ON THE PREVALENCE AND DISTRIBUTION OF
FEVER IN DUBLIN.*

By THOMAS WRIGLEY GRIMSHAW, M.D. Dub.,

Fellow and Censor of the King and Queen's College of Physicians; Physician to the
Cork Street Fever Hospital; Physician to and Lecturer on Materia
Medica in Dr. Steevens's Hospital; etc.

IN bringing forward the following remarks at the present time, I am performing an unpleasant duty; unpleasant, because I have to show not only that fever is more prevalent in Dublin than it had been during the past few years, and that it is on the increase, but that the form of fever considered by sanitarians as the most preventable is the one most increased; that fever is widely spread through Dublin; and that the conditions which favour the spread and production of fever, and with it all forms of zymotic disease, are so rife in our city, that we cannot expect any permanent diminution in fever without some great change in our present sanitary system. It has been my intention for some time to arrange and map out certain information which I have been collecting with regard to the distribution of fever in Dublin, with especial reference to those cases admitted into Cork Street Fever Hospital. I did not intend to make these observations public until after the close of the hospital year in March next; but certain circumstances have recently occurred which have induced me to hurry on these observations, and to add to them some remarks on the prevalence of fever in Dublin.

I do not wish again to refer to the discussion which took place during the autumn, in the Dublin papers and in the *BRITISH MEDICAL JOURNAL*, and in which I took a prominent part; yet I think I may state that, although it may have been attended with some disadvantage to all engaged in the discussion, the public are likely to derive some advantage therefrom, and have been incited to take an interest in the prevention of contagious disease. This occurrence of the discussion to which I have referred caused me to bring forward this paper at the present time. I do not purpose to enter upon the general question of the sanitary condition of Dublin, as I understand that within a short period that question will be fully brought forward by a gentleman who is fully investigating the subject. This paper will naturally divide itself into two parts—the prevalence of fever, and its distribution.

I shall first consider the question of the prevalence of fever in Dublin. I have prepared a table showing the fluctuations in fever and zymotic disease in Dublin during the fifteen years ending March 31st of the current year. This table includes some other diseases not of the febrile zymotic class; but practically these make but little difference in the fluctuations. Fever is practically one zymotic disease; and all the illustrations to the cases in the diagram may be considered as due to the increase or decrease of that disease. The numbers for the years 1857 to 1869 inclusive are derived from the returns to the Dublin Hospitals Board, as published in the reports of that body. The numbers for the last two years are from returns kindly made out for me by Mr. Wilson Hughes, the Secretary to the Hospitals of the House of Industry, and Mr. Eustace, the Registrar of Cork Street Hospital. I have calculated the average from the figures found in the report of the Hospitals Board only, as these are public documents, and can be consulted by any one interested in the matter.

It is thus shown that, commencing with the year 1857, when the Board of Superintendence furnished their first report, fever fell until the year 1859, when it rose again for one year (1860); it then fell again for one year (1861), to rise again continuously until 1866, when the number of admissions reached 3,562. In this year cholera also prevailed; and as that disease is included in the Hardwicke Hospital returns to the number of 187, this number may fairly be taken off the total, leaving the number 3,375, almost the same as the preceding year. Cholera cases are not admitted into Cork Street Hospital. Fever prevailed to a greater extent during the year 1866 than at any other time during the period under consideration. The numbers in Cork Street Hospital on one day reached 185, these being nearly all typhus cases. From 1866 (year ending March 31st, 1867) fever steadily decreased, until the year 1869, when the admissions reached but 1,821. It has, however, been since rising; the admissions having been 2,264 and 2,345 respectively for the two years ending March 31st, 1871. It will thus be seen that the rate of admission to the fever-hospitals was much the same during the year ending March 31st, 1871, as it was ten years ago. The rate of admissions into Cork Street Hospital, I find, corresponds with the rate of the total admissions into the two hospitals; the only exception being in the year 1864. The admissions into the Hardwicke Hospital do not so closely correspond with the total admissions. I

