

Dr. Parsons's report to the Local Government Board on an outbreak of diphtheria at Camberley and York Town, in the parish of Frimley, in the Farnham rural sanitary district / [H. Franklin Parsons].

Contributors

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**Dr. Parsons's Report to the Local Government Board on
 an Outbreak of Diphtheria at Camberley and York
 Town, in the Parish of Frimley, in the Farnham Rural
 Sanitary District.**

GEORGE BUCHANAN,
 Medical Department,
 March 15th, 1889.

General description.

THIS inspection was directed by the Board at the request of the Farnham Rural Sanitary Authority, and was made in January 1889.

Camberley and York Town are two contiguous places of modern growth and semi-urban character, in the northern part of the parish of Frimley, on the London and Exeter high road. On the north-west side of the London road are the church and schools and the grounds of the Royal Military and Staff Colleges, the houses in Camberley and York Town being ranged along the south-east side of the London road, in by-roads and streets. The population is estimated at about 4,000, rather more than half of this number living in Camberley, rather less than half in York Town. Both places have close relations with the military colleges. Among the well-to-do inhabitants are many officers, acting and retired, and many of the cottages are occupied by college servants; there are also the usual professional men, tradesmen, and artisans.

Previous history of diphtheria.

The surface of the ground is somewhat undulating with a general fall to the south-west, on which side the River Blackwater, a sluggish stream flowing through low-lying marshy meadows, forms the boundary of the district. The soil consists of sand and gravel with layers of more retentive material, belonging to the upper and middle Bagshot beds; the top soil being peaty. The surface in its natural state is covered with pine woods and heather, or forms wet sandy commons.

In October 1886 Camberley and York Town were visited by a sudden and severe outbreak of diphtheria, almost confined to households of the well-to-do class. This was reported on in the following year by Mr. Power, who showed that it had its origin in infected milk distributed from a particular dairy; though in what way the milk became infected could not be ascertained.

Since this outbreak, which rapidly subsided when the supply of infected milk was discontinued, Camberley and York Town seem to have been tolerably free from diphtheria or other throat illness until the autumn of 1888. There was a fatal case of diphtheria at York Town in the early part of 1888, supposed to have been contracted by exposure to the stench from a sewage-polluted pond; there were also one death from croup and three from "laryngismus stridulus," but the latest of these was in April 1888. A few cases of sore throat among paupers appear in August and September 1888 in the medical relief book; one of them in a family in which diphtheria afterwards occurred. (Dr. Manders, district medical officer, tells me that this was a case of enlarged tonsils, an ailment to which the whole of the family are liable, some of them having had the tonsils partially removed.) So far as I can learn, however, there does not appear to have been any marked prevalence of sore throat prior to or during the time of the prevalence of diphtheria.

First case in York Town, Sept. 1888.

The earliest case recognised as diphtheria last autumn was a child, F. H. B., of York Town, who was taken ill on September 27th and died on September 28th. The child, who was not quite three years old, did not go to school, and no history of exposure to infection could be made out. The father was a servant (mess waiter) at the Royal Military College, and there had been a previous case of diphtheria in the family of another college servant living at Owlsmoor, in the parish of Sandhurst, in the Easthampstead District, but the two men were employed in different parts of the college, and neither they nor their families were accustomed to meet. B.'s house is old and damp, and at that time there was in the wash-house an old untrapped drain containing offensive matter. This state of things had been altered before my visit, but Dr. Maunsell, of the Royal Military College, who had

been in attendance, was inclined to look upon it as the source of the mischief. The two younger children of the B. family and their father were subsequently attacked with diphtheria, but recovered.

Diphtheria had previously existed in the adjoining districts.

In adjoining
districts.

I learn from Dr. Woodforde, medical officer of health for Berkshire, that in the parish of Sandhurst nine families are known to have been attacked between September and December last, viz., four in Sandhurst village, two in outlying hamlets, and three, later, in the grounds of the Royal Military College. There were seven deaths, two of them, however, being registered as from "croup" and "bronchitis" respectively, though shown by subsequent events to have been probably from diphtheria. Two households, viz., the one at Owlsmoor, and one in Sandhurst village, were attacked in September, four in October, two in November, and one in December. The first case, that at Owlsmoor, Dr. Woodforde thought might have been caused by the boy drinking water from a streamlet fouled by the sewage from Broadmoor Criminal Lunatic Asylum; the subsequent cases of the disease in Sandhurst he attributes to infection spread among children attending a school at Sandhurst of which the sanitary arrangements were very unsatisfactory. Except possibly in the case of the girl F. mentioned on page 4, I did not find any channel by which infection might have been brought from Sandhurst to Camberley or York Town.

