

Mr. W.H. Power's report to the Local Government Board on an outbreak of diphtheria in the Local Board district of Ealing / [W.H. Power].

Contributors

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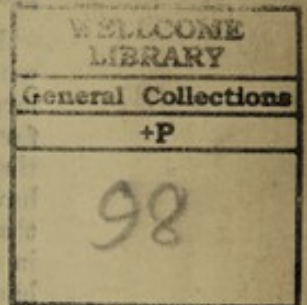
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Mr. W. H. Power's Report to the Local Government Board on an Outbreak of Diphtheria in the Local Board District of Ealing.



INQUIRY into this outbreak, repeatedly urged on the Board by the local sanitary authority and by numerous private persons in Ealing, was ordered 5th February.

On Monday 7th February I, as directed, visited Ealing and conferred with the chairman, and other members, and with the officials of the local authority on the subject of the outbreak. The particulars previously reported to this Board, along with others learned at this visit, are instructive and deserve to be narrated in chronological order.

On Monday 24th January, the Medical Officer of Health of Ealing (Mr. Patten) had observed in his private practice two unquestionable cases of recently developed diphtheria, and learned from his partner the existence of other two similar cases. He inferred therefrom a probable commencement in Ealing of an outbreak of this malady, and forthwith instituted inquiry on the subject among the other medical practitioners in the district.

By the 26th January he had in this and in other ways got to hear of 20 or more cases of recent diphtheria or diphtheritic sorethroat, and had ascertained that the outbreak, so far as particulars as to dates of attack and localities of residence were supplied to him, had been limited to well-to-do people, and that it had been practically simultaneous over a very wide area of the district, affecting indifferently houses on two separate and distinct systems of sewers. Further he had learned that most if not all the diphtheria cases, particulars of which were to hand, had occurred among the milk customers of one and the same dairy.

On this day (26th January) therefore the Medical Officer of Health and the surveyor of the Local Board, made an inspection of the dairy premises in question and of its associated dairy farm, both of which are situated in the Ealing district. But at neither place was discovery made of any unwholesome condition, in the way of obvious sanitary defect or disease of men* or of animals, of a nature to explain that infectiveness of the milk which was held by these officers to be provisionally indicated by the facts which had been collected. At this stage of the proceedings therefore it was decided to invite the co-operation of Professor Corfield in investigation of the outbreak, more particularly in reference to its seeming relations with milk service.

* One of the milk carriers employed at the dairy who suffered diphtheria, was found to have been attacked not before *but after* the disease had begun to appear among customers of the dairy.

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Meanwhile the proprietor of the dairy business which seemed to be implicated (who besides owning the farm was a member of the Ealing Local Board) was furnished by the Medical Officer of Health with a statement of the facts whereon belief in the infectiveness of his milk was based, and an intimation was conveyed to him that not improbably the sale of his milk in the district would, in the interests of public health, have to be prohibited.

Hereupon the proprietor of the business in question pointed out other facts which had not yet become conspicuous, namely, that his business was very large, many hundred families consuming the milk; whereas the outbreak, so far as was indicated by the number of cases reported, had been very small; that his milk was all of one quality and character, the milk of all his cows having been habitually mixed before it left the farm where it was produced; that it had been distributed not alone in Ealing, but also in Acton; and that in Acton not a single case of diphtheria among the consumers of his milk had been heard of. These facts he contended went to show that association of the known diphtheria with his milk service was in all probability no more than an accidental coincidence, and that the true cause of the outbreak would probably, if proper search were made, be found in conditions other than milk supply of the houses invaded. Thus the matter stood at the date, 27th January, of Professor Corfield's visit to Ealing.

Re-examination of the particular dairy and of the farm supplying it, by the sanitary officers assisted by Professor Corfield, failed as had previous examination in detecting any conditions which would satisfactorily account for infective quality of the suspected milk. So far indeed from any new light being thrown on the causation of the diphtheria, all that appeared were some fresh complications of the problem. For it had now come to be asserted with confidence that diphtheria was occurring among other people than those taking milk from the one dairy, and this assertion lent weight to the belief that the suspicion attaching to that milk was unfounded. And conversely, it was found that the one dairy had been distributing milk derived not only from the farm but from other sources outside the Ealing district. These considerations, while they made the history more obscure than before, formed on the other hand a stronger reason than ever for learning the truth. For they showed the Ealing outbreak as having perhaps wider causes than a milk service, though (if milk were really in question) they pointed to danger to other milk consumers both in Ealing district and in other districts. Thus it was seen that milk derived from extraneous sources having perhaps become rejected perhaps wholly or in part by the suspected dairy as soon as occurrence of diphtheria among its customers became known, might, while still retaining its infective ability, have gone to supplement the supplies of other Ealing dairymen, and thus be having concern in the production of later cases of diphtheria which were stated to be occurring among persons who were not customers of the suspected dairy.