believe that the close correspondence between the admissions into Cork Street Hospital and the total admissions depends on the fact that the accommodation in Cork Street is practically unlimited, as for only one day during the fifteen years under consideration was it necessary to give notice that no more patients could be received, and fortunately this notice had not to be acted upon. Another reason is that, as far as practicable, none but contagious febrile diseases are admitted into Cork Street Hospital. The close proximity of the hospital to the worst fever-districts is an additional reason why the admission-rate should so closely measure the prevalence of fever. From this account we see that fever, which had decreased, has been on the increase for the past two years.

We may test this question, again, in another way, but not for so long a period, by consideration of the death-returns of the Registrar-General, as published in the weekly slips for Dublin. I have arranged the number of admissions into Cork Street Hospital by quarters, for the five years ending September 30th, 1871, and the deaths from fever registered during the same period. I have for each year divided the number of admissions by the number of deaths; and though the result is always the same, the correspondence appears to me to be surprisingly close. If we compare the annual death-rates with one another, we find that for the past two years fever, and deaths from fever, have increased to nearly what they were five years ago; and both are above the average of the five years under consideration.

I have thus shown that fever has not been permanently checked in Dublin, but is in nearly the same state as it was ten years ago, and is above the average of the last five years. I believe that the low fever-rate of the years 1868 and 1869 was but one of those temporary fluctuations which occur from time to time, and that it cannot be ascribed to action taken under the Sanitary Act of 1866; or if it can be ascribed to such action, then the measures taken must have been so relaxed that fever is resuming its old sway in Dublin.

I have next to consider the relative prevalence of late of the different forms of fever. In considering this question, we may leave relapsing fever out of the question, as but two cases of that disease have been admitted into Cork Street Hospital during the past two years. From the tables and diagrams which I have constructed and here show, it will appear that, while typhus and simple fever have been on the decrease, enteric fever has been on the increase. Thus, in the year ending September 30th, 1870, typhus was above the average during eight months, while the following year it was above the average for but four months. On the contrary, enteric fever was but one month above the average in the first year, while in the second it was above the average for nine months. It is worth remark here, that the increase of the simple forms of fever generally accompanies, or immediately precedes or follows, increase in some one of the other forms. When it is remembered that enteric fever is generally considered by sanitarians to be dependent on bad drainage or impure water-supply, it is difficult to account for the sudden increase of that form of fever in Dublin, as we show that the water-supply is nearly perfect, and that the drainage has been steadily, though slowly improving. It has been suggested to me that the stirring up of dirt, consequent on the construction of new drains, might be the cause; but I cannot see that this can account for it, as I find fever connected with local unsanitary conditions, and I have not, in any of the fever-nests which I have visited, discovered that there has been any such stirring up, for the very good reason that there has been no attempt at forming effectual drains for these houses. I do not believe that the Vartry water is the cause; as, if it were, the increase of enteric fever should have occurred before the present year. I admit, however, that I have heard of a suspicion of sewage-pollution of the Roundwood reservoir. There is one way in which the Vartry water may have indirectly caused pollution of drinking-water; namely, people not liking the Vartry have taken to an old pump; and I have given a considerable number of instances of this kind. I think, however, we must look to the peculiarity of the weather which we have lately had, especially its dampness, as a cause. But here I am again puzzled, as I have found that an increase of moisture favours an increase of typhus, and showed this to be the case in a paper read before this Society on January 17th, 1866; but this will not explain the production of enteric fever under similar circumstances. I believe myself that the conditions favourable to the production and spread of typhus and enteric fevers are more closely allied than is generally supposed to be the case. I shall presently show that all forms of continued fever are frequently produced under identical circumstances.

