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REPORT

ON

RELAPSING FEVER,

IN

ST. GILES DISTRICT,



1869-70,

By GEORGE ROSS, M.D., &c., &c.,

Medical Officer of Health for St. Giles District.



1870

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REPORT

ON

RELAPSING FEVER,

1869-70.

TO THE BOARD OF WORKS FOR THE ST. GILES DISTRICT.

GENTLEMEN,

Early Period of the Epidemic.

The Epidemic of Relapsing Fever, having apparently, run through its course in this District, I am now in a position to present to you a Report comprehending all the important facts connected with this visitation. The first intimation I received of the existence of this disease in St. Giles was conveyed to me in a letter from the House Physician of King's College Hospital bearing date September 20th, 1869; in which letter it was stated that five cases of Relapsing Fever had recently been admitted into that Hospital from No. 22, Great Wild Street. I, thereupon, instituted an inquiry into the facts. It was ascertained that of the cases reported by the House Physician of King's College Hospital, *three* (Careys) were members of one family occupying a room on the second floor of the house in Great Wild Street; and there was strong reason to believe that they had contracted the fever from another family (the Neals) who occupied a room at No. 20 in the same Street. Four of these Neals had suffered from fever of the Relapsing type; the first among them who was attacked being an infant who died from an affection, described in the Register as "Marasmus, Diarrhœa." Mrs. Neal was sister-in-law to Mrs. Carey, and the families were in frequent communication. When Mrs. Neal's children were ill, they were nursed by a Mrs. Meenan, the mother of Mrs. Barrett, living at No. 22, Great Wild Street, whose child was also attacked with the fever. Mrs. Meenan subsequently died of some other disease. We thus trace in this group of cases a distinct family connexion, and may reasonably conclude that contagion exercised an important influence in the propagation of the fever.

Two other women called Neal residing in Dudley Street, but, so far as I have been able to ascertain, not related to the family of the same name in Great Wild Street, also suffered from the fever. These were the *first* persons attacked in the District, and were removed on the 18th August to the London Fever Hospital. Another member of this family, also a female, fell ill on September 4th, about a fortnight after the mother and sister. These persons worked in Covent Garden Market.

Relapsing Fever among the Hop-pickers.

The next group of cases occurred on October 2nd and the following days as shown in the Register. This batch included the family of the Connors and its relations. They were nine in number and returned on the 24th September from hop-picking in Kent. A brother-in-law of Mary Connor (the mother of one branch of the family) received them into his room at the back of the ground floor at No. 14, Lincoln Court; and in a short time all of them were attacked with fever. Margaret McCormac the mother-in-law and another branch of the family went to lodge at No. 6, King's Arms Yard; they also had fever on October 5th. The grandfather and grandmother of these Connors, and Black, the brother-in-law who sheltered this family on their return from the Country likewise succumbed at a later period, the first two on the 27th and 28th October, and Black on the 10th November. These three, it would appear, caught the disease by infection.

Another family (the Goodwins) associated with the Connors and fell ill on October 11th. A few other cases occurred about this time chiefly among tramps and hop-pickers.

There can be little doubt that these Connors imported the disease; which was induced in them, as it was in nearly all the subsequent cases, by extreme destitution and exposure to inclement weather. The season had been unusually bad for the hop-pickers, and they had consequently suffered severe privation.

In illustration of the mode of living of the hop-pickers during their temporary sojourn in Kent I quote the following description from evidence given by Mr. Edward Stanhope before the Commissioners appointed to enquire into the employment of young children, &c. He says: "It is not uncommon for growers to provide straw and hurdles, and leave to the pickers, immediately on their arrival, to build up any sort of shelter which their ingenuity can suggest. In other cases an old barn is thrown open, and they are left to occupy it as they can, with such partitions between families or bins' companies as they may be disposed to put up. Sometimes 'hurdles are put between the beds, leaving them to twist straw in if they like. *They seldom do so.*' (Evid. 142.) In several cases that came under my notice at least fifty men, women, and children were living in one large temporary hut, without any attempt at partitions. In another the 'lean to's' round a barn,

in which the owner would have been ashamed to put his cattle, were utilized for the purpose.' This mode of life is admirably adapted to the production of fevers.

Mr. Simon's Letter.

Such was the amount of Relapsing Fever in St. Giles District when Mr. Simon, the Chief of the Medical Department of the Privy Council, addressed to your Board a letter bearing date October 23rd, 1869. Mr. Simon pointed out in this letter the characteristics of the disease and the best methods for its prevention. His communication was followed by a visit from Dr. Buchanan, Medical Inspector of the Privy Council, who urged the adoption of appropriate sanitary regulations, and who, I am pleased to say, both then and subsequently provided me with full information and useful advice with reference to the progress of the Epidemic.

Your Committee now enjoined me to take all necessary measures to mitigate the Epidemic which threatened to be severe. In pursuance of their instructions I had an interview with Mr. Bennett, the Parochial Medical Officer, and arranged with him an improved dietary for those poor persons who were in a weakly condition and likely to be attacked by the fever; whilst the Sanitary Inspectors were ordered to see that the processes of disinfection of rooms and houses where the Epidemic had appeared were thoroughly carried out. A more comprehensive House Inspection of the District was commenced, and resulted in the detection of other cases of disease, of which notice was given to the Parochial Medical Officers.

Among others a few groups of cases may be noticed as shewing the more marked characteristics of the Epidemic at this early period. A boy, Waite, went on tramp to Yarmouth, and, returning home by way of Gravesend, slept with some hop-pickers. On the 24th October he was taken ill in the apartment of his mother, at No. 23, Crown Street; three more of the family were then attacked. On the 27th October three of the family of the Flanagans, who occupied the adjoining room, fell ill with the fever; on November 2nd two other children (Flanagans), and, on November 4th, two more of the same family were stricken: in all 11 persons occupying two rooms on one floor of this house were victims of the Epidemic. They presumably, caught the disease from the boy Waite. There was not another case of fever among the other occupiers of this house. The influence of contagion in these cases can scarcely be doubted.

Again, three Sullivans, members of one family, residing at No. 10, George Street, had the disease on October 26th. They had returned from hop-picking about a fortnight, and had associated with the Driscolls, at No. 3, Clark's Mews—Mrs. Driscoll and Mrs. Sullivan being sisters; on the following day, October 27th, three of the Driscolls fell ill with fever, and on October 28th two more of this family were attacked.

From this time there was a succession of scattered cases, some of them, as George Griffiths, Samuel Parry, and the women Horton, Cade, and McDuggan, were hop-pickers, others were tramps just returned to Common Lodging Houses, and several, like the Flahertys (who were related to the Connors) recipients of the fever from persons previously attacked with whom they had been in immediate contact. In a few instances no definite source of contagion could be traced.

Second Period. Relapsing Fever in Common Lodging Houses.

