

**Dr. Parsons's report to the Local Government Board on a re-inspection of the sanitary condition of the Godmanchester Urban District, with especial reference to the prevalence of diphtheria there in 1883 / [H. Franklin Parsons].**

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Dr. Parsons's Report to the Local Government Board on a Re-inspection of the Godmanchester Urban District, with especial reference to the Prevalence of Diphtheria there in 1883.

GEORGE BUCHANAN,  
Medical Department,  
October 2, 1884.

THE borough of Godmanchester is contiguous to that of Huntingdon; the river Ouse, crossed here by a bridge, forming the boundary between the two. The two places together form the parliamentary borough of Huntingdon, but for municipal purposes they are distinct. Though possessing the dignity of a corporate town, Godmanchester is a mere agricultural village, of 2,188 persons in 1881, having declined from 2,363 at the previous census. The population consists principally of farm labourers.

Entering Godmanchester from Huntingdon, we find, just across the bridge, two or three rows of cottages—Bridge Place and Adelaide Terrace. Here also are the railway station and some mills. Following the high road, which crosses some marshy meadows, we come to the most populous part of the borough, which lies about half a mile south of the bridge, and consists of a compact nucleus of radiating streets connected by cross lanes. The whole town stands on a marshy site but little elevated above the adjacent river, by which, in wet weather, it is liable to be flooded. The subsoil is river gravel above Oxford clay.

The cottages are, many of them, old and dilapidated, built of mud, with thatch roofs. Overcrowding is frequent.

Godmanchester, with other parts of the Huntingdon registration district, was inspected by me in August 1880, on account of the prevalence of scarlet fever. The following is the précis of my Report made after that visit:—"A mere village, in a low-lying damp situation, subject to floods. Cottages old, dilapidated, ill-ventilated, and overcrowded. Sewers of defective construction. Water-supply from shallow wells liable to pollution; some houses unsupplied. Offensive midden and cesspit privies very close to houses. Great accumulations of filth. No proceedings taken for the abatement of nuisances. No public scavenging, byelaws, or hospital accommodation." To this Report were appended certain recommendations from the Board towards remedying the defects mentioned. These recommendations are reproduced as an Appendix (I.) to the present Report, being equally applicable now, since, as will be seen from the following account, the Town Council have taken no steps whatever towards remedying the unwholesome conditions previously described.

The only alterations in this respect are, that through the decline of the population some of the oldest and most dilapidated houses have become vacant, and that eaves-spouts have been put to many of the roofs. The latter are an improvement in keeping the walls dry, but unless the fall pipes are disconnected from the sewers (which they are not in all cases) they introduce a source of danger in another way, by delivering sewer air just below the bedroom windows; most of the cottages in Godmanchester having windows in the roof.

The sewers in Godmanchester are of common agricultural pipes 10 inches in diameter. They have very little fall, and at the time of my visit the mouth of the sewer was standing half full of water. Part of the system can be flushed from the river, the water being allowed to run through the sewer in a continual stream; other sewers are flushed by a water-cart. The principal outfall is into a semi-stagnant ditch, full of black stinking sediment. Stoppages in the sewers are frequent, owing to the liquid portion of the sewage leaking out at the open joints and leaving the sediment behind.

So far are the Town Council from appreciating the proper principles of sewer construction, that when recently it was found necessary to take up the sewer in East Chadley Lane, which was choked with sediment, and was found to have been laid with a fall the wrong way, it was relaid with the same unjointed pipes, and three catchpits were made in its course to retain the sediment.

Previous inspection.

House accommodation.

Sewers.

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The house drains are, except in size, of similar construction to the sewers. One of them was seen uncovered; it was full of black foetid sediment, and the earth was sodden around the joints. It was being relaid partly with socket pipes, but some of the pipes were turned the wrong way, with the socket end downwards. The inlets to the drains are commonly roughly made and untrapped; but they are, as a rule, outside the houses, although often close to the doors. Offensive effluvia from sewers and drains are very prevalent.

Privies.

No action has been taken by the Town Council towards introducing a better system for the disposal of excrement; and, except in one or two instances, where owners or occupiers have of their own accord adopted improved arrangements, the offensive midden and cesspit privies remain, even when close to houses, as they were at the time of my former visit.

The Corporation have purchased a cart, which is lent out for scavenging purposes; but householders have to find horse and labour for themselves, which in harvest time it is difficult to do. On the whole, however, accumulations of refuse were not so prominent a feature as at the time of my former visit.

Water supply.