Mr. Denny of Blackwater, medical officer of health for the Hartley Wintney rural district, informs me that there were in October a few cases of diphtheria in two households at Hawley near Blackwater, but does not think that diphtheria could have been conveyed from them to York Town or Camberley.

Outbreak in
Nov. 1888.

No other cases of diphtheria are known to have occurred in York Town or Camberley during October, but in the early part of November several families were attacked within a few days of each other, and others followed, keeping up a succession throughout November and December almost up to the time of my visit (January 12th-19th).

Up to that date the number of cases had been as follows, so far as I could learn from the officers of the sanitary authority and from the local medical men, who kindly gave me information as to the cases under their care:—

In Weeks ending	Families invaded.	Subsequent Cases in such Families.	Total Cases in those Families.	Deaths among such Cases.
September 29, 1888	1	3	4	1
November 10 " "	4	3	7	4
" 17 " "	6	18	24	9
" 24 " "	2	1	3	1
December 1 " "	1	1	2	—
" 8 " "	1	1	2	1
" 15 " "	6	4	10	1
" 22 " "	1	2	3	1
" 29 " "	2	1	3	—
January 5, 1889	1	—	1	1
" 12 " "	1	—	1	—
Total	26	34	60	19

There is a little discrepancy in several cases between the dates of commencement as obtained from different sources, partly according as the date given is that of the appearance of the first symptoms of ill-health, or of the characteristic symptoms of diphtheria. In two households, the invasion commenced by two children being taken ill almost simultaneously. Of the first four cases in November the approximate dates of commencement were November 4th, 6th, 9th, and 10th. They occurred, two in Obelisk Street, Camberley; one in Princess Street, Camberley, not far off; and the fourth in a distant part of York Town. One of the children attended the Roman Catholic school in Obelisk Street, Camberley; two had brothers or sisters attending that school, but did not go to school themselves; and one attended the York Town Board School, the family having no connexion with the Roman Catholic School. Milk and water were in each case obtained from a different source.

Of the six households invaded in the following week, four were in Camberley, one at the Camberley end of York Town, and the other at the lower end of York Town, a mile distant; and they were under diverse circumstances of school



attendance, milk supply, and water supply. In one of the households two sisters, one attending school and one not, were taken ill on the same day, there having been no previous sickness in the family, so far as could be ascertained.

Towards the end of November and the beginning of December the number of households newly attacked fell off, but it increased again in the middle of December. In this later part of the period the disease presented some differences of behaviour from its earlier course; its extension from household to household was more obviously due to personal intercommunication, but it tended less to spread within the family, and the proportion of deaths was less. A curious circumstance, which I have noticed in some other outbreaks, is the much greater mortality among those members of the family who were first attacked than among the subsequent cases. In the families invaded, 13 out of 28 initial cases* died, whereas among 32 subsequent cases there were only six deaths. Whether this difference be due to the persons most susceptible of the disease being the first to be attacked, or to medical attendance having been more promptly called in to the later cases, with the result of averting a fatal issue, or to the earlier cases when mild not having been recognised as diphtheria, I cannot say.

Incidence on working class.

In its incidence upon persons of different social classes the present outbreak of diphtheria presents a strong contrast to that reported on by Mr. Power. In that case households of the well-to-do class, *i.e.*, large consumers of milk, were especially attacked. On the present occasion all the households attacked, with the exception of two tradesmen's, were those of persons of the cottager class—college servants, artisans, and labourers.

The following table shows the incidence of the disease as regards age and sex :—

As regards age and sex.

Age.	Initial Cases.*		Subsequent Cases.		Total.		Grand Total.
	Males.	Females.	Males.	Females.	Males.	Females.	
Under 1 - - - -	—	—	1	—	1	—	1
1-5 - - - -	4	6	6	2	10	8	18
5-15 - - - -	10	5	7	6	17	11	28
15 and upwards - -	1	2	3	7	4	9	13
Totals - - - -	15	13	17	15	32	28	60

The bulk of the sufferers were thus children, especially children of school-going age. There were rather more males than females, except among adults; women having contracted the disease more frequently than men, no doubt owing to their being brought oftener into contact with infection in nursing patients. The deaths occurred at the following ages :—

Age.	Males.	Females.	Total.
1-5 - - - -	5	7	12
5-15 - - - -	4	2	6
34 - - - -	—	1	1
Total - - - -	9	10	19

Cause undetermined.