I must now proceed to the second part of my subject; namely, the distribution of fever in Dublin. If we look to the distribution of fever in Dublin, as shown by the death-returns of the Registrar-General for the five years ending September 30th, 1871, it will be seen that of the 1,476 deaths from fever during that period, 922 were on the south side of the city, and but 554 on the north side. This is not merely owing

* Read before the Medical Association of the College of Physicians, November 15th, 1871.

to the larger population of the south side than of the north; for the ratio of deaths to population on the south side of the city was 1 in 149.8, while it was but 1 in 177.5 on the north side; the annual average being 1 in 977.3 for the north, and 1 in 746.1 for the south side. This state of things is easily accounted for when we compare the population per acre on the north and south sides: it being but 57.9 per acre on the north, while it is 70.8 per acre on the south side; and this gives but a faint idea of the density of the population in the fever-districts. Thus, in Woodquay Ward, which includes a considerable portion of the worst fever-district, the population is 145 per acre, which we may compare with Fitzwilliam Ward, part of which nearly touches on the fever-district, where the population is but 52 per acre. It thus appears that the great bulk of the fever of Dublin occurs on the south side of the city. To this side I shall confine the rest of my remarks with regard to the details of the distribution of fever, and the localities whence the Cork Street Hospital patients are derived. This portion of the inquiry will consist of three parts: (1) the districts where fever prevails; (2) the streets which furnish the largest number of patients; and (3) the homes of the patients. With a view of making the inquiry as complete as possible, I have taken into consideration the streets which have furnished fever-cases during the past ten years; but, as it would be of little practical utility to know the exact locality where fever prevailed several years ago, I have only gone minutely into the inquiry for the two years ending September 30th, 1871. This inquiry embraces the south side of the city only, which I may call the Cork Street Hospital fever-field; while the north side may be called the Hardwicke Hospital fever-field. Some cases of fever pass from the south side to the Hardwicke Hospital; and some—perhaps a greater number—come from the north side to the Cork Street Hospital; but practically, Cork Street gets all from the south, and Hardwicke all from the north side. The same allowance has also to be made for the cases admitted into Stevens's, the Meath, Sir P. Dun's, the Adelaide, and City of Dublin Hospitals. These act as disturbing causes, especially each in its own locality, and, of course, impair the accuracy of some of the results as marked on the map; but they will not, I think, affect materially my conclusions as to the distribution of fever on the south side of the city. This inquiry extends over two years, and embraces investigation into the circumstances connected with 1,825 cases of fever (including only simple, typhus, and enteric fevers) derived from 1,190 houses, and from 266 streets, lanes, courts, and alleys. Although an inquiry into the distribution of scarlatina, small-pox, and other forms of contagious febrile diseases would be of great interest, yet, as these diseases are less within the control of sanitary measures than the continued fevers (small-pox excepted), and as it would tend to complicate the present inquiry, I have excluded these from consideration in this paper, and confined my attention to the continued fevers only.

On looking at the marked portions of the map on which I have marked the fever-houses with red dots, any one well acquainted with the south side of the City of Dublin will at once see that the fever-streets are naturally distributed among three districts, and these districts are not only naturally divided by the lie of the city, but also by the nature and age of the streets and houses contained therein, and, what is more important for our present purpose, by the prevalence of fever in each.

The south side of the city may be divided into four districts by two lines of streets. Of these, three are fever-districts—the north-east, north-west, and south-west. The fourth—the south-east—may be said to be free from fever, except a small portion south of Lower Mount Street, which might fairly be included in the north-east division. For my present purpose, I shall name three districts as follows: 1. Coombe Valley (south-west division); 2. West River (south-east division); 3. East River (north-east division). I have numbered these in accordance with the prevalence of fever in each, the first furnishing by far the largest number of cases. Each of these districts has some outlying districts, to which I may have to refer again. Besides these, there are certain places outside the south city, from which a considerable number of cases are derived. There are also several public institutions which send cases to Cork Street Hospital. The East River district is lower lying, and, therefore, less easily drained than the West River, but has the advantage of being more open to sea-breezes and fewer nuisances; for, although the vitriol-works are objected to by some, yet I think these must be considered as rather wholesome than injurious, as they are constantly diffusing disinfectants through the neighbouring atmosphere. So much for the districts. I shall next consider the distribution of fever through these districts. I have divided the houses furnishing fever-cases into three classes; namely, 1. Those furnishing five or more cases during the two years ending September 30th, 1871; 2. Those furnishing three or four cases; 3. Those furnishing one or two cases only.