About the 20th November the Epidemic began to assume a new aspect, and we entered upon what may be regarded as its second stage. The cases diminished considerably in frequency among the resident poor families, and they no longer appeared in groups among which a common link of association could be traced. On the other hand there was a large increase among the denizens of Common Lodging Houses. A few attacks had already occurred among this class of persons; but now they began to be reported every day; and often several in one day. On the whole there have been 97 cases among persons living in Common Lodging Houses out of a gross number of 241 cases. But it must be observed that in the larger number of instances of attacks in Common Lodging Houses the persons applying had either recently come from the Country or had migrated from some other Parish and had been only one, two or three nights in the Lodging House; thus furnishing additional evidence to show that this fever was, to a great extent, imported, and was not generated in the District. Nevertheless, when it occurred, it was so obviously infectious, that the most stringent regulations were necessary to prevent its extension among the healthy population.

Appointment of a Temporary Inspector.

On the 26th November F. W. Webb commenced his duties as Temporary Sanitary Inspector, by the order of your Board; and the duty for searching for these cases by house-to-house visitation, of bringing them under the notice of the Medical Officers, and of attending to the disinfection of premises devolved chiefly upon him.

The Condition of the Common Lodging Houses.

I made a careful inspection of most of the Common Lodging Houses in this District; and I am enabled to state that they are generally kept in a proper and wholesome condition so far as regards cleansing and limewashing, and the good order of the dust-bins and water-closets; but the houses are commonly old and unsuitable for their purpose; with narrow dark staircases, and small rooms with low ceilings; and they are generally deficient of the proper means of ventilation. They are usually the very worst houses in the Parish. I caused measurements to be taken of several rooms for the purpose of ascertaining the amount of accommodation they could afford; and I found

that in all cases they were overcrowded, that, in fact, they were not qualified to accommodate more than half the number of beds allotted to them by the Police Authorities under whose control they are placed. This is a great evil, and a prolific cause of disease. On my representation of the banefulness of this overcrowding to the Police Inspectors, the Authorities promptly ordered a diminution of the number of beds in some of the worst cases; but this is not enough. The scale of cubic feet for each bed should be enlarged, and the overcrowding diminished throughout the District. The kitchens, also, are usually too small; for, being used as sitting rooms, the lodgers swarm in them on wet and cold days and render the atmosphere close, fetid, and noxious. In all cases the kitchens should bear a due proportion in size to the number of inmates.

The total number of houses in St. Giles District licensed as Common Lodging Houses is 76 having 439 rooms; and the total number of lodgers allowed is 2177; of whom 266 are women.

Comparative Sick-Rate in Common Lodging Houses.

The following Table shows the number of cases of Relapsing Fever among the population of Common Lodging Houses in comparison with the number among the population of the three Sub-districts after the population of the Common Lodging Houses has been subtracted. Cases sent from the Workhouse and those occurring in persons without residence are omitted.

TABLE I.—*Shewing Comparative Sick-Rate in the Three Sub-Districts and in Common Lodging Houses.*

SUB-DISTRICTS.	Population.	Cases.	Ratios.
St. George, Bloomsbury	17,392	7	1 in 2484
St. Giles South	17,940	72	1 in 249
St. Giles North.....	16,578	44	1 in 377
Common Lodging Houses	2 177	97	1 in 22.4

It is thus made obvious that there was an enormous disproportion of cases in Common Lodging Houses; there having been eleven times as many in them in proportion to population as in St. Giles South, the Sub-district which shows the next largest number of cases. Nearly all the houses in the Sub-district of St. Giles South are, moreover, sublet in lodgings to working people, many of whom are in great destitution. I have much pleasure in stating that the Police Inspector Serjeant Knight was placed under my superintendence during the Epidemic; and that he made me daily reports.

The Influence of Privation.

The facts recited show that Relapsing Fever prevailed exclusively among the lowest class of the population, the ill-fed, the ill-clothed, the ill-housed. Privation almost invariably preceded and accompanied it; hence it has been called "Famine Fever." Tramps and paupers were its especial victims; and among paupers, those who were in the most abject circumstances. Costermongers and labourers escaped, even that humble class of the population who are attended by our Dispensary Physicians were almost entirely exempt. The reports made to me contain frequent expressions of this nature:—"This family is in great want," "Have been ill-fed," "Very poor," "Very badly off, no meat for a long time, very little bread," &c. Our first duty was, through the instrumentality of the Board of Guardians who promptly and kindly acted upon the suggestions of your Board, to improve the dietary of these poor people, and I have no doubt that the liberal administration of relief by the Guardians directly tended to the reduction of the number of cases among the families of paupers. But in what way insufficient food induced this disease, or why privation induced it this year rather than in any previous year when the same degree of want must have been suffered by many of our population are questions not easily answered. Gradual starvation, moreover, as in the instance of the Welsh Fasting Girl, does not necessarily bring on Relapsing Fever. This difficulty invites inquiry into other considerations which I now propose to examine.

Overcrowding and Infection.

It is noticeable that during the early period of the fever, it spread chiefly among large families, and in overcrowded rooms. By looking over the list we shall see that there were generally several children in each affected family, and, as they always lived together in a single small room, there can be no question about their overcrowding. At a later period the Common Lodging Houses furnished the patients; and I have already shown the inadequate accommodation they afford. Whatever may be the nature of the poison of Relapsing Fever, or however generated, there cannot be a doubt that overcrowding would intensify its energy; hence it rarely happened that a single member of a family escaped where the numbers were large. Overcrowding, then, exercised its pernicious influence by increasing the power of, and liability to "infection;" and my observations convince me that the spread of the disease was due, in a considerable degree, to infection either by the agency of persons or clothing.

Age and Sex.

In order to exhibit the influence of age and sex in determining attacks of this fever I have constructed the following Table.

No. II.—*Age and Sex.*

SEX.		AGE, under										Age unascertained.
		5 years	10 years	15 years	25 years	35 years	45 years	55 years	65 years	75 years	85 years	
Males	134	3	4	12	33	32	20	10	14	1	1	
Females	96	1	12	9	26	11	12	12	3	3	0	21
Sex unascertained	11	1	0	0	0	0	0	0	0	0	0	
		5	16	21	59	43	32	22	17	4	1	220
Total	241											241

It would be unsafe to trust to the figures in this Table as affording an indication of the real influence of age and sex: in fact, it must be read in the light of local knowledge. If we relied upon the Table we should conclude that inasmuch as the majority of cases occurred between the ages of 25 and 55, the prime of life, persons at those ages were more liable to the invasion of Relapsing Fever than younger ones. Yet this would be a mistake. Of the first 100 cases, whose ages were ascertained, 35 were under 15 years; and if we were to add to these the number of those children whose ages are not recorded we should get 45 cases of children out of the 100 at all ages. This large proportion of children was owing to the fact that the disease was epidemic in families. During the latter part of the Epidemic, however, when it prevailed chiefly among the denizens of Common Lodging Houses, who are nearly all single men,—bachelors, widowers, or wife-deserters, we get a preponderance of persons of mature years. For the same reason the indications of sex in the Table are fallacious; at first there was a greater number of females; latterly most males.