Under these circumstances, all thought of prohibiting distribution of the milk proper to the originally suspected dairy was abandoned, and the Ealing Sanitary Authority, finding itself without jurisdiction in the district from which the outside milk now newly coming under suspicion was derived, decided (29th January) to make appeal to the Local Government Board for assistance. Meanwhile, the people of Ealing were growing dissatisfied. It had come to be generally understood that the particular dairy was in some way under suspicion of having caused the outbreak, and now it was known that the sanitary authority hesitated as to the action to be taken in reference to it. By a section of the inhabitants the attitude of the sanitary authority became regarded as dictated by undue concern for the interests of the member of the local board who owned the business in question, and a great mortality among the persons earliest attacked by diphtheria becoming just about this time manifest, indignation and then panic ensued, with the result that urgent appeals, private as well as public, were pressed by the inhabitants upon the Local Government Board for official inquiry into the whole circumstances of the outbreak.



On visiting Ealing I learned that public opinion had already gone the length of condemning the owner of the suspected dairy, as responsible in some way for the outbreak, and that official inquiry was thought of as a means for putting him formally on his defence. This was a method of procedure that was not warranted under the circumstances; and probably it would never have been advocated, had the elementary facts above recorded been known, and something of their relative proportions appreciated; for not only was this a case in which the *prima facie* evidence which had been forthcoming against a particular milk service had failed to get strengthened as more detailed inquiry by the local officers had proceeded, but in so far as suspicion had thereafter continued to attach to the particular business, it tended to implicate that section of its milk which was *not* produced on the premises of the proprietor, and which therefore was least subject to control by him. Nor was this the only objection to procedure of the sort advocated.

The *prima facie* evidence itself, when, on the occasion of my first visit to Ealing (7th February), it came to be examined, turned out altogether insignificant when the total operations of the suspected dairy were taken note of. It was found to be based on at most a couple of dozen cases of diphtheria or diphtheritic sorethroat in regard of about one-third of which particulars as to date of attack, locality of residence, and source of milk supply were not accurately known; whereas the total consumers in Ealing and neighbourhood of the suspected milk numbered some 3,000 persons. It became obvious therefore not only that the notion of public and formal inquiry (unless indeed it should be addressed first of all to examination and cross-examination of sufferers by the outbreak and their medical attendants) must be abandoned, but that investigation would have to be begun *de novo*, namely, by seeking first to ascertain in all needful detail precisely what had happened in Ealing in the way of occurrence of diphtheria and allied throat illness; and that not until this had been done could investigation of the cause of the outbreak be hopefully undertaken. Further it was manifest that in so far as milk service might have been concerned in the diphtheria witnessed no satisfactory understanding of the nature of the connexion could be looked for, unless the proprietor of the suspected dairy and his subordinates could be secured as willing coadjutors, instead of being placed in the position of defendants.

It was therefore arranged that the sanitary authority should make further appeal (by circular letter enclosing a tabular form for facilitating reply) to the medical practitioners of Ealing for information as to all cases of diphtheria, scarlatina, and sorethroat coming under notice in the district since the beginning of the year; and that the public themselves should at the same time be invited to afford similar information, sending it, if they preferred that course, directly to the Local Government Board. This was accordingly done, and the facts as received were put at my disposal. I myself, on receipt of notice of invasion of any household, sought further particulars respecting it by a circular letter which I caused to be sent to the householder concerned, asking precise information under several separate headings.* Meanwhile, and with a view of being prepared beforehand to gauge accurately the values of such series of facts as to association of diphtheria and milk service as might be reported to me, I put myself in communication with the proprietor of the suspected dairy, inviting his assistance and telling him that for the above purpose it was needful that I should master in much detail all intricacies of his business both at the dairy and at his farm. To this he freely assented, placing himself, his men, and his books unreservedly at my service, and thereby affording every assistance in his power to the inquiry.