In looking for the cause of the outbreak of diphtheria in November 1888, we seem to require, in order to explain the first dissemination of the disease, some condition or combination of circumstances first coming into operation about the beginning of November, and acting in a scattered fashion over a somewhat wide area, though exhibiting a preference for certain localities, and confined in its operation to persons of the poorer or lower middle class. Such a condition I have not been able to find; possibly it may have escaped notice, or have been of a nature as yet unsuspected, or possibly different causes may have been concerned in different cases.

It will be necessary for us to consider the various circumstances known or suspected to stand in a causal relation to diphtheria, in order to ascertain how far each may have had a share in the result.

* In the two households in each of which two children were taken ill on the same day, both cases are reckoned as initial ones. The number of initial cases is thus greater by two than that of the households invaded.

Infection.

Infection through personal communication has no doubt had a large share in the later spreading of the disease, both from one member to another in the families invaded, and also, in the later part of the period, from one household to another. I have not, however, been able to trace any channel through which the first diffusion of the disease may have been thus brought about.

The first two cases of diphtheria in November occurred in Obelisk Street, Camberley. The grandmother of the child F. H. B. who died at York Town on September 28th lives in this street; she had helped to nurse the child, and after its death had returned home. This, however, was early in October, a month before the outbreak, and I could not learn that there had been any communication between her and subsequent sufferers.

School attendance.

The first recognised case in Obelisk Street (which commenced on November 4th) was a boy who attended the Roman Catholic schools in that street, and it has been suggested that the attendance of children at that school may have had to do with the spread of the disease. I find that a girl F. F. residing in a wooden hut in the grounds of the Royal Military College in the parish of Sandhurst,* but attending the above school, was taken ill towards the end of October with symptoms of a cold, weakness, and bleeding from the nose, but was not seen by a doctor until November 6th, when she was found to have diphtheritic patches on her tonsils. Other members of the family were taken ill later (two on November 6th), and two died. F. F. was last at school on October 19th, but others of the family attended up to October 26th. In another family in Camberley, in which there were afterwards seven cases of diphtheria and two deaths, a boy attending the Roman Catholic school had previously had sore throat, and was away from school for some days; he was last at school November 2nd and returned November 8th. He is a strumous boy liable to sore throat, having enlarged glands in the neck. Through some such case it was thought that diphtheria might unsuspected have been present in the school. On the school premises is a pump used for flushing purposes: the well supplying this is near a stable and cesspool, and the water is considered to be unfit for drinking; but as to whether or not it was ever drunk by the children there is a conflict of testimony. In any case I do not think that there is much evidence to connect the Roman Catholic school with the spread of diphtheria. Of 26 households invaded, in 16 the first patient was under or above school-going age or had not attended school for a week or more before his illness commenced (though in five of these, invaded between November 6th and 18th, other members of the family had been attending the Roman Catholic school); in six the first patient attended the York Town Board School (two of them, however, only on the morning of the day on which they were taken ill, the schools having been closed during the fortnight previous); and in the remaining four, the Roman Catholic school (in one of these cases another child in the same house who did not attend school being taken ill the same day).†

The Roman Catholic school is attended on week days by many of the younger children, Protestant as well as Catholic, in Camberley.

The Roman Catholic school was closed November 17th to December 10th inclusive; it was re-opened December 11th and 12th, and then closed again, re-opening January 17th. The Board school was closed November 24th to December 10th; was open December 11th to 14th, and was then closed again, re-opening January 17th.

Several of the children attacked in the week ended November 17th had been to Blackwater Fair—November 8th and 9th—and may possibly have come in contact with infection there; but two of the cases had then already begun. The fair was not followed by any development of diphtheria in the Blackwater district.

Milk supply.

Milk supply.—The milk supply of the affected families was obtained from a variety of sources. As a general rule but a small quantity, half a pint or so once or twice daily, was used before the illness; some households used none at all, and others condensed milk only. Milk, therefore, as a cause, may be excluded. The results of inquiries as to meat, bread, and groceries were similarly diverse.