Domestic Nuisances.

The direct effect of domestic nuisances *per se*, e.g., foul water-closets, overcharged dust-bins, and filth generally, in propagating the disease cannot be satisfactorily estimated. The largest number of cases in families occurred among persons occupying first and second floors, and the attacks were usually confined to separate families. So many Connors, so many Waites, so many Flanagans made up the sum. One or two families on a floor would be attacked, and not one of the children would escape; whilst not a single case in many instances would occur in other families residing in the house, though exposed to the same domestic influences. Of course noxious miasms concentrated in an overcrowded room very much aggravate the evils of overcrowding.

The utmost vigilance was, therefore, exercised to keep the houses clean and wholesome, as everything that tends to lower vital tone, favours the production of epidemic disease.

At an early period after the attention of the Board was called to the prevalence of this Fever in the District, notices were distributed impressing upon the public the importance of personal and domestic cleanliness, and pointing out the best methods for the disinfection of premises, for the management of sick persons, and for the prevention of the spread of the Epidemic by contagion. The Inspectors carefully superintended the carrying out these instructions.

So much then for these personal and local causes, among which poverty and overcrowding indirectly, and contagion directly, are the most important. We shall now consider the influence of the general meteorological conditions.

Meteorological Conditions.

An examination of the Chart in the Appendix in connexion with the Table No. 5 will furnish us with a knowledge of the leading meteorological facts of the period. I may observe that all zymotic diseases, though arising from a specific cause, are subject to meteorological conditions as regards their proneness to spread, and to become virulent. Each disease affects its particular range of temperature and season of the year in its visitations. The question now is, what is the relation of these conditions to Relapsing Fever?

The Meteorological Chart, which is constructed from the Reports of Mr. Glaisher, published by the Registrar General, exhibits the number of attacks, the amount of ozone, the degree of temperature and the atmospheric humidity for each day from the 22nd of October, when correct records were commenced, to the 28th of February, since which date we have had only occasional cases. The "attacks" are enumerated from the second day of the commencement of atmospheric change; as I found that the influence of the change first made itself apparent about that time. Had the attacks, however, been calculated from the actual day of atmospheric change, the means would not have been sensibly altered; for I have estimated them in both modes; but I have preferred that adopted because it is most consistent with the phenomena. Had the periods embraced larger numbers the same minuteness would not have been required. There is only one day in the Chart on which the recorded facts seem inconsistent with the general tenour of the phenomena, and that is the 27th of October, when the cases are reported as 11 and the temperature as very low on the same day; but it is necessary to state, in explanation, that the Inspector having just begun his house inspections brought in on that day an undue number of cases, some of which had been ill for a few previous days. After that time the cases were reported in more regular succession.

The Table No. 5 contains 10 series of cases and of meteorological

phenomena, each series being framed with reference to the *degree of temperature*: for example, when the temperature fell, for a given time, below the mean daily temperature of 50 years, all the cases occurring during that time are noted and their mean taken; and, in connexion with the temperature, the other meteorological phenomena for the period are recorded. So again, if the temperature rose, for a definite time, above the mean daily temperature, the same classification of the various facts was made in relation to it. We thus see what relation the attacks and the various meteorological phenomena bore to the temperature, and to one another. The results may be thus expressed:

Temperature and Humidity.

During the period of the utmost prevalence of the Epidemic in St. Giles, the highest temperature, at Greenwich, was $^{\circ}54.2$ and the lowest $^{\circ}26.3$, and this may be considered the range within which Relapsing Fever prevailed among us in its epidemic form. Occasional cases may continue to occur at higher or lower temperatures, as may be observed of other epidemic diseases; but even these would require to be carefully examined as regards the date of their origin and the associated meteorological states. Within the limits of this range, however, it does not appear that either an elevation or lowering of temperature had much influence over the spread of the disease. For instance, when the mean daily temperature was $^{\circ}44.4$ we had 2.2 cases a day, when it was $^{\circ}41.4$ we had 3.4 cases a day, and when it sunk to $^{\circ}31.4$ we still had 3 cases a day; whilst, in the last series, when the mean temperature was also $^{\circ}31$. we had only 0.9 case a day. It seems obvious upon a careful comparison of the data in the Table that neither raising nor lowering of temperature, within the range, either increased or diminished the number of cases. So also, with regard to the humidity of the air we cannot trace a definite relation between it and the spread of the Epidemic; nor even when we take temperature and humidity together does the influence appear marked.

Ozone.

The next step in the analysis affords more satisfactory results. If we look down the "Ozone" column we shall find a very decided relation in the inverse order, between the amount of ozone in the atmosphere and the attacks. For example, when the mean amount of ozone was so low as 0.4 at Greenwich, the attacks were so high as 3.4 a day, when it mounted to 1. they were 3 a day, when 1.3 they were 1.9 a day, when 1.4 they were 1.4 a day, when 2. they were 1 a day, when 2.5 they were 1.2 (a slight discrepancy) when 3.0 they were 0.9 a day; and when 5.0 they were, 0.3 a day.

Wind and Rainfall.

There is one member of the series, viz., No. 5, when this gradation was departed from; but if we look into the "Wind" and "Rainfall" columns we shall find the cause of this deviation from the rule. In the 5th Series

the mean horizontal movement of the wind was as much as 517 miles a day, the mean pressure was 2.2, and the mean rainfall was 0.16, thus showing the strongest gales and the heaviest rainfall for the season. I may observe, with reference to the increased quantity of ozone in association with a high wind, that this is commonly the case; and that also there is usually more ozone detectable during northerly and easterly winds than when winds blow from the opposite directions; and that this rule was observed, in a general way, but by no means strictly, during the Epidemic. The medical bearing of the facts is, however, the main subject of consideration in these notes.

The inverse relation of ozone to attacks is explained by the fact that ozone is the great natural agent of disinfection. By its operation all organic matters in the atmosphere are decomposed and rendered innocuous. The determination of the quantity of ozone being made at Greenwich does not affect the result; for the quantity observed at Greenwich may be reasonably regarded as an index of the quantity that would be found generally in the atmosphere of the Metropolis if it were not neutralized by the quantity of materials emitted into the air from the various sources of effluvia in a populous city. The more ozone, the larger the quantity of noxious exhalations destroyed; and consequently the lower the amount of fever produced.

How a strong wind and heavy rainfall may impede or counteract the beneficial operation of ozone may be explained in various ways:—1st, by forcing poor people in doors, and thereby aggravating the evils of overcrowding; 2ndly, in the case of a high wind, by carrying off from the body an unusually large quantity of animal heat, and thus, among ill nourished people particularly, directly diminishing vital power; 3rdly, by producing congestion of internal organs and mucous surfaces; 4thly, when the rainfall is excessive, by stirring up foul deposits in our sewers, or wherever else filth accumulates, and promoting, by moisture, the extrication of organic poisons; 5thly, by a combination of all these evils.