* These were:—1. Name and address of family. 2. Number of persons in family; (a) over 15, (b) under 15 years. 3. Members of family attacked by diphtheria, by scarlatina, or by sorethroat; with age, condition in life, date of attack, and result of illness in each instance. 4. Source of water supply (defects to be noted). 5. Drainage arrangements (defects to be noted). 6. Name of certain tradesmen supplying household, (a) butcher, (b) fishmonger, (c) baker, (d) greengrocer. 7. Milk supply of household, regular and occasional, with particulars as to quantity of milk taken morning and evening, special supplies of nursery milk and cream, custom as to boiling milk, and the like.

My immediate object in examination of this dairy, and of the farm supplying it, was to ascertain whether *in the event of any connexion being established between this business and the diphtheria*, the ability of the milk to cause diphtheria was to be referred to that section of the supply furnished from the proprietor's farm, or to the supplementary milk derived from extraneous sources. This involved inquiry into the doings daily, at a particular time, of many persons connected with this milk business, into the reception at the dairy, and the method of dealing day by day with near upon 1,000 quarts of milk, and into the distribution of this milk over about a dozen different milk walks. And, of course, therefore, it served not only its immediate purpose of differentiating the milk distributed by the dairy according as it had come from one and another source, but afforded an insight into the inner life of the business likely to prove of the greatest value in the event of detailed evidence respecting the outbreak proving to be inculpatory of any particular supply furnished to the dairy.

The insight thus acquired at no little expenditure of time and labour into the working of this business proved, however, for a reason which will presently appear, superfluous, and I leave the subject, therefore, with a brief statement of the outcome of attempt at differentiation of the milk according as it was derived from one and another source. It was to the following effect, namely, that the outbreak, if connected at all with this milk business, would seem to have been due to the milk proper to it, and not to milk received by it from extraneous sources.

The outbreak (if due to the suspected milk service) could not have been propagated by a not inconsiderable portion of the total supply which was received daily from a farm outside the district, for the reason that diphtheria appeared in some abundance on milk walks wherein none of this extraneous milk had been distributed, while no diphtheria could be heard of on certain other milkwalks wherein the extraneous milk had without question been mainly and daily distributed. Similarly other and smaller supplemental supplies could be set aside as in all probability not having had to do with the outbreak. At no time were they other than infrequent, and at the date of the outbreak the regular supplies of milk tended to exceed the demands of customers. Any addition, therefore, of that sort must have been both rare and infinitesimal, and could not, in the practice of the dairy, have affected more than one, or at most two, whereas the diphtheria affected many of the milk walks.

The time and labour expended in getting knowledge of the inner life of this milk business proved superfluous for the reason that not all the facts respecting behaviour of the diphtheria could be obtained from the people of Ealing. Thus no information, or next to none, was to be got from the persons concerned respecting cases of diphtheritic illness such as were affirmed to have occurred among households not supplied with milk by the suspected dairy. And it was mainly the withholding of this negative evidence which was fatal to further inquiry; not so much, indeed, on account of the absolute amount of evidence that was presumably withheld as by reason of its importance in formulating an estimate of the relative proportions of the incidence upon milk consumers supplied and not supplied from the suspected dairy. For the diphtheria, though causing a great mortality in the persons it attacked, could not, it began to be seen, have been very abundant, whereas the consumers of the suspected milk had numbered several thousands. Under the circumstances, therefore, every particle of evidence as to what had happened in the way of diphtheria; every case, for instance, of diphtheria and of sorethroat, with minute particulars as to dates of attack, localities of residences, milk service, and the like, needed to be taken into account before any attempt at conclusion as to connexion or want of connexion between the operations of the suspected milk business and the outbreak was permissible. Still less was more minute investigation of the doings of the dairy and farm profitable or indeed justifiable, until valid indications had been gained of a causative relation between the two sets of circumstances.