From the table I now show, it appears that the bulk of the fever-

cases are furnished from the Coombe Valley district. While the average proportion of fever-cases to each fever-house is nearly the same in each district, the proportion of fever-houses per street is much greater in the Coombe Valley than in the other districts, being 5 per street against 3 and 2½ in the West and East River districts respectively, showing that the fever-houses are more closely set together in the former than in the two latter districts. The proportion of bad fever-nests to fever-houses generally is less in the Coombe Valley than in the West River district, and about equal to that in the East River; and this is also true of houses furnishing three or four cases: thus showing that the cases are more concentrated in individual houses in the two latter than in the former district. In fact, fever is more equably and closely distributed over the Coombe Valley than the other districts.

We have now to consider the streets, lanes, alleys, and courts whence the fever-cases come. The streets are generally characterised by being composed of old—many of them once fashionable—houses, with bad rear accommodation, or no back yards at all. It is not essential, as many suppose, that fever-streets should be narrow and tortuous; on the contrary, two of the worst fever-streets—Meath Street, the very worst, and Francis Street—are wide and straight. It is the age and condition of the houses, and proximity of narrow courts and alleys that especially characterise these streets, together with the want of proper house-drainage, ash-pit, and privy accommodation in the houses themselves. As examples of the worst fever-streets, I may mention Meath Street, with its 95 houses, 36 or more than a third of which furnished in all 73 cases of fever to Cork Street Hospital during the two years. It contains one fever-nest furnishing six cases, and ten others furnishing three or four cases each. Francis Street, with 140 houses, has 28 fever-houses furnishing 55 cases; there are in it two fever-nests furnishing more than five cases, and a house furnishing three or four cases each. The Coombe contains 129 houses, and has 46 fever-houses furnishing 78 cases, one house furnishing five cases, and four others furnishing three or four cases each. These are sufficient detailed examples of fever-streets, but I could mention many others nearly, though not quite, as bad. The lanes and alleys are probably more than the streets, but must be merely looked upon as streets on a smaller scale. The courts (comprising yards and squares) are most to be considered. These are perhaps the most prolific fever-beds, as few of them have failed to produce fever-cases during the past two years. Fever-streets are generally skirted by these courts, notably those which I have already given as special examples of fever-streets. There are several kinds of courts: (1) those originally constructed as such; (2) those closed up at one or both ends; and (3) back yards and gardens that have, by the cupidity of the owners, been built upon, the out-offices being converted into dwelling-houses, thus crowding together a large number of small tenements in a very cramped space. These latter are generally known by the name of yards, or are only designated by the number of the house behind which they are situated. Few people, besides clergymen and medical men, are acquainted with the existence of these places.

Examples of the first form of court may be found in abundance off South Great George's Street and King Street, and a considerable number in the neighbourhood of Townsend Street. They are, in fact, narrow blind lanes, and have usually an open sewer running down the centre through the whole length, and emptying itself into the adjoining street, or into a trap near the entrance to the court. These traps are frequently choked, and large quantities of sewage accumulate. There is usually a privy, seldom more than one, situated in each of these; as also in the other form of courts, the drainage from this privy of course finds its way down the open sewer already described in the centre of the court. The square may be considered as the best of these forms of court examples, of which are Gell's Square, off Cole Alley; Neil's Court, off Marrowbone Lane; Doby Square, off Nicholas Street, etc. These squares have usually no drainage, and are surrounded by miserable, old, overcrowded houses, and are generally strewn over with rubbish and filth, consisting to a great extent of human ordure, and have one or two cesspools near the centre. I have already indicated the nature of the yards, several of which may be found in Marrowbone Lane, Cork Street, and the Coombe. The houses in all of these are of the most filthy character, and the front house or houses to the street generally indicate the nature of what is behind, having the usual character of a fever-nest, to which I shall presently refer more particularly. The ground of all these courts is saturated with decomposing organic matter, chiefly human excrement.