As a rule the fall of rain washes the air and cleanses it of the disease—producing poisons that float in it; but there can be no doubt that in cities, in forests, and in marshy districts, one of its immediate consequences is to set free various organic poisons that, until the rainfall, had remained quiescent. In the circumstances under consideration ten days of heavy rain, with a temperature above mean, would combine to increase the intensity of sewer and other miasms.

This analysis of the relation of ozone to attacks seems to prove that Relapsing Fever is due to specific poison floating in the atmosphere—a poison that is probably weak in its action, and easily destroyed; and for that reason affecting injuriously half-starved and feeble individuals.

During the earlier months of the Epidemic the direction of the wind was generally from West, South-West, and South; at the beginning of Spring it changed to East and North-East with a gradual diminution of disease.

General Causes.

I forbear to estimate the indirect or remote influence of moral and physical causes arising out of the habits of the people: such as intemperance, and excesses of all kinds, because we can rarely gain so accurate a knowledge of these as to be able to fix their relative value. Besides what may be true of the general may be false of the particular. I may illustrate this position by referring to the heavy sick-rate for the Christmas week. It would be easy to say, and probably it would be true, that the customary excesses of that week led to the great sickness; but it might turn out on inquiry that the poor people who were attacked were exceptions to the general rule. I therefore refrain from associating conjectural causes with an analysis of this nature, which aims at being simply an analysis of facts.

The Nature and Source of the Specific Poison.

So far as this investigation has gone it brings into relief those influences that facilitated or impeded the propagation of the Epidemic; it does not distinctly reveal the nature of the specific poison, although it shows the probability of its existence. That there is a specific poison I have no doubt, though it is not at present capable of actual demonstration like the virus of Small-pox, and can only be inferred. As to the source of it I am inclined to think that it has a vegetable origin; first, because of the Relapsing or Remittent character of the disease; for it is well known that the typical intermittent and remittent fevers are derived from organic vegetable miasms; secondly, there is distinct evidence that in numerous instances the sick brought the disease with them from rural districts where they bivouacked at a time of the year when vegetable decomposition was in active operation. That the fever might also have been derived from the malaria from our sewers does not militate against this supposition; for it is pretty certain that our sewers contain as large a proportion of vegetable as of animal remains, whether their contents be regarded as the *débris* of our own food, of the food of animals or of our various culinary and manufacturing operations.

Inferences.

The inferences I draw from the foregoing analysis are the following:—

1st.—That there is a specific poison that induces Relapsing Fever.

2nd.—That among personal and domestic influences, privation and overcrowding are the most powerful causes that call the virus into activity.]

3rd.—That the epidemic character of the Fever is chiefly determined by

a, Infection both by personal contact and fomites

b, Meteorological phenomena, among which the most important are, a temperature ranging between °26.3 and °54.2, a deficiency of ozone in the atmosphere, high winds blowing from West and South, and heavy rainfall.

These inferences are offered as the result of inquiry into the facts recorded; and are open to question. The collocation of a larger number of

facts may justify the correction or qualification of the inductions I have arrived at; yet, I cannot but believe that this investigation of the phenomena of the Epidemic as observed in St. Giles District will prove useful to sanitary science.

The Death-Rate.

The Death-rate from Relapsing Fever is not high; the disease being comparatively mild. None of the sufferers died who were attacked in the early period of the Epidemic; and all the children and adolescents recovered. The first case that died was attacked on December 20th, and all who succumbed were advanced in life, if we except one woman, aged 45. The number of deaths was six, of which number four were deaths of males. The excess of males was owing to the fact that there was a preponderance of males among the attacks at a late period of the Epidemic, as I have already explained. Some of the deaths occurred very early after removal to Hospital, and were probably owing to some internal complication. I have no intention, however, of entering upon the purely medical history of the cases, and shall conclude this Report with the following Table, giving the Return of Deaths.

TABLE III.—*Return of Deaths from Relapsing Fever.*

Date of Attack.	Date of Death.	No. of Days of Illness.	Sex.		Age.	Total No. of Deaths.	Total No. of Cases.	Rate per 1000 of of Deaths to Cases.
			M.	F.				
Decr. 20	Jany. 1	12 days		F	66			
„ 26	Decr. 29	3 days	M		63			
„ 27	Jany. 7	11 days	M		45	6	241	24.9
Jany. 4	„ 6	2 days	M		60			
Feb: 16	Feb. 17	1 day	M		63			
„ 24	„ 28	4 days		F	56			

This small mortality (being in the ratio of one death to forty attacks, whilst the ordinary mortality in this disease is stated to be about one in ten) is probably owing, in a great measure, to the admirable arrangements made by your Board conjointly with the Board of Guardians, in pursuance of which all the affected persons were removed as soon as they were attacked to Hospital, where they received prompt treatment. I cannot conclude this Report without bearing testimony to the important service rendered to our District in its emergency by the London Fever Hospital.

I have the honour to be,

GENTLEMEN,

Your obedient Servant,

GEORGE ROSS, M.D.

March 31st, 1870.

TABLE NO. IV.

Register of Cases of Relapsing Fever, 1869—70.