The water supply of Godmanchester is obtained solely from shallow wells sunk in the gravel bed on which the town stands. As this gravel bed has been during a long period contaminated by the soakage from leaky sewers, cesspits, and other collections of filth, often placed close to the wells, the water which it yields must consist in considerable proportion of more or less filtered sewage, especially in a dry season like the present, when the low level of the ground water favours leakage into the subsoil. In one yard (Bodger's Yard, Duck End,) the pump stands against the cesspit-privy, the well being stated to be nearly under it. In another narrow yard, there is a large middenstead, measuring 8 by 12 feet, full of stable manure, only six feet distant from the well; and the ground being open at the time of my visit, the passage of the brown manure water through the gravelly soil towards the well could be seen. The water of the wells, though usually clear, has often a yellowish hue, a mawkish or nauseous taste, and sometimes a foetid smell. As a further test the amount of chlorine in the water of ten wells was determined volumetrically as follows:—

No.	Position of Well.	Chlorine, grs. per gallon.	Remarks.
1	Adelaide Terrace - - -	3·4	See Appendix II. Well in open mill yard.
2	Bridge Place - - -	6·0	Mawkish taste. Privies 12 ft. from pump.
3	Avenue Terrace - - -	2·5	Well at outlying row of houses, but privy near.
4	East Chadley Lane - - -	6·9	Privy 12 ft. off.
5	Fairy's - - -	10·3	Water yellow; well 10-12 ft. from stable, leaky drain, and deep privy vault.
6	Gibbins, Duck End - - -	9·0	Well 9 ft. from privy.
7	Thackray's Yard, Duck End - - -	6·0	Nauseous smell and taste. Privy 10 ft. off.
8	Piper's Lane - - -	13·0	New well; probably near leaky sewer.
9	Bodger's Yard, Duck End - - -	12·0	Mawkish taste; well nearly under privy.
10	Offord Road - - -	2·0	Outlying farm-house.

The significance of these figures has to be explained. Chlorine is one of the two constituents of common salt (chloride of sodium), in which form it chiefly occurs in nature. Except in the neighbourhood of the sea, and in certain districts, as Worcestershire and Cheshire, in which particular salt-bearing strata occur, the soil is usually nearly free from common salt or other chloride, and hence but a very small proportion is found in good well or spring water, the amount of chlorine in such water commonly not much exceeding one grain per gallon and rarely exceeding two grains. Common salt is, however, largely used in all households, and, being very soluble, passes to waste in the liquid form, partly in human excretions, partly in waste water. Hence, in an inland and not salt-bearing district, the proportion of chlorine, *i.e.*, of common salt, in a well water, may usually be taken as forming a rough measure of the degree in which that water has become contaminated by liquid household waste, *i.e.* sewage. Judged by this standard it will be seen that almost all the Godmanchester well waters examined are largely contaminated, more especially those (Nos. 4-9) in the central compact part of the borough. A sample of water from the well at Adelaide Terrace (No. 1 in above list) was taken by me with all due precautions, and forwarded for analysis to Dr. Dupré. This well was selected for the purpose, partly on account of a local difference of opinion as to the character of the water, partly because, as regards the situation of the well, the physical characters



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of the water, and the proportion of chlorine contained in it, it compared favourably with most of the wells in Godmanchester. Nevertheless, Dr. Dupré, whose analysis is appended, reports that the results "point strongly to contamination by sewage or surface drainage," and that "the water is certainly unfit for drinking or culinary purposes." *A fortiori*, therefore, would the latter remark apply to most of the other wells in Godmanchester. Nor is this opinion shown to be unfounded by the fact that water of this character may have been drunk for a long time without apparent injury to health resulting. This may be the case as long as the specific germs of disease are absent from the water, but if the excretion of a case of enteric fever or cholera should chance to mingle with the sewage which enters it, an extensive outbreak of the disease among those who drink it would in all probability result.

One or two polluted wells in Godmanchester are said to have been "closed," but apparently are still in use. The following is the history of one of these, viz., that in Adelaide Terrace. A case of diphtheria having occurred in a house in this terrace, the medical man in attendance called the attention of the medical officer of health to the unwholesome condition, as he believed, of the water in the well. The medical officer and inspector of nuisances took a sample of the water, and sent it to the county analyst, who reported it to be contaminated with sewage matter, and unfit for drinking purposes. A communication was accordingly sent by the town clerk to the owner, requesting him to close the well pending the next meeting of the Town Council. At this meeting the owner of the property attended, armed with the opinion of a neighbouring medical officer of health that "the water ought not to be hastily condemned"—an obvious truism,—and bringing a jug of the water, which was handed round in a tumbler to the Town Councillors present, who, having tasted it, pronounced it to be very good, allowed the well to remain in use, and censured the medical officer of health and inspector for their action in the matter.

The appended Report of Dr. Dupré on the sample of this water sent by me confirms that of the county analyst, and shows that the water, though "clear, tasteless, and inodorous," is contaminated with sewage or surface drainage, and unfit for drinking or culinary purposes. The source of contamination in this particular instance is not so easy to determine, whether from a general fouling of the gravel subsoil, from leakage from some neighbouring drain, or from infiltration of water from the river, about 80 yards distant, which at this point receives on the opposite side the sewage of Huntingdon.