Default of negative and other evidence was no doubt referable to more than one cause. Partly it may have been due to cessation of epidemic extension of the diphtheria about the date of commencement of my inquiry; removal of ground for panic being quickly followed by diminution of general interest in the subject, and even by desire on the part of some persons to forget all about it. Partly also it may have been due to the counter

attractions of a rival hypothesis to the milk theory in explanation of the outbreak, which about the same time made its appearance. This hypothesis, regarding drain emanations as a fertile source of diphtheria, referred the outbreak to alleged drainage defects, public and private, and it possessed therefore the merit of transferring blame for what had occurred from individual private shoulders upon the back of the local board. Accordingly it was satisfactory to some persons, and especially it found adherents among people not apt at distinguishing between opinion and fact. But mainly default of evidence was due to disregard by particular people in Ealing of appeals made to them directly and individually for information on the subject of the outbreak. Thus of 19 medical practitioners personally urged by the Ealing Sanitary Authority to give information, and furnished with forms for facilitating its record and transmission, not more than 11 supplied facts of the sort asked for; other eight either sending no reply at all, or refusing the names and addresses of their patients. Some few, too, of private residents in the place believed to have suffered throat illness in their families disregarded the application which I made to them by circular letter; among them being a gentleman, a customer of the suspected dairy, who lost a child by the disease.

The actual evidence, however, respecting the outbreak which was furnished by the people of Ealing and their medical attendants in response to the appeal of the sanitary authority did not invalidate the provisional conclusions of the Medical Officer of Health. So far as it went, it tended to confirm them. Taking into account sorethroat as well as diphtheria, this evidence went to show that households served by the suspected dairy (which were only about one-fourth as numerous as other households) had suffered to 20 times the extent of households having different milk service. Further it seemed to indicate that so far as diphtheria was concerned the outbreak had affected only customers of the suspected dairy, that it had been limited to the seven days ending 25th January, and that not until this date (January 25th) had sorethroat (which by now was extending in families previously invaded by diphtheria) began to attack customers of other dairies. As illustrating the disproportionate incidence of the outbreak upon the two classes of milk consumers, it may be noted that from 18th January to the middle of February there were among some 500 households getting their milk from the particular dairy 20 invasions, namely 17 by diphtheria, two by diphtheritic sorethroat, and one by "sorethroat" only; whereas in the same period among above 2,000 households otherwise supplied with milk only three invasions, two of them designated diphtheritic sorethroat, and one recorded as sorethroat merely.

Against inferences implicatory of the suspected dairy there was at this stage no evidence whatever. Inquiry that had been made respecting food supplies of the households invaded precluded the notion that diphtheria had been disseminated by food other than milk, and the facts as to sanitary circumstances, drainage, water supply, and the like of invaded houses tended to exclude agencies such as these from concern in the outbreak. Especially did the sewer or drain hypothesis fail in getting support from the facts elicited. Setting aside the difficulty in accounting thereby for the observed selection by diphtheria first of all (if not solely) of households taking the suspected milk, there was the circumstance that the disease had not seemingly affected any particular line of sewers, and that houses on two separate sewer systems, (and a house also not connected at all with the sewers) had been simultaneously invaded in localities widely separate from one another. Further there was the additional fact that in few of these houses could any sanitary defects of the kind usually believed to cause diphtheria be discovered, and the fact also that in not a few of them very special pains had been taken to secure immunity of the dwelling from drain danger or nuisance.*

* In this connexion the abundant care exercised by the Ealing Local Board in securing wholesome conditions of the interior of dwellings of all sorts in its district, deserves mention. A few years ago the Sanitary Authority, having determined that watchfulness in regard of these matters should be systematically bestowed on better class as well as on poorer class houses, ordered house-to-house inquiry among dwellings at rentals from 16*l*. to 150*l*. for the purpose of detecting defects of drainage, water supply and the like. This was forthwith commenced and has since been

Nevertheless the facts thus far by no means sufficed, in the absence of the negative evidence withheld from investigation, to convict the suspected milk of having caused the outbreak. And further the positive evidence adduced itself furnished some grounds for hesitation in forming conclusions on the subject. These consisted in the very uniformity of the testimony adverse to the milk, and in the seeming unusual fatality of the outbreak. For the one was suggestive that many non-fatal cases of diphtheria remained to be discovered, and the other could be thought of as very likely due to special readiness on the part of customers of the suspected dairy to make known the injury they believed they had received therefrom. Accordingly another effort was made by seeking samples of the sort of evidence that was believed to be missing, to get light on the cause of the outbreak. To this end some half dozen separate areas of Ealing were selected for house to house inquiry by circular letter under each of the several headings already enumerated. In all some 150 householders were thus appealed to, and of these 126 returned detailed replies to the queries put to them. 50 of the 126 households turned out to have been customers of the suspected dairy, the remaining 76 having obtained their milk from other sources. The facts as to incidence of throat illness on these households were as follows:—