No.	NAME.	SEX.	AGE	RESIDENCE.	DATE.	WHERE SENT.	REMARKS.
		M. F.					
1	Mary Neal.....	F	45	33, Dudley-street ...	Aug. 18	Fever Hos.	
2	Neal	F	18	33, Dudley-street ...	.. 18	..	
3	Neal.....			20, Great Wild-street	.. 20	Home.	
4	Neal.....			20, Great Wild-street	.. 20	..	
5	Neal.....			20, Great Wild-street	.. 20	..	
6	Neal.....			20, Great Wild-street	.. 20	..	
7	Carey.....	F	37	22, Great Wild-street	Sept. 3	King's C. H.	
8	Carey.....	M	11	22, Great Wild-street	.. 8	..	
9	Carey.....	M	40	22, Great Wild-street	.. 11	..	
10	Catherine Neal.....	F	11	33, Dudley-street ...	.. 4	Fever Hos.	
11	Harriet Kimberly.....	F	47	4, Great Wild-street	.. 27	Workhouse.	
12		F	11	11, Drury-lane .....	.. 29	King's C. H.	
13	Barrett		2	22, Great Wild-street	.. 15	..	
14	Susan Dezage	F	38	5, Kennedy-court ...	.. 10	..	
15	John Weed	M	10	3, Tower-street .....	.. 30	Fever Hos.	
16	Jennings	F	47	17, Lincoln-court ...	Oct. 2	Home.	
17	Mary Connor	F	30	14, Lincoln court ...	.. 2	..	
18	Charles Connor.....	M	32	14, Lincoln-court ...	.. 4	..	
19	Ellen Connor	F	9	14, Lincoln-court ...	.. 5	..	
20	Connor			14, Lincoln-court ...	.. 5	..	
21	Connor			14, Lincoln-court ...	.. 5	..	
22	Payne.....	F	30	5, Parker-street ...	.. 3	..	
23	Margaret McCormack	F	60	6, King's Arms-yard	.. 5	Fever Hos.	
24	James Connor	M	22	6, King's Arms-yard	.. 5	..	
25	Connor	F		6, King's Arms-yard	.. 5	Home.	
26	Connor	M		6, King's Arms-yard	.. 5	..	
27	Ellen Appol	F	53	Workhouse .....	.. 5	Fever Hos.	
28	James Dorling	M	9	3, King-street .....	.. 9	Inf., Wkhse.	
29	Richard Goodwin.....	M	24	8, Lincoln-court ...	.. 11	Fever Hos.	
30	F. Goodwin	F		8, Lincoln-court ...	.. 11	..	
31	Fanny Goodwin	F	14	8, Lincoln-court ...	.. 14	..	
32	James Kerwin.....	M	62	23, Great Wild-street	.. 16	King's C. H.	
33	Bridget Duggan	F	14	84, Dudley-street....	.. 18	Fever Hos.	
34	Charlotte Hunt	F	36	5, Kennedy-court ...	.. 22	..	
35	Mary Martin	F	38	21, Tower-street .....	.. 23	..	
36	Waite.....	M	14	23, Crown-street ...	.. 24	Home.	
37	Waite.....	M	30	23, Crown-street ...	.. 24	..	
38	Waite.....	F	Child	23, Crown-street ...	.. 24	..	
39	Waite.....	F	Child	23, Crown-street ...	.. 24	..	
40	Mary Kent	F	68	Workhouse .....	.. 25	Fever Hos	
41	Catherine Kingsberley	F	45	4, Great White Lion-st	.. 25	..	
42	James Sullivan	M	20	10, George-street ...	.. 23	..	
43	Mary Sullivan	F	15	10, George-street ...	.. 26	..	
44	Catherine Sullivan ..	F	7	10, George-street ...	.. 26	..	
45	Mary Driscoll	F	14	3, Hampshire Hog-yd.	.. 27	..	
46	Patrick Driscoll	M	13	3, Hampshire Hog-yd.	.. 27	..	
47	Julia Driscoll	F	9	3, Hampshire Hog-yd.	.. 27	..	
48	Mary Flanagan.....	F	39	23, Crown street ...	.. 27	..	
49	Frederick Flanagan....	M	14	23, Crown-street ...	.. 27	..	
50	Emily Flanagan	F	7	23, Crown-street ...	.. 27	..	
51	Richard Champneys....	M	29	7, George-street ...	.. 27	..	
52	George Griffiths	M	29	14, Short's Gardens..	.. 27	..	
53	Charles Connor.....	M	57	9, Lincoln-court ...	.. 27	Home.	
54	Horton	F	15	7, Pit's-place. ....	.. 27	..	
55	Emma Cook	F		19, Newton-street....	.. 27	Fever Hos.	
56	Connor	F	50	9, Lincoln-court ...	.. 28	..	
57	Margaret Driscoll	F	7	3, Hampshire Hog-yd.	.. 28	..	
58	John Driscoll	M	4½	3, Hampshire Hog-yd.	.. 29	..	

TABLE No. IV.—(Continued.)

No.	NAME.	SEX.		AGE	RESIDENCE.	DATE.	WHERE SENT.	REMARKS.
		M.	F.					
59	Mary Lloyd		F	29	Workhouse	Oct. 29	Fever Hos.	
60	William John Smith	M			19, Great Wild-street	.. 30	..	
61	Samuel Parry	M		27	2, Chapel-yard .....	.. 31	..	
62	Jennings.....				17, Lincoln-court....	.. 31	Home.	
63	Jennings.....				17, Lincoln-court....	.. 31	..	
64	John Finn.....	M		13	22, Great Wild-street	.. 22	..	
65	Ann Finn		F	40	22, Great Wild-street	Nov. 1	..	
66	John Finn.....	M		36	22, Great Wild-street	.. 2	..	
67	Margaret Connor.....		F	23	14, Lincoln-court....	.. 1	Fever Hos.	
68	Martha Hickman		F	14	19, Coal-yard .....	.. 1	..	
69	Edward Wiles	M		22	2, Thorney-street....	.. 1	Home.	
70	William Seeley..	M		43	22, Great Wild-street	.. 2	..	
71	Ann Flanagan		F	15	23, Crown-street ....	.. 2	Fever Hos.	
72	Mary Ann Lambert...		F	27	10, Tower-street .....	.. 2	..	
73	William Hill	M		6	50, Great Wild-street	.. 2	Home.	
74	Matilda Ann Flanagan		F	12	23, Crown-street ....	.. 2	Fever Hos.	
75	William Flanagan	M		9	23, Crown-street ....	.. 4	..	
76	Susan Flanagan		F	8	23, Crown-street ....	.. 4	..	
77	Peter Hill.....	M		22	Workhouse .....	.. 5	..	
78	Sarah Cade		F	31	9, George-street .....	.. 6	..	
79	Ada Stewart.....		F	49	19, Newton-street....	.. 6	..	
80	Eliza Halliday		F	19	23, Great Wild-street	.. 8	..	
81	Hugh Doyle	M		18	5, Kenedy-court ....	.. 8	..	
82	Ellen Beasley		F	17	23, Great Wild-street	.. 10	..	
83	Frederick Black	M		22	15, Lincoln-court ....	.. 10	..	
84	M. A. Duggan.....		F	12	22, Charles-street ....	.. 10	..	
85	Caroline Flaherty		F	36	7, Pitt's-place .....	.. 12	..	
86	Jane Stickenson		F	20	19, Newton-street....	.. 12	..	
87	Joanna Flaherty		F	6	7, Pitt's-place .....	.. 12	..	
88	John Flaherty	M		5mths.	7, Pitt's-place .....	.. 12	..	
89	Bridget Flaherty.....		F	13	7, Pitt's-place .....	.. 12	Home.	
90	Ann Whelan.....		F	9	19, Church-lane ....	.. 13	Fever Hos.	
91	Michael A. Hearn	M		45	84, Dudley-street ....	.. 13	..	
92	Mary Flaherty		F	9	7, Pitt's-place .....	.. 15	..	
93	George Herbert	M		28	14, Short's-gardens ..	.. 15	..	
94	Robert James	M		10	5, Arthur-street .....	.. 15	..	
95	Ann Bryan		F	6	23, Great Wild-street	.. 15	King's C. H.	
96	Ellen Bryan		F	2½	23, Great Wild street	.. 15	..	
97	Henry Davis..	M		24	2, Little Denmark-str.	.. 15	Home.	
98	Sarah Bryan.....		F	30	23, Great Wild-street	.. 16	Fever Hos.	
99	Menry Bryan	M		5mths.	23, Great Wild-street	.. 16	..	
100	Joseph Honey	M		10	2, Coal-yard .....	.. 16	Home.	
101	Charles Clements.....	M		60	22, Charles-street....	.. 18	Fever Hos.	
102	William Bush	M		38	5, Kennedy-court....	.. 20	..	
103	Robert Thomas.....	M		48	51, Charles street....	.. 20	..	
104	William Johnson.....	M		52	8, Charles-street ....	.. 20	..	
105	John Harper.....	M		61	Workhouse .....	.. 20	..	
106	John Dwyer.....	M		60	51, Charles-street....	.. 23	..	
107	Dennis Sullivan	M		26	Bedfordbury .....	.. 23	..	
108	Catherine Sullivan ..		F	25	Bedfordbury .....	.. 23	..	
109	Charles Finch	M		22	10, Queen-street ....	.. 24	..	
110	Henry Walker	M		23	14, Short's-gardens ..	.. 25	..	
111	Frederick Huxley	M		25	11, George-street ....	.. 25	..	
112	James Hodges	M		39	2, Church-lane .....	.. 26	..	
113	Thomas Devine	M		23	2, Church-lane .....	.. 26	..	
114	Catherine Frazer		F	52	25, Newton-street....	.. 27	..	
115	Ellen Baxter.....		F	21	25, Newton-street....	.. 29	..	
116	Sarah Mills		F	18	25, Newton-street....	.. 29	..	
117	Alfred Carter			28	Kennedy-court .....	.. 30	..	
118	Charlotte Jones	M	F	18	44, Charles-street....	Dec. 3	..	
119	William Morgan	M		35	6, Queen-street .....	.. 3	..	
120	John Watkins	M		42	24, Great Wild-street	.. 3	..	
121	Charlotte Taylor		F	30	2, Regent's-place ....	.. 4	..	