* She had been on two or three occasions in October (dates uncertain) to a shop at Sandhurst, at which there was a case of diphtheria in the latter part of that month (commencing Oct. 23rd).

† It is of course conceivable that infection may have been brought from the school to their homes, by children who did not themselves suffer from diphtheria, or who had it only in a latent or unrecognised form; but even on this supposition it would hardly be expected that the children who did not attend the school should have suffered in larger number than those who did.

Diseases of
lower
animals.

Diseases of Lower Animals.—Inquiries were made on this point, but without finding anything to show that the diphtheria among human beings had had such an origin.

The following circumstances, however, were told me:—

A little girl who died of diphtheria used to fondle the next door neighbour's cat. Shortly after her illness commenced, the cat fell ill with fits and vomiting; it was at once killed, but no examination was made of its body.

Dr. Maunsell informs me that a neighbour of his, who had a valuable flock of carrier pigeons, lost a number of them in June 1888 from "canker," a disease marked by the formation of a diphtheria-like membrane about the birds' mouths and throats. Under Dr. Maunsell's advice he treated them with tincture of iron internally and locally, and cleansed and limewashed their cote, after which the disease subsided. Their dung was thrown on a dung-hill on which Dr. Maunsell's fowls used to scratch, and in November three of the fowls died; their bodies were unfortunately not examined. The pigeons were all sent away in July, but Dr. Maunsell thinks that the old dung may have been exposed by the removal of the top layers.

Meteoro-
logical con-
ditions.

Meteorological Conditions.—It appears from the meteorological observations taken by the Astronomer Royal at Greenwich, and published in the weekly returns of the Registrar General, that towards the end of October there was a conspicuous change of atmospheric conditions. In the earlier part of October the weather was cold and dry; during the 25 days ending October 24th the mean daily temperature was continuously below the average, the average daily deficit being 8·5° F.; the wind during the same period was variable in direction and small in amount, the horizontal movement of the air being only three-fourths of the average: rain fell on three days only, and to an aggregate amount of only 0·13 inch. Mild damp weather then set in; in the 10 days October 25th—November 3rd, the mean daily temperature was 4·9° daily above the average, and rain fell on six days to an aggregate amount of 2·68 inches. Mild moist weather continued through November, the mean temperature of that month being 4·5° F. above the average. The weather at Camberley at the time when the diphtheria broke out is said to have been foggy. Whether these conditions had to do with the outbreak of diphtheria it is difficult to say; in London the deaths from diphtheria have been in excess of the average from September to December, through both the cold and dry, and the mild and moist period.

*Sanitary
Conditions.*

Sanitary
state of
dwellings
and their
surround-
ings.

Dwellings and their Surroundings.—Nearly all the cases of diphtheria have occurred in houses in damp situations. In Obelisk Street and Princess Street, Camberley, the roadways are, or were at that time, unmade, the surface being a filthy quagmire; they have since been partially put into repair. The soil is damp, in places quite boggy, and the water-level in wells is but little below the surface. Pembroke Cottages, near the bottom of Princess Street, form a row of eight concrete cottages, a good deal out of repair. They have no through ventilation, and the floors are almost below the level of the ground. There have been cases of diphtheria in five out of the eight houses, but there were abundant opportunities for the spread of the disease by personal intercommunication between the inmates of different houses. Another group of cases occurred in a low-lying situation near Appley Place, at the Camberley end of York Town, and another again in some new rows of houses in the low meadows off the Frimley Road. Several of the houses invaded were also damp through defective eave-spouting. The houses invaded were for the most part comparatively modern cottages, semi-detached or in rows. The interiors of some were not as clean as they should be; in other cases there was no fault to be found in this respect. They have mostly a good piece of garden ground attached. Accumulations of manure were rarely noticed.

Exhalations
from river
mud.

Exhalations from River Mud.—Mr. Denny informs me that the bed of the River Blackwater was cleared out last autumn shortly before the diphtheria appeared, and a quantity of weeds and sludge removed. It had similarly been cleared shortly before the outbreak of diphtheria in October 1886, and Mr. Power, in his report on this outbreak (page 4), mentions that on a former occasion similar river cleansing operations were followed by an outbreak of diphtheria in their neighbourhood. Probably, however, the connexion is merely one of coincidence. The river is cleansed at the time of year when the water is lowest, *i.e.*, at the end of summer, and outbreaks of diphtheria most frequently commence in autumn.