I have already pointed out that the houses from which fever-cases have been derived number 1,190, with a few more added since my list was made out; in round numbers, 1,200 of these houses furnished 1,825 cases, with some additional ones not included in the classified list, making in all, in round numbers, 2,000 cases. Of these infected houses,

41 furnished five or more cases each; the nature of the cases furnished by each are put in Table 6; again, 81 houses furnished three or four cases, which are particularised in Table 7; the remainder of the houses furnished but one or two cases each.

The analysis of these tables give the following result :—

53 houses furnished		3 cases each.	
28	"	4	"
16	"	5	"
12	"	6	"
2	"	7	"
3	"	8	"
1	"	9	"
2	"	10	"
2	"	11	"
1	"	17	"
2	"	doubtful.	

122

The total number of cases furnished by these 122 houses was 534, or more than a fourth of the whole number, showing how prolific these fever-nests are, and how much they endanger the health of the community, which is particularly suggested by 48 of these houses having fever-houses next door to them. The kind of fever furnished by these houses is an interesting point. Of the houses furnishing five or more cases—

13 houses furnished cases of		three kinds of fever.	
19	"	"	simple and typhus.
4	"	"	enteric and simple fever.
4	"	"	typhus and enteric.
2	"	"	simple only.
0	"	"	typhus only.
0	"	"	enteric only.

This shows that the most infected houses, as a rule, furnish more than one form of continued fever, proving that any one case of fever occurring in a house should at once direct the attention of the sanitary authorities to that house, with a view of arresting its spread, and the probable production of all kinds of fever. It is far from improbable that many of these houses which have furnished but one or two cases of fever are just commencing their career as fever-nests. I may mention that several of these fever-nests have also produced small-pox, scarlatina, measles, and cholera; of the last, I may mention the notorious house, 22, City Quay, where cholera first made its appearance in 1866.

What are the characters of a "fever-nest"? The best way to answer this question is by describing one or two. I shall begin with the worst on my list, 58, Bridgefoot Street, now celebrated as a fever-nest, defying the sanitary authorities. This house is entered from the street by a passage with a black and rotten floor, in which are open chinks communicating with the cellar below; the boards are damp and sodden with dirt; going upwards, we find things somewhat better, but the whole upper part of the house is dilapidated; going downwards, we first come to the entrance to a small back yard, a place covered ankle-deep with human filth, a privy and ash-pit totally unapproachable without passing through a sea of dirt, a water-tap running and washing such of the dirt as is within reach into a pipe-sewer which runs through the cellar of the house, and which has a hole in it, through which the sewage passes into the cellar, converting it into a cesspool. This cellar was immediately beneath two rooms inhabited by a family of fifteen, every one of whom had enteric fever. In the same street I found another house with all these characters repeated, except the broken sewer, but this house had no sewer at all—a house in Chancery Lane, which furnished eight cases of fever (seven of typhus and one enteric). I was met on entry by a horrible stink, proceeding partly from a filthy back yard, and partly from slaughter-house at the rear of a neighbouring house in Bride Street. The cellar of this house had been filled up, a very proper measure if rightly carried out, but the filling-up material consisted of such material as to fill the cellar with a decomposing manure-heap. The passage, back yard, and upper part of the house were similar to those already described at 58, Bridgefoot Street. I find similar conditions, varying, only in degree, in almost every fever-nest. The less prolific fever-nests I find with less accumulated dirt, and notably less wet dirt. In many places where there was comparatively little dirt, what did exist was made to do the maximum amount of damage by being kept in a continued state of moisture, for want of proper drainage, or from drainage-water from the roof or elsewhere running into the house by the doors, or through imperfectly or not at all closed cellar-openings. These damp cellars, often nearly filled with rubbish, are to be found in all fever-streets and most fever-houses. Many houses have no receptacle for rubbish except the cellars; this is particularly true of corner houses

and houses near corners, many of which, if not public-houses, are fever-nests.