Invasions.	Month of 1887.	Customers of particular Dairy.	Customers of other Dairies.
HOUSEHOLDS -	January -	$\frac{1}{25} = 28.0$ per cent. One-half diphtheria, or diphtheritic sorethroat.	$\frac{2}{78} = 2.6$ per cent. One-half scarlatina, one-half "sorethroat."
	February -	$\frac{2}{25} = 10.0$ per cent. All "sorethroat."	$\frac{2}{78} = 6.6$ per cent. All "sorethroat."
ADULTS attacked in houses invaded during -	January -	$\frac{1}{113} = 5.7$ per cent. 3 diphtheria, 2 diphtheritic sorethroat, and 13 "sorethroat."	$\frac{1}{113} = 0.8$ per cent. 1 scarlatina, 3 "sorethroat."
CHILDREN attacked in houses invaded during -		$\frac{2}{113} = 7.3$ per cent. 1 diphtheria, 3 diphtheritic sorethroat, and 4 "sorethroat."	$\frac{2}{113} = 0.0$ per cent.
ADULTS attacked in houses invaded during -	February -	$\frac{2}{113} = 1.9$ per cent. All "sorethroat."	$\frac{2}{113} = 0.6$ per cent. All "sorethroat."
CHILDREN attacked in houses invaded during -		$\frac{2}{113} = 4.5$ per cent. All "sorethroat."	$\frac{2}{113} = 3.3$ per cent. All "sorethroat."

The additional evidence thus obtained gave, it will be seen, little help toward study of the question in its negative aspects. Certainly it afforded no suggestion whatever of any large prevalence in Ealing of non-fatal diphtheria, nor indeed of any *diphtheria* at all outside of households getting their milk from the suspected dairy;* but it failed to prove the contrary. In these and in other respects, this additional evidence was altogether consistent with that originally adduced. Thus, besides indicating limitation of diphtheritic illness to con-

continued, so that in the three years 1884-86 no less than 4,712 visits have been made to the 3,742 (estimated) houses of Ealing, and defects of the above sort rectified as follows:—

Kitchen sink pipes disconnected from house drain, and made to discharge over trapped gully in the open air	-	-	-	1,736
Bath, cistern, and lavatory waste pipes, and housemaid's sink pipes dealt with in similar fashion	-	-	-	494
Waterclosets and their apparatus ventilated	-	-	-	217
Watercloset apparatus amended or replaced	-	-	-	202
				<u>2,649</u>

Meanwhile systematic supervisions of conditions belonging but external to dwellings has been by no means neglected. Thus, in the same three years 11,315 visits have been made to yards, mews, stables, fish-shops, slaughter-houses, &c.

* In this connexion it deserves mention that house-to-house inquiry of the above sort was extended to certain quarters of Acton, wherein a small portion of the implicated milk had been distributed. The result there was on the whole negative. No diphtheria among any class of persons was heard of, and only one case of diphtheritic sorethroat. The latter, however, occurred in a household supplied with the particular milk.

sumers of the suspected milk, it further suggested that attacks of this sort had been confined to the month of January, and that not until diphtheria had become established among customers of the suspected dairy did "sorethroat" exhibit any particular tendency to prevail among other persons. So too as regards food supplies, drainage, water service, &c., it was found that the facts about these 126 additional households in no way invalidated provisional inferences implicative of the particular milk; they afforded no hint of an explanation of sudden incidence in January of diphtheria upon customers of the suspected dairy, and upon them alone. Especially, be it noted, did this further effort at getting at the occurrences of the outbreak fail in its object of discovering households having diphtheria though not supplied with milk by the suspected dairy. No such households could be identified among those whose invasion by throat illness was brought to light by this house-to-house inquiry; and accordingly it had to be inferred that such households had altogether eluded inquiry, or that particular householders returning "sorethroat" as having affected their families had not been aware of the real nature of the malady which had invaded them.

To sum up:—All the information obtained in one and another way respecting the recent behaviour of throat illness in Ealing appeared, when it came to be formulated as has been done in the table at the end of the report, to give indications as follows:—These indications, so far as they concern certain matters of fact, which are indisputable, are stated in the text in separate paragraphs:—in so far as they are inferential and subsidiary, they are dealt with in smaller type, and may be accepted or rejected at the discretion of the reader.