See No. 143.

ABLE No. IV.—(Continued.)

No.	NAME.	SEX.		AGE	RESIDENCE.	DATE.	WHERE SENT.	REMARKS.
		M.	F.					
122	John Reeves.....	M		12	19, Church-lane.....	Dec. 4	Fever Hos.	
123	Joanna Jackson.....		F	33	43, Charles-street....	6	..	
124	John Cronin.....	M		34	6, Orange-court.....	7	..	
125	John Martin.....	M		23	3, Pitt's-place.....	8	..	
126	Mary Ann Kerr.....		F	54	2, Regent's-place.....	8	..	
127	Mary Ann Huxtable.....		F	38	43, Charles-street....	9	..	
128	Caroline Morgan.....		F	25	1, Munas-buildings..	10	..	
129	Joseph Jeffery.....	M		37	Bloomsbury Chambers	10	..	
130	Eliza Jones.....		F	24	2, Princes-court.....	11	..	
131	John Wilson.....	M		35	1, Chapel-yard.....	12	..	
132	Henry King.....	M		25	24, Charles-street....	13	..	
133	Daniel D. Wyse.....	M		57	6, Lincoln-court.....	13	..	See No. 190.
134	John Brown.....	M		42	16, Church-lane.....	13	..	
135	Bridget Lane.....		F	50	11, Charles-street....	13	..	
136	James Wells.....	M		68	Workhouse.....	13	..	
137	Henry Smith.....	M		24	51, Charles-street....	15	..	
138	Richard Tasker.....	M		34	1, Kennedy-court....	16	..	
139	Edward West.....	M		21	51, Charles-street....	16	..	See No. 188.
140	Frederick Barron.....	M		45	Workhouse Infirmary	17	..	
141	William Norris.....	M		29	6, Little Denmark str.	17	..	
142	William Munday.....	M		30	No Residence.....	17	..	
143	Henry Walker.....	M		25	Workhouse.....	19	..	Returned to F. II. See No. 110.
144	James Jones.....	M		19	24, Charles-street....	20	..	
145	William Bruton.....	M		32	50 or 52, Charles-street	20	..	
146	George Markham.....	M		54	50 or 52, Charles-street	20	..	
147	Robert Slater.....	M		57	50 or 52, Charles-street	20	..	
148	Thomas Sharp.....	M		29	51, Charles-street....	20	..	
149	James Kelly.....	M		37	No Residence.....	20	..	
150	Ann Basington.....		F	66	St. Giles's Workhouse	20	..	Died Jan. 1st.
151	Amelia Jenkins.....		F	39	53, Charles-street....	21	..	
152	John Reeves.....	M		12	Wkhs. returned & re-sent to F.II.	22	..	
153	William Jenkins.....	M		14	53, Charles-street....	21	..	
154	William Burbidge.....	M		49	2, Chapel-yard.....	23	..	
155	Stephen Willis.....	M		30	51, Charles-street....	26	..	
156	Frederick Herbert.....	M		63	24, Great Wild-street	26	..	Died Dec 29th
157	Welsh.....				10, Gilbert-street....	26	Home.	
158	Welsh.....				10, Gilbert-street....	26	..	
159	Hancock.....		F		16, Gilbert-street....	26	..	
160	Louisa Jenkins.....		F	16	53, Charles-street....	23	Fever Hos.	
161	James Mara.....	M		23	7, Clark's-buildings..	27	..	
162	Owen Kenedy.....	M		19	10, Carrier-street....	27	..	
163	William Aldin.....	M		45	52, Parker-street....	27	..	Died Jan 7th.
164	Mary Ann Roske.....		F	35	24, Charles-street....	27	..	
165	Godwin Taylor.....	M		25	3, Maru's-buildings..	28	..	
166	William Appleton.....	M		32	2, Queen's-street....	28	..	
167	Frederick Jones.....	M		38	15, Short's-gardens..	29	..	
168	Thomas Lindsay.....	M		50	51, Charles-street....	29	..	
169	Richard Fry.....	M		37	Workhouse.....	29	..	
170	James Watson.....	M		20	14, Short's-gardens..	30	..	
171	Lydia Jenkins.....		F	7	53, Charles-street....	30	..	
172	James Brown.....	M		62	8, Charles-street....	30	..	
173	Mary Hardey.....		F	57	22, Charles-street....	30	..	
174	James Beckmore.....	M		28	8, Charles-street....	31	..	
175	Mary Ann Corcoran.....		F	16	12, Short's-gardens..	31	..	
176			F	16	7, Pitt's-place.....	8	King's C. H.	
177			F	5	7, Pitt's-place.....	29	..	
1870								
178	Mary Ann Connor.....		F	17	2, Parker-street....	Jan. 3	Fever Hos.	
179	Charles Jones.....	M		16	Workhouse.....	4	..	Came out of F. II. Dec. 24, & returned
180	Michael Maddon.....	M		60	Workhouse, from 2, Church-lane	4	..	Died Jan. 6th
181	Timothy McCarthy.....	M		75	1, George-street....	6	..	

TABLE No. IV.—(Continued.)