It would be, however, impracticable to close all the polluted wells in Godmanchester, unless another supply were available to replace them. From the circumstances which have been mentioned I do not think it likely that wells in the superficial gravel bed, even if care were taken to exclude surface soaking, would in the more compact parts of Godmanchester yield good water. A public supply is therefore required, and might apparently be provided without difficulty if an arrangement could be entered into with the Huntingdon Corporation. The Huntingdon waterworks are stated now to furnish an ample supply of good water; the mains reach to the bridge, which is on the border of the Godmanchester district, and it ought not to be a costly matter to extend them thence along the high road to the central part of the borough, which is only half a mile distant. From the numerous complaints which were made to me by cottagers of the existing wells, it is to be presumed that they would be willing to pay for a plentiful and wholesome supply.

The action taken for the abatement of nuisances does not appear to have gone beyond the removal of accumulations, and such like measures of temporary palliation, no structural works worth mention having been carried out, so far as I can learn. Gross nuisances noted by me at my former visit were found in exactly the same condition on the present occasion, the only improvement being that the accumulations of refuse were perhaps not on so large a scale.

There have been two changes of inspector of nuisances since my previous visit. The present officer has only held the office for a few months, and his predecessor was in failing health for some time before his resignation.

Nothing has been done since my previous visit in the matter of byelaws, nor have any steps been taken to provide hospital accommodation for infectious disease.

The backwater mentioned in my previous Report has been cleared out by public subscription, and is said to afford relief to the water in times of flood; but it is now getting silted up again with mud and weeds.

*Public Health.*—The births in Godmanchester during the seven years 1877–83 have been equal to an average annual rate of 27·7 per 1,000, and the deaths to one of 19·1; this latter, however, does not include those of persons belonging to the district

Abatement  
of nuisances.

Byelaws.  
Hospital  
accommoda-  
tion.  
Prevention  
of floods.



dying in public institutions. The average annual death-rate from the principal zymotic diseases has been 3·2 per 1,000; the deaths under this category including one from smallpox, eight from measles, sixteen from scarlet fever, six from diphtheria (all in 1883), four from whooping-cough, two from enteric fever, and twelve from diarrhœa.

*Diphtheria in 1883.*—During the year 1883 there were six deaths from diphtheria in Godmanchester, and two from “croup,” one at least of which was probably of diphtheritic nature, as there were other cases of diphtheria in the family. Besides these, about 29 non-fatal cases were heard of in the course of the inspection; but the information obtainable as to the non-fatal cases was very incomplete. The cases occurred mostly in the spring of 1883, from February to April; there were also a small group in October 1883, and a few non-fatal ones in the summer of 1884. The times of the year at which they occurred were therefore the same as in the adjacent borough of Huntingdon. The earliest cases in Godmanchester appear to have occurred about the beginning of February 1883; one of the first, if not the first, being a child who died on February 4th of “croup”; which, however, may have been of a diphtheritic nature, as a brother is said to have suffered from diphtheria shortly after. Information as to the origin of the disease, whether by importation from elsewhere, or otherwise, was not at this lapse of time to be obtained. In some cases there was a history of the patient having been exposed to infection from a previous case. At many of the houses where the disease occurred there were nuisances from privies and untrapped drains and polluted well water; but it is to be feared that such conditions are only too general all over the place. I noticed that the fatal cases of diphtheria had many of them occurred in the same places in which scarlet fever was especially prevalent on the previous occasion. As examples, I may mention,—

*Thackray's Yard, Duck End.*—An ill-paved yard, with a large and very offensive midden 10 feet from the pump, the water of which is turbid and stinking; several of the cottages overcrowded. Many cases of scarlet fever in 1880. One death from diphtheria in 1883.

*Bodger's Cottages, Duck End.*—A row of three cottages without back space or through-ventilation, and having only a narrow passage, 12 feet across, in front. The privies belonging to these houses are close to the front doors, and a neighbour's privy abuts on one of them behind. Well nearly under privy; water polluted. Untrapped drain. Scarlet fever in 1880. Diphtheria, one death in 1883.

*Piper's Lane.*—Offensive privies close to house. Polluted water. Many cases of scarlet fever in 1880; one death. Nine cases of diphtheria in 1883.

*Bridge Place.*—A narrow confined yard in a low damp situation near river. Nuisance from privies, stables, and untrapped drains. Polluted water. A few cases of scarlet fever in 1880. Diphtheria in March and October 1883, and July 1884; two deaths.

The medical officer of health attributes the prevalence of diphtheria to the inhaling of sewer gas escaping from untrapped drains, and in one case to impure water. For my own part I do not feel able to express a positive opinion as to the causation of the disease, or how far the sanitary defects which I have mentioned may have been concerned in it, though I think it likely that they had some share in its production. I cannot say that the diphtheria showed any special incidence upon the users of a particular well water, such as we frequently see in enteric fever outbreaks of water origin.

H. FRANKLIN PARSONS.

August 29, 1884.







Grains per Gallon.

Oxygen absorbed from permanganate	-	06.
Total dry residue	-	39.20.
Colour of residue—white.		
Behaviour on ignition—blackens strongly, burns off with difficulty.		
Chlorine	-	3.32.
Nitric acid	-	0.08.
Ammonia	-	0.24.
Albuminoid ammonia	-	0.007.

Westminster Hospital,  
August, 1884.

A. DUPRÉ.