1. A sudden and highly fatal, though not large, outbreak of "diphtheria," limited to the seven days 19th to 25th January, and affecting solely the customers of a particular dairy.

As to the specialty of the incidence of this diphtheria outbreak on customers of the particular dairy, there can be no question. Reference to the table at the end of this report will show that with exception of one person attacked 15th February, no case designated "diphtheria" coming under notice occurred earlier than January 19th or later than January 25th. Whether or not there were, as has been alleged, coincident cases among customers of other dairies, the fact remains that *every one of the deaths* by diphtheria occurred in families getting the particular milk.

2. Antecedent to this outbreak of diphtheria, some insignificant prevalence of "sorethroat," most abundant among customers of the particular dairy, but not affecting them to the exclusion of other persons.

To what extent this antecedent "sorethroat" may have been related to the diphtheria which followed, or may have been sorethroat of commonplace sort, such as is usual at the winter season, cannot be estimated, and the significance (if any) of its greater incidence on customers of the particular dairy is correspondingly open to question. Allowance too should perhaps be made for possible greater proneness *after* the diphtheria declared itself, of customers of the particular dairy than of other persons to take note of any sort of sorethroat in their families.

3. Coincident with appearance of diphtheria among customers of the particular dairy and thenceforward to the end of January, considerable increase of sorethroat mainly affecting persons getting milk from the dairy in question. Much of this additional sorethroat designated "diphtheritic." Most of the "diphtheritic" sorethroat occurring among customers of the particular dairy, concurrent with the "diphtheria" outbreak; none of that occurring among customers of other dairies making its appearance until cessation of the "diphtheria outbreak."

Whatever may have been the nature of the sorethroat which was antecedent to the diphtheria outbreak, there is here tolerably strong indication that sorethroat concurrent with it was in the main due to the same cause as the diphtheria. Its earlier and greater incidence on customers of the particular dairy, therefore, is consistent with an influence causative of diphtheritic illness operating first and most intensely on these people before getting opportunity for extending to other persons.

4. Abrupt cessation toward the end of January of "diphtheria"; followed in a few days by interruption for a short while of sorethroat prevalence. Later,

in early February, renewed prevalence of sorethroat; to be heard of most abundantly among customers of the particular dairy, but in so far as it was "diphtheritic" affecting only other persons.

The cessation of the diphtheria, especially of the fatal diphtheria, toward the end of January is definite enough; and, along with the indication of interruption about the same time of sorethroat prevalence, would seem to imply somewhat sudden arrest of conditions favouring epidemic distribution of diphtheria. Subsequent renewal of sorethroat prevalence is not inconsistent with this view; for by the beginning of February, a state of panic in Ealing rendered any sort of sorethroat, however trivial, liable to be regarded with apprehension, and helped to secure its being duly made note of. In so far as this additional sorethroat was diphtheritic, it is like enough to have been secondary to the diphtheria already established in the district; and in so far as it was trivial, its greater incidence on customers of the particular dairy may very possibly have been due to greater alertness to throat malady on the part of these people and corresponding greater readiness to make known any misfortune of this sort which had befallen them.

In the end then the provisional inferences of the officers of the Ealing Sanitary Authority implicatory of the particular milk, which were based on specialty of incidence of the outbreak on customers of the suspected dairy, have been fully justified. Having regard to all obtainable facts, negative as well as positive, and taking into account also evidence of one and another sort not presenting itself for examination, a very strong presumption remains that milk distributed from the dairy in question did somehow or other have to do with the outbreak of diphtheria witnessed. But there is nothing amounting to proof of this, and on the other side an explanation is wanted of a notable disproportion between the quantity of milk distributed by the suspected dairy and the amount of diphtheria witnessed among its customers. Under the circumstances I have recorded, questions further arising have not admitted of study on the present occasion, and consequently an opportunity has been lost of getting knowledge on this very difficult subject.

W. H. POWER.

TABLE showing, so far as facts have been obtainable, the incidence, day by day for the first six weeks of 1887, of DIPHTHERIA, SCARLATINA, and "SORETHROAT," in EALING, upon Customers of a particular Dairy and upon other Persons. [Customers of the particular Dairy numbered above 500, Customers of the other Dairies above 2,000 households.]

Customers of a particular Dairy.						Remarks.	Customers of other Dairies.						Remarks.		
Date 1887.	Diphtheria.			"Sorethroat."			Date 1887.	Diphtheria.			"Sorethroat."				
	Houses invaded.	Persons attacked.	Attacks afterwards Fatal.	Houses invaded.	Persons attacked.			Attacks afterwards Fatal.	Houses invaded.	Persons attacked.	Attacks afterwards Fatal.	Houses invaded.		Persons attacked.	Attacks afterwards Fatal.
1 Jan.	—	—	—	—	—	—	*2 diphtheritic throats.	1 Jan.	—	—	—	—	—	—	Scarlatina.
2 "	—	—	—	—	—	—		2 "	—	—	—	—	—	—	
3 "	—	—	—	—	—	—		3 "	—	—	—	—	—	—	
4 "	—	—	—	1	1	—		4 "	—	—	—	—	—	—	
5 "	—	—	—	—	—	—		5 "	—	—	—	—	—	—	
6 "	—	—	—	—	—	—		6 "	—	—	—	—	—	—	
7 "	—	—	—	1	1	—		7 "	—	—	—	—	—	—	
8 "	—	—	—	—	—	—		8 "	—	—	—	—	—	—	
9 "	—	—	—	—	—	—		9 "	—	—	—	—	—	—	
10 "	—	—	—	—	—	—		10 "	—	—	—	1	1	—	
11 "	—	—	—	—	1	—		11 "	—	—	—	—	—	—	
12 "	—	—	—	—	—	—		12 "	—	—	—	—	—	—	
13 "	—	—	—	—	—	—		13 "	—	—	—	—	—	—	
14 "	—	—	—	—	—	—		14 "	—	—	—	—	—	—	
15 "	—	—	—	1	1	—		15 "	—	—	—	1	1	—	
16 "	—	—	—	—	—	—		16 "	—	—	—	—	—	—	
17 "	—	—	—	1	1	—		17 "	—	—	—	—	—	—	
18 "	—	—	—	—	—	—		18 "	—	—	—	—	—	—	
19 "	1	1	1	*2	*3	—	19 "	—	—	—	—	—	—		
20 "	4	4	2	1	1	—	20 "	—	—	—	—	—	—		
21 "	5	6	4	—	—	—	21 "	—	—	—	—	1	—		
22 "	5	5	3	—	1	—	22 "	—	—	—	—	—	—		
23 "	4	4	2	*2	*3	—	23 "	—	—	—	—	—	—		
24 "	1	1	—	—	2	—	24 "	—	—	—	—	—	—		
25 "	1	2	—	1	1	—	25 "	—	—	—	1	1	—		
26 "	—	—	—	*1	*3	—	26 "	—	—	—	—	—	—		
27 "	—	—	—	1	2	—	27 "	—	—	—	*2	*2	—		
28 "	—	—	—	1	3	—	28 "	—	—	—	—	—	—		
29 "	—	—	—	*1	*3	—	29 "	—	—	—	—	—	—		
30 "	—	—	—	—	1	—	30 "	—	—	—	—	1	—		
31 "	—	—	—	—	—	—	31 "	—	—	—	—	—	—		
1 Feb.	—	—	—	—	—	—	1 Feb.	—	—	—	—	—	—		
2 "	—	—	—	1	3	—	2 "	—	—	—	—	—	—		
3 "	—	—	—	3	3	—	3 "	—	—	—	1	1	—		
4 "	—	—	—	—	3	—	4 "	—	—	—	—	—	—		
5 "	—	—	—	—	—	—	5 "	—	—	—	*2	*2	—		
6 "	—	—	—	1	1	—	6 "	—	—	—	—	*2	—		
7 "	—	—	—	—	—	—	7 "	—	—	—	1	*2	—		
8 "	—	—	—	—	1	—	8 "	—	—	—	—	1	—		
9 "	—	—	—	—	1	—	9 "	—	—	—	—	—	—		
10 "	—	—	—	—	—	—	10 "	—	—	—	—	—	—		
11 "	—	—	—	—	—	—	11 "	—	—	—	—	—	—		
12 "	—	—	—	—	—	—	12 "	—	—	—	—	—	—		
13 "	—	—	—	—	1	—	13 "	—	—	—	1	1	—		
14 "	—	—	—	—	—	—	14 "	—	—	—	1	1	—		
15 "	—	—	—	—	—	—	15 "	1	1	—	—	1	—		