No.	NAME.	SEX.		AGE	RESIDENCE.	DATE.	WHERE SENT.	REMARKS.
		M.	F.					
182	Margaret Clocker.....		F	23	10, Carrier-street ...	Jan. 7	Fever Hos.	
183	John Burns	M		18	45, Charles-street ...	.. 7	..	
184	John Rough.....	M		20	5, Barley-court .....	.. 7	..	
185	Jane Thomas		F	38	50, Charles-street .....	.. 10	..	
186	William Whitelaw ..	M		50	50, Charles-street ...	.. 10	..	
187	Edward Lynch	M		26	8, Charles-street .....	.. 12	..	
188	Michael Clocker	M		32	19, Church-lane .....	.. 12	..	
189	Edwin West	M		20	51, Charles-street.....	.. 12	..	Returned to F. II. See No. 139.
190	Caroline Parfitt		F	23	71, Dudley-street .....	.. 12	..	
191	Daniel Dwyer	M		57	6, Lincoln-court .....	.. 12	..	Returned to F. II See No. 133.
192	Edward Deakin	M		40	51, Charles-street .....	.. 13	..	
193	Margaret Smith		F	17	19, Newton-street.....	.. 13	..	
194	Margaret McCarthy		F	19	27, New Compton-str.	.. 14	..	
195	Eliza Parfitt		F	17	71, Dudley-street .....	.. 15	..	
196	Alfred Orpen	M		22	11, Church-lane .....	.. 17	..	
197	Daniel Pickering	M		21	15, Little Wild-street ..	.. 18	..	
198	Thomas Smith	M		21	14, Short's-gardens .....	.. 18	..	
199	Amelia Davis		F	19	46, Charles-street.....	.. 19	..	
200	John Redding	M		17	11, Church-lane.....	.. 21	..	
201	Thomas Brown.....	M			19, Church-lane.....	.. 21	..	
202	John Boyle	M		25	23, Charles-street.....	.. 21	..	
203	Ann Terry.....		F	66	17, Great Earl-street ..	.. 21	..	
204	James Smith	M		20	19, Church-lane .....	.. 25	..	
205	George Howell.....	M		23	2, Regent's-place .....	.. 25	..	
206	John Turner.....	M		47	45, Charles-street .....	.. 25	..	
207	John Connor	M		25	11, George-street.....	.. 26	..	
208	Mary Proud		F	31	22, Charles-street.....	.. 28	..	
209	Esther Orpen		F	19	11, Church-lane .....	.. 28	..	
210	William Donovan.....	M		19	19, Great Wild-street ..	.. 31	..	
211	Hugh Kenny	M		59	19, Church-lane	Feb. 1	..	
212	James McCoy	M		28	5, Cross-lane.....	.. 4	..	
213	James Watson.....	M		21	27, King-st., Drury-la.	.. 8	Met. Dis. As.	
214	Michael Marr	M		17	56, Dudley-street .....	.. 9	..	
215	Daniel Galvin	M		58	Workhouse .....	.. 14	..	
216	Eleanor Bradwell.....		F		3, Smith's-court .....	.. 15	Fever Hos.	
217	Bridget Dwyer.....		F	17	6, Lincoln-court .....	.. 15	Met. Dis. As.	
218	Jane Reeves.....		F	8	19, Church-lane .....	.. 15	..	
219	Honora Sullivan		F	46	63, Dudley-street.....	.. 15	..	
220	John Allen	M		63	2, Regent's-place .....	.. 16	..	Died Feb. 17th
221	Joseph Kirby	M		34	2, Regent's-place .....	.. 16	..	
222	Jane Neal.....		F	49	17, Lincoln-court .....	.. 18	Home.	
223	Rebecca Carter.....		F	38	14, Short's-gardens .....	.. 19	..	
224	Thomas Robinson ..	M		41	11, Church-lane .....	.. 21	Met. Dis. As.	
225	William Clark	M		22	22, Charles-street.....	.. 21	..	
226	James Greenwood ..	M		35	5, Kennedy-court.....	.. 23	..	
227	Eliza May.....		F	56	5, Denmark-place.....	.. 24	..	Died Feb. 28th
228	Richard May	M		19	5, Denmark-place.....	.. 24	..	
229	Rose May		F	16	5, Denmark-place.....	.. 24	..	
230	Charles White	M		30	8, Charles-street .....	.. 28	..	
231	George Taylor	M		21	15, Short's-gardens ..	.. 28	..	
232	John Smith	M		35	Workhouse .....	.. 28	..	
233	Daniel Driscoll.....	M			26, New Compton-str.	March 1	..	
234	William Woodcock ..	M		21	Vagrant Shed .....	.. 4	..	
235	John Wall.....	M		29	Vagrant Shed .....	.. 9	..	
236	James Hudson.....	M		6½	5, Pitt's-place .....	.. 11	Fever Hos.	
237	Henry Bradwell	M		41	3, Smith's-court .....	.. 11	Met. Dis. As.	
238	Edward Bryan.....	M		35	8, Charles-street .....	.. 13	..	
239	Charles Hersey.....	M		10	28, Lit. St. Andrew-st.	.. 13	Home.	
240	Nelson Judge	M		27	15, Short's-gardens ..	.. 14	Met. Dis. As.	
241	John Quinn	M		35	Workhouse (Tramp)	.. 22	..	

NOTE.—Several of the Cases returned from the Workhouse were Tramps found ill in the Vagrant Wards; others had been only a day or two in the Workhouse, whilst two were persons returned to the Fever Hospital, who had been sent out before they had recovered.

TABLE V.—Cases of Relapsing Fever with the Meteorology of the Period, 1869—70.

No. of Cases.	Dates.	No. of Days.	Average Number of Cases per diem.	Average Amount of Ozone per diem.	Mean Temperature of Periods.	Mean Humidity of Air. (Full Saturation 100).	General Characteristics of Temperature and Humidity.	Wind.		Mean Rainfall per diem.
								Mean Horizontal Movement per diem.	Mean Pressure on square foot per diem.	
1	From Oct. 23rd to Oct. 31st	11	3.4	0.4	°41.4	82	Temp. continuously below mean. Humidity variable.	Miles. 296	lbs. 0.5	Inches. 0.013
2	" Nov. 1st to Nov. 14th	14	1.9	1.3	°44.6	79	Temperature variable. Humidity low.	414	1.0	0.025
3	" Nov. 15th to Nov. 19th	5	1.4	1.4	°45.8	92	Tem. and Humid. both continuously above mean.	254	0.24	0.02
4	" Nov. 20th to Dec. 9th	11	1.4	1.7	°35.0	87	Temp. continuously below mean. Humidity variable.	278	0.43	0.034
5	" Dec. 11th to Dec. 20th	10	2.2	2.0	°44.4	84	Temperature above mean. Humidity variable.	517	2.2	0.16
6	" Dec. 24th to Dec. 30th	7	3.	1.	°31.4	79	Temperature continuously below mean.	311	0.53	0.0
7	" Dec. 31st to Jan. 17th	18	1.2	2.5	°42.4	89	Temp. and Humidity both continuously above mean.	345	1.0	0.09
8	" Jan. 18th to Jan. 30th	13	1.0	2.0	°31.8	79	Temp. and Humidity both continuously below mean.	232	2.5	0.0
9	" Jan. 31st to Feb. 8th	9	0.3	5.0	°42.4	89	Temp. and Humidity both continuously above mean.	291	0.4	0.053
10	" Feb. 8th to Feb. 23rd	16	0.9	3.0	°31.0	71	Temp. continuously below mean. Humidity low, but variable.	431	1.3	0.012

TABLE VI.—(Continued.)