We have next to consider the remedies for this state of things; these may be easily summed up in three words—cleansing, draining, and clearing. I believe the only cure for many of these places is a complete clearance of the ground. I consider that all closed courts should be abolished, either by an opening up to the main street, or by complete demolition of the houses themselves. Perfect house-drainage should be insisted on; all cellars should be filled up with dry mineral materials; all privies and ash-pits should be cleansed by the authorities—not left to be done by the owners, who will not, or the occupiers, who cannot do it. The person receiving the rent from the occupier should be made responsible for the proper sanitary conditions of the house; no excuse should be taken about the existence of another landlord. All tenement-houses should be regularly inspected, not by policemen, whose fellow-policemen often own or farm these houses, or collect the rents, but by proper and well qualified health-officers, and no better could be found than the dispensary medical officers. Houses where fever has once occurred, should be constantly watched and reported upon. Street-lists of infected houses should be kept, such as I made when I undertook this inquiry.

Three preventive measures seem to me to have been altogether neglected. In Dublin, no proper sanitary organisation seems to exist; there is but one health-officer, and he is badly paid; the sanitary inspectors are policemen, who go to inspect the houses of their friends; and the reports of infected houses by the hospitals and dispensary medical officers are systematically ignored until they are sent to the newspapers; but as these are matters of public notoriety, which have now gone for months without any public contradiction, I shall not further refer to them, but appeal to my professional brethren to use their influence with the public to compel the authorities to do their duty, and prevent the spread of contagious diseases in our city.

ON A REGULATED TEMPERATURE IN THE TREATMENT OF DISEASE, ETC.

By ALEXANDER ROBERTSON, M.D.,

Physician to the Town's Hospital and City Parochial Asylum, Glasgow.

AMID all the changes in medical opinion regarding the therapeutic value of the agents with which we seek to conquer disease, none have sustained their time-honoured reputation so well as heat and cold. Without exaggeration, it may be said that, in one or other of the modes in which they are employed, they are of universal application, and that their power in alleviating pain and in promoting the restoration of health is acknowledged by all. We appear, however, to be only now beginning to form a proper estimate of their exceeding importance as remedial agents in certain forms and stages of disease. In illustration of this remark, I need only refer to the observations which have been recently made on the reduction of hyperpyrexia in febrile conditions of the system, due to various causes, by means of the cold bath. In this direction, a wide field seems to be opened up, which promises richly to repay the labours of many explorers.

In the beginning of this year (February), when considering the different classes of remedies employed by medical men in the exercise of their vocation, I was forcibly struck by the fact that these agents, heat and cold, as they are used through the medium of poultices, fomentations, and cooling lotions of various kinds, are not, as a rule, prescribed with any attempt at precision. To take the case of the poultice: it is clear that its temperature often differs widely, according to the skill and care exercised by the nurse in its preparation. It is also equally evident that, though applied as warm as the patient can bear it, before long it parts with its excess of heat. But, so far as I have been able to ascertain, no exact observations have hitherto been made to determine the length of time during which it retains a temperature higher than that of the part with which it has been in contact, and how soon a renewal of the application is required. No certain indication can be gathered from the practice of medical men in treating similar conditions of disease; for some order fresh poultices every hour or two hours, while others are contented with having them changed three times a day.

Similar observations may be made with equal propriety regarding fomentations. However, they are usually changed more frequently than poultices; though, upon the whole, there is not much greater uniformity in practice.