In the present outbreak, as in that reported on by Mr. Power, there has been no special incidence of diphtheria upon houses nearest the river. In the houses in the lower part of York Town, near Blackwater Bridge, there was only one case of diphtheria (commencing November 13th); whereas the greater number of houses invaded were at Camberley, a mile away from the river, with intervening rising ground.

Sewerage.

Sewerage.—Camberley and York Town have been sewered about four years; the sewers discharge by two outfalls on a piece of irrigation ground in the low ground near the Blackwater. The sewers are of pipes, and are intended to convey only sewage and (in part) roof-water, road-water and sub-soil water being excluded, though a good deal of the latter finds its way into the sewer in Princess Street. The joints of the Obelisk Street sewer, which was open at the time of my visit, were imperfectly made and leaky. The sewers are ventilated by tall shafts, and by grids at the street level; from some of the latter, offensive smell is complained of, especially from one at the bottom of Obelisk Street. There is a flushing tank, filled by pumping from a well, at the upper end of the sewer system in the London road, and the water can be diverted so as to flush the sewers in some of the side streets; other branch sewers which cannot be reached in this way are flushed from a barrel. In some of the cases of diphtheria there was a history of exposure to sewer effluvia shortly before, but the cases did not follow especially the course of any particular sewer, and some occurred in houses not drained into the sewers. The inlets of the house drains are as a rule out of doors, the sink pipe discharging over a trapped gully. The sink pipe itself is often untrapped, and hence any foul smell arising from the fur with which it is apt to get coated, especially when of any considerable length, or of wide calibre, is able to enter the house. The closets at cottages are usually hopper-closets connected with the drains; they have no water laid on to them, and are supposed to be flushed by pouring down water by hand; the quantity of water thus used is, however, often insufficient to keep the drains clean.

Water supply.

Water Supply.—There is no public water service, the inhabitants being dependent upon wells, which are shallow or of moderate depth, some mere surface dipping holes. The supply is not only insufficient, as already mentioned, for drain flushing, but is also of inferior quality, the water of some of the wells having an unpleasant taste due to iron and peat in the soil. Many of the wells, too, are insufficiently protected against the entrance of surface impurities. The different persons attacked with diphtheria had, however, obtained their water from a number of different sources, and there was no evidence to connect the outbreak with any particular source.

I am informed by the Clerk that the Rural Sanitary Authority find a difficulty in providing a public supply for Camberley and York Town, owing to these places being within the district of the Woking Water Company, who claim a monopoly, but refuse to lay on a supply except for a guaranteed payment of 1,500*l.* a year, a sum which the Authority consider too large.

Action of sanitary authority.

The measures taken under the direction of the Rural Sanitary Authority to arrest the outbreak have included the closing of the schools as aforesaid, and such measures of home isolation as were practicable, the flushing of drains with disinfectants, and the fumigation with sulphur of infected houses when the illness was over. The Rural Sanitary Authority have no hospital for the isolation of cases of infectious disease; and though such partial isolation as was practicable in households where a separate room could be allotted to the sick person, apparently helped to stay the spread of the disease; in cottages inhabited by a large family even such imperfect isolation could not be obtained, and in several such households there were long series of cases. In other instances the unaffected members of the family were sent away on the breaking out of diphtheria, with the result, in some cases, of their escaping, but in others of the disease being introduced into other households. In one or two instances diphtheria recurred in a house after it had been fumigated; but in these I found that the fumigation had been imperfectly carried out, owing to the family having nowhere to go to meanwhile, and that subsequent measures of cleansing and limewashing had been neglected.

The Farnham Rural Sanitary Authority have certain urban powers within the parish of Frimley (which includes Camberley and York Town), and have made byelaws with respect to the removal of house refuse, to the prevention of nuisances,

to common lodging-houses, and to new streets and buildings. They have appointed a surveyor to look after the sewers, and to see that the byelaws are properly carried out; but I found that at some new houses the drains were not provided with means of ventilation as required by the byelaws. The Rural Sanitary Authority have appointed a parochial committee to look after the affairs of Frimley parish under their control. It is thought, however, by many of the inhabitants, that it would be preferable to have a separate authority elected for the parish, especially as Farnham, where the Rural Authority meet, is inconveniently remote. Several unsuccessful attempts have been made to get a local board formed, and the question now stands over to be dealt with by the Surrey County Council.

H. FRANKLIN PARSONS.

February 9th, 1889.