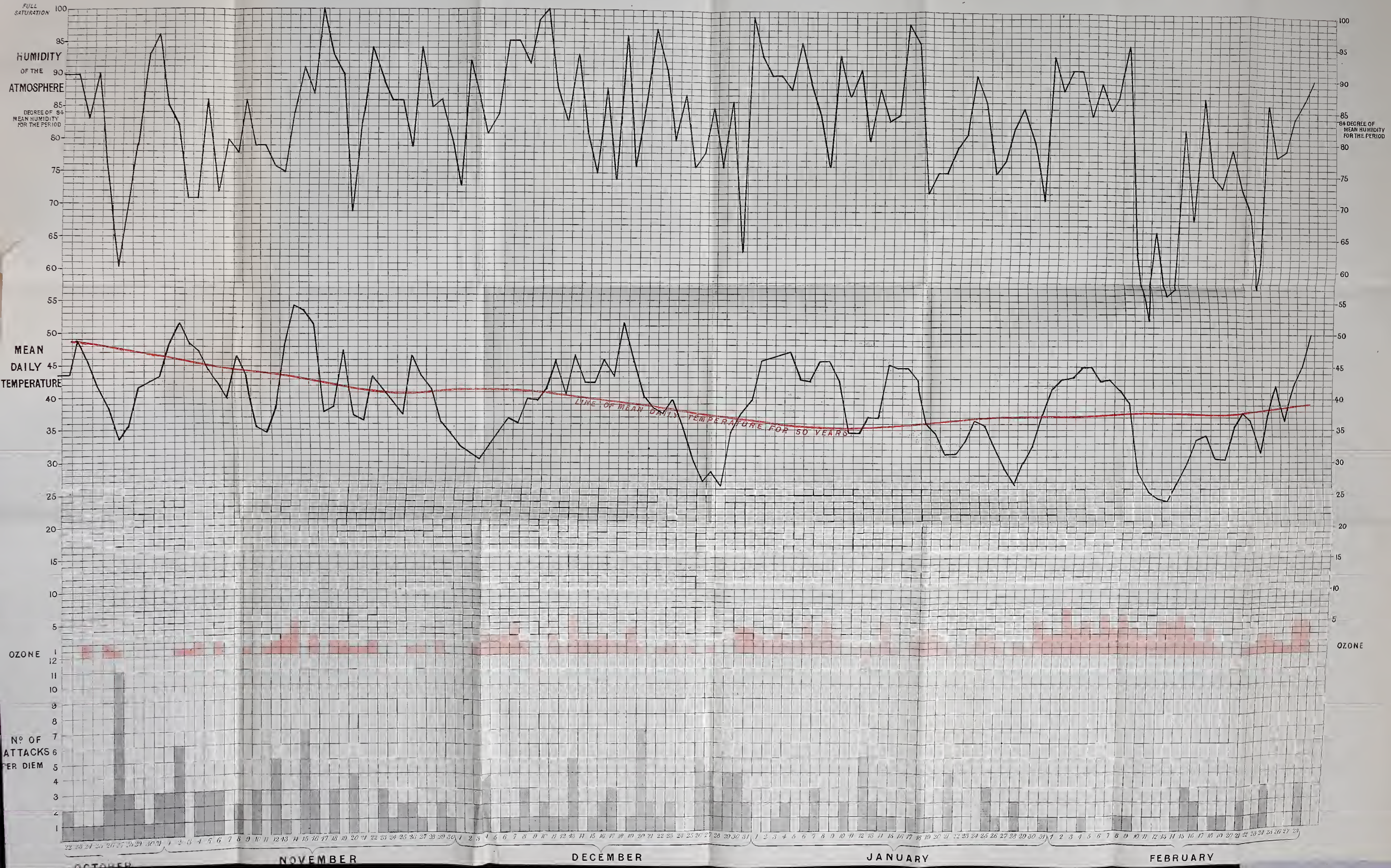
DISTRICT.	STREET AND NUMBER.	Whether Lodging House or not.	D A T E S .												House Total.	District Total.
			Aug. 21	SEPTEMBER, weeks ending	OCTOBER, weeks ending	NOVEMBER, weeks ending	DECEMBER, weeks ending	JANUARY, weeks ending	FEBRUARY, weeks ending	MARCH, weeks ending						
	Parker-street No. 5	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 52	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	King-street " 3	Yes	...	1	...	...	...	...	...	...	...	...	...	...	1	1
	" " 27	Yes	...	...	...	...	...	...	...	...	...	1	...	...	1	1
	Short's-gardens " 12	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 14	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 15	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Mara's-buildings " 1	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Chapel-yard " 1	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 2	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Coal-yard " 2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 19	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Cross-lane " 5	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Prince's-court " 2	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Queen-st. (Dials) " 2	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 6	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 10	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 6	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Orange-court " 5	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Barley-court " 8	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Charles-street " 8	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 11	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 22	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 23	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 24	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 43	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 44	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 45	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 46	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 50	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 51	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 53	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 19	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	Newton-street " 25	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1
	" " 25	Yes	...	...	...	...	...	...	...	...	...	...	...	...	1	1

TABLE VI.—(Continued.)

DISTRICT.	STREET AND NUMBER.	Whether Com- m. Lodg- ing House or not.	Up to Aug. 31	D A T E S .												House Total.	District Total.	
				SEPTEMBER, weeks ending 5 12 19 26	OCTOBER, weeks ending 3 10 17 24 31	NOVEMBER, weeks ending 7 14 21 28	DECEMBER, weeks ending 5 12 19 26	JANUARY, weeks ending 2 9 16 23 30	FEBRUARY, weeks ending 6 13 20 27	MARCH, weeks ending 6 13 20 27								
St. Giles, North.	Dudley-street No. 33	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	3
	" " 56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	" " 63	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2
	" " 71	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
	" " 84	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
	Tower-street " 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	" " 10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	" " 21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	Hampshire Hog- yard, Clarks-mews	5
	Clark's-buildings	1
	Church-lane " 2	2
" " 11	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
" " 16	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" " 19	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" " 10	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
Carrier-street " 5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Arthur-street " 2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Lit. Denmark-st. " 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" " 5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Denmark-place " 5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
New Compton-st. " 27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" " 26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Crown-street " 23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Gt. White Lion-st. " 4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
George-street " 1	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
" " 7	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
" " 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62
" " 10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
" " 11	Yes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Workhouse.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19
No Residence.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3

TABLE N° 7.

CHART OF DAILY RETURN OF CASES OF RELAPSING FEVER, MEAN DAILY TEMPERATURE, HUMIDITY OF AIR AND OZONE.



1	2