

visitation system, as contrasted with its course in other districts of the same town not under active medical visitation.

The first epidemic seizure of Inverness was limited to 20 cases of choleraic diarrhoea; I could not ascertain that another case had occurred. The first ten cases all proved fatal from not applying for aid sufficiently early. The last ten cases were brought immediately under treatment, and all recovered.

Most large cities would furnish similar illustrations, but I shall select one from the Barony parish, Glasgow. The Parkhead district of that parish is a circumscribed one, so that the population could be placed under comparatively strict inspection, and so efficiently were the measures carried out, that throughout the entire epidemic the premonitory cases amounted to no less than 2379 per cent. of the Cholera cases. On some days the premonitory cases were to those of developed Cholera in the proportion of 3000, 3300, 5900, and even 6000 per cent., and the result on the Cholera, as will be seen by referring to Table IV. and the diagram (plate 7), was the complete breaking up of the disease, leaving entire days during which all the cases appeared in the premonitory schedule only, to which it was indeed confined with a few exceptions during the whole month of February. The Report on Manchester gives similar facts.

Where the conditions have been favourable for the experiment, the results have been as stated; but it has happened in circumscribed districts where the sanitary conditions have been exceedingly defective, and where the attacks ran their course with great rapidity, that the visitation system has not produced such results as those now detailed, and for the obvious reason, that there was no marked premonitory stage against which it could be brought to bear. In these last instances, the entire dispersion of the people, provided it had been practicable, would have been the only safe course. If the defective sanitary conditions which are connected with rapid attacks cannot be removed from the people, the people must be removed from the cause. There is no other remedy.

In large cities, as has been already stated, the conditions for a full experiment do not exist. All that could be done was to use the visitation system to drag as many as possible out of the fatal grasp of the epidemic. Upon the whole then, though, from the nature of the case, the *exact amount* of good effected by the preventive methods adopted cannot be ascertained with precision in every instance, no mind open to the reception of evidence can doubt that much suffering was prevented and a large amount of human life preserved. There is abundant proof that an effect was produced on the whole statistics corresponding to that which was so strikingly apparent in all those cases where a proper groundwork for this kind of evidence existed. In the reports on the towns will be found the opinions of medical men who actually witnessed the practical results of the preventive measures, and these, along with the statistical evidence, are sufficient to settle the question as to their entire efficiency when zealously carried into operation.

## SECTION IV.

## SPECIAL REPORTS ON TOWNS.

## I.—REPORT ON THE PREVENTIVE MEASURES adopted for the Relief of CHOLERA IN DUMFRIES during the EPIDEMIC of 1848-49.

I HAVE elsewhere given an abstract of the causes which make Dumfries and Maxwelltown liable to attacks of epidemic disease; some of these are peculiarly of a topical character, but all, so far as I can perceive, admit of removal. There were, however, certain very obvious localizing causes of cholera, which might have been removed before the epidemic began. These had all been pointed out in the published notifications of the General Board of Health, and in the circular of the Board of Supervision, but the efforts made to abate the evils alluded to were so partial that nothing really effectual had been done. While the disease was committing the most frightful ravages there were still numerous offensive middensteads and pigsties: a filthy state of the affected districts, and no houses had been cleansed or limewashed. The medical arrangements were most defective, there was no proper dispensary relief, no house of refuge, and the Parochial Board of Dumfries had broken up the system of medical relief they had previously sanctioned, and left the town to the mercy of the pestilence at a time when between 20 and 30 deaths a day were taking place out of a population of 10,000.

In consequence of several applications having been made to the General Board of Health, by persons in authority in the town, I was directed, by telegraph, to proceed from Glasgow to Dumfries. I did so immediately, and arrived on the afternoon of the 6th December, 1848. In the course of the evening I conferred with the authorities and the remaining medical officers, from whom I received information as to the condition of the town and the nature of the epidemic seizure, and ascertained that, while diarrhoea was almost universally prevalent, every case of cholera had been preceded by a distinct premonitory stage of some duration. I also met the Parochial Board, and requested that a messenger might be despatched to Glasgow and Edinburgh for more medical aid, which was done before the meeting broke up. Having only been a few hours in the town, the information I had received was necessarily incomplete, and next morning I resumed the inquiry. I very soon found that matters were in a much worse position than had been previously represented to me, and that it would be necessary to obtain special regulations to enforce the carrying out of specific measures to meet the existing emergency. The diarrhoea was spreading with frightful rapidity; the existing medical staff was entirely inadequate for the purposes of prevention which I contemplated, and was, moreover, beginning to suffer, and there appeared an absolute necessity for collecting a large additional number, and turning their whole energies to searching for and treating the disease in its premonitory stage. In the course of the day (the 7th) I drew up and despatched the neces-

sary information to the General Board of Health, and the committee of the Parochial Board agreed in the mean time to send for a sufficient number of medical men to carry out the work.

The following abstract of Reports forwarded to the Board will show the nature of the various steps taken and the results which followed:—

*Dumfries, Dec. 9, 1848.*

In my letter dated the 7th instant, I pointed out the neglect with which the regulations of the Board had been treated, and showed, that up to the period of my arrival, no proper steps had been taken in the way of cleansing, providing a house of refuge, and organizing a proper system of medical relief. Since that date the following course of procedure has been agreed to by the Committee of the Parochial Board.

1st. The committee has given orders for appointing a proper cleansing staff to undertake the needful operations in all houses where disease has been, or is likely to appear.

2nd. A house of refuge has been opened this evening, and has twelve beds ready to be disposed of.

3rd. Steps have been taken for obtaining an adequate supply of medical attendants on the sick. When cholera appeared there were nine resident medical practitioners in Dumfries, whose services were accepted by the Parochial Board, and afterwards dispensed with on account of some pecuniary consideration, and apparently without a thought as to the probable result to the poor. Two were eventually employed, and two strangers from neighbouring parishes were brought to the town. A great amount of work was thrown on these four individuals, and, as a consequence, one of them is dangerously ill with cholera in Dumfries, and another was seized at Lockerby, a town about 12 miles distant, where he is at present ill. The disease is supposed to be cholera. Fortunately I had induced the Parochial Board to send to Glasgow for assistance on Wednesday night last, and had this not arrived in time to be put in operation to-day, there would have been *only two* medical men to attend all the cases. Such was the state of things up to this morning.

One of the gentlemen now ill is surgeon to the gaol, which has been deprived of his services at this critical period. I saw a case of premonitory diarrhoeal symptoms, another case of inflammation, and another of phthisis, all requiring attention, and dependent on casual medical aid, within