† In the Town the cases are given under the calendar month in which they occurred for each year here shown.

‡ The cases are given in the Official Returns, which are compiled from Friday to Friday, as occurring in the 1st, 2nd, 3rd, &c., &c., week of the year, and therefore are only approximately correct as to the exact month under which they are entered in this Table as far as regards the years 1895 and 1896.

§ For the years 1897 and 1898, the cases recorded are shown as they occurred in each calendar month in the Camps.

And, first, as regards diphtheria mortality :—

Diphtheria Deaths in the Town in 1897–99.—On the basis of the Census data for the South Camp and Town for 1891, the estimated total population for the Town in 1898 comprised persons at ages as follows :—

0 to 3 years	1,697
3 „ 15 „	4,621
Over 15 „	10,182
	16,500

These numbers, checked against the actual number of children attending the Public Elementary Schools, would tend to show that the number as estimated is above the actual number of children living in Aldershot, even when allowance has been made for children between 13 and 15 years of age (13 years being the school limit for compulsory attendance), and for the number attending the private schools. The rates derived from using these figures will, in consequence, always tend rather to understate than overstate the amount of diphtheria which has prevailed among children.

From Table J in Appendix, Table F has been constructed, showing for the Town of Aldershot the mean annual diphtheria death-rate per 1,000 living at each of several age groups, for each sex, in the period 1st January, 1897, to 28th February, 1899.

TABLE F, showing for the period 1st January, 1897, to 28th February, 1899, the Annual Diphtheria Death-rate per 1,000 persons living at each age group, and for both sexes, in the Town of Aldershot.

Age Groups.	Number of Diphtheria Deaths.			Reduced to Annual Diphtheria Death Rates per 1,000 living at each Age Group.		
	Males.	Females.	Both Sexes.	Male.	Female.	Both Sexes.
Under 3 years ...	8	9	17	4·35	4·89	4·62
3 to 15 „ ...	23	17	40	4·59	3·40	3·99
Over 15 „ ...	1	2	3	0·09	0·18	0·14
Totals, at all ages	32	28	60	1·81	1·55	1·68

From this Table it is seen that although in the Town the mortality rate from diphtheria in children 0–3 years exceeded that in children 3–15 years, yet children of school attendance age furnished by far the larger proportion of diphtheria deaths.

Diphtheria Deaths in the Camp in 1897–99.—It has not been found possible, as regards diphtheria in 1897, 1898, and 1899, to construct for the Appendix a table for the Camps similar to Table J given for the Town, owing to the fact that the sex of children and infants has not always been recorded in the official returns. A table (Table K) has, however, been constructed, in which the cases occurring among children under 15 years have been referred to their age groups, and over that age to their respective sex. But, as regards such cases as have ended fatally, the missing data have in each instance been extracted from the local death registers. Thus, for comparison with Table F for the Town, a similar table (Table G), for the camps has been constructed, showing the annual diphtheria death-rate per 1,000 living at each age group and of each sex.

TABLE G, showing for the period 1st January, 1897, to 28th February, 1899, the Annual Diphtheria Death-Rate per 1,000 Persons living, and for both Sexes, in the Camps of Aldershot*.

Age Groups.	Number of Diphtheria Deaths.			Reduced to an Annual Diphtheria Death Rate per 1,000 living at each Age Group.		
	Males.	Females.	Both Sexes.	Males.	Females.	Both Sexes.
Under 3 years ...	0	1	1	0·0	1·60	0·80
3 to 15 „ ...	8	7	15	4·74	4·15	4·45
Over 15 „ ...	2	0	2	0·06	0·0	0·05
Total	10	8	18	0·26	1·55	0·42

From Table G it is seen that in the Camps, since 1896, children of school attendance age have not only the highest diphtheria death-rate of the age groups recorded, but that this rate is higher than the corresponding rate for the Town. For the other age groups diphtheria death-rates for the Camps are lower than the corresponding rates for the Town.

Secondly, as regards diphtheria attack :—

Diphtheria Attacks in the Town in 1897–99.—From Table J in Appendix the ATTACKS of recognised diphtheria in the Town, which can be referred to their age groups and sex, furnish (Table H) the following figures as a *Mean Annual Attack-Rate* calculated from 1st January, 1897, to 28th February, 1899.

* In Aldershot Camps the average strength for the years 1897 and 1898 was as follows :—

Year.	——	Men.	Women.	Children.
1897	South Camp	11,513	1,043	1,722
	North „	5,070	261	434
	Total	16,583	1,304	2,156
1898	South Camp	11,299	1,007	1,588
	North „	4,825	311	525
	Total	16,124	1,318	2,113
Average for the two years		16,353	1,316	2,134

At the Census of 1891, the proportion of children living in the age-period 0–3 years, bore to the children 3–15 years the proportion of 1 : 2·7, and the numbers were equally divided between males and females. Therefore—

Children 0–3 years = 288·5 males and 288·5 females; and
„ 3–15 „ = 778·5 „ „ 778·5 „

In all official returns of the Camps the numbers of non-commissioned officers and private soldiers only are returned as "men," the "officers" not being included. The number of officers in the Camps varies between 500 and 600.

TABLE H, showing for the period 1st January, 1897, to 28th February, 1899, the Annual Diphtheria *Attack-Rate* per 1,000 persons living in each Age Group, and for both Sexes, in the Town of Aldershot.

Age Groups.	Cases of Known Diphtheria or Membranous Croup.			Reduced to Annual Attack Rates per 1,000 living at each Age Group.		
	Males.	Females.	Both Sexes.	Males.	Females.	Both Sexes.
0 to 3 years ...	24	27	51	13·28	14·94	14·11
3 to 15 „ ...	100	104	204	20·31	21·13	20·72
Over 15 „ ...	11	19	30	1·01	1·75	1·38
Total, all ages ...	135	150	285	7·68	8·53	8·11

The table shows that of the known diphtheria cases, not only did the greatest number occur in children of school attendance age, but that the attack-rate was greatest at that age. On the whole, and at each group of ages, females suffered more than males.

Diphtheria Attacks in the Camps in 1897–99.—From Table K in the Appendix giving the ATTACKS of recognised diphtheria in the Camps, a table (Table I) has been prepared to show the *Mean Annual Attack-Rate* per 1,000 persons for the period 1st January, 1897, to 28th February, 1899. For the reason already stated, it has not been possible to allot the cases under 15 years of age to their respective sex and age groups.

TABLE I, showing for the period 1st January, 1897, to 28th February, 1899, the mean Annual Diphtheria *Attack-Rate* per 1,000 persons living in each age group, and for both sexes over 15 years of age, in the Camps of Aldershot.

Age Group.	Cases of known Diphtheria or Membranous Croup.			Reduced to an Annual Attack Rate per 1,000 living at each Age Group recorded.		
	Males.	Females.	Both Sexes.	Males.	Females.	Both Sexes.
0 to 3 years ...	—	—	15	—	—	12·00
3 „ 15 „ ...	—	—	75	—	—	22·23
Over 15 „ ...	21	2	23	·59	·70	0·60
Total, all ages...	—	—	113	—	—	2·63

This table shows, for so far as it goes, that during the period in question the attack-rate was less in the Camps than in the Town, in every instance except that for children of school attendance age, it which case it was somewhat greater in the Camps than in the Town.

40. *Considerations on, and Comparison of, the Sanitary Administration in the Town and in the Camps with reference to Diphtheria prevalence.*—Surgeon-General O'Dwyer became Principal Medical Officer in September, 1896. Sanitary administration forms only one item of the many duties of the "Principal Medical Officer," and Surgeon-General O'Dwyer received assistance to enable him to deal more effectively with such matters by the appointment of Captain Hughes, in 1897.

Also, in 1896, the Military Isolation Hospital had been erected in the South Camp, and additional ward accommodation was from time to time provided there ; a Recks steam disinfector added. A small analytical laboratory, which has existed for some years, was in January, 1898, efficiently equipped for bacteriological work at the Cambridge Hospital, and this enabled the method of dealing with infectious disease, and especially with diphtheria, to be further elaborated.

It is of interest to note that the attack-rate for the Camps recorded for each age-group during the year 1898 is in every instance less than the corresponding rates shown for the Town ; nevertheless, they are in every instance higher than the mean attack-rates for the Camp during the period 1891–94, *i.e.*, antecedent to the great outburst of 1895. It is also to be noted that the decrease of diphtheria in the Camps has to a very great extent taken place in persons over the age of childhood, and that children in the Camps show for the year 1898 an attack-rate three times as great as the mean attack-rate for 1891–94 for the corresponding age period.

In the Town there was no isolation accommodation, disinfection was perfunctory, and the District Council, strengthened by the presence of Surgeon-General O'Dwyer as one of the members nominated by the Secretary of State for War, was only beginning to deal with cases of infectious disease in a comprehensive manner at a time when the attack-rate per 1,000 of the whole population by diphtheria had been steadily rising for six years, and had reached a rate of 2·99 per 1,000 in 1896 : the mean rate for the six years 1891 to 1896 being 1·78. In 1897 the rate rose suddenly to 7·90 per 1,000, and in 1898 further increased to 9·39. As has been already observed, it would seem that the great outburst of 1895–96 in the Camps had in some sense had its sequel in the Town.

It is impossible to state what, in the Camps, was the respective share towards the lessening of diphtheria prevalence in 1896 exercised by the careful revision of preventive measures and by the movement of the troops from the Camps to the autumn manœuvres. The fact remains that diphtheria practically ceased among the soldiers, although it continued to attack their children.

It has been noted that a small outbreak of diphtheria occurred among the Army children at a time when the Army Schools were closed for the summer vacation (section 37 of this Report). I am informed that the Army Medical Officers are of opinion that, as a preventive measure against the spread of an infectious disease such as diphtheria, the efficacy of school closure in limiting outbreaks of infectious disease among the civil population fails when applied to Army Schools.

The autocratic power possessed by the military authorities in dealing with infected quarters and their occupants can never be possessed by the civil power. It, however, remains to be seen whether, by prompt recognition and notification of cases of diphtheria, the immediate isolation of such sick in the Isolation Hospital as cannot be effectively isolated in their own homes, the free use of a reliable disinfecting apparatus, the more efficient disinfection of invaded houses, and perhaps an increase or alteration in the sanitary staff, the Town will not be able to limit, if not eradicate, the prevalent diphtheria.

I have to express my sense of gratitude for assistance rendered, and my appreciation of the courtesy extended to me, by the officials of the War Department and the Medical Staff of the Headquarter Offices at Aldershot ; by Colonel Jones, V.C., by Mr. A. H. Smith and other members, and the officers of the Urban District Council ; by the Superintendent Registrars of the Farnham and the Hartley Wintney Registration Districts for examining and extracting entries of the Death Registers in their keeping, and also by the local Registrars of Aldershot and Farnborough ; by certain members of the medical and veterinary professions ; by the Chairman and Secretary of the Aldershot Gas and Water Company ; and by numerous other persons.

RICHARD J. REECE.

8th July, 1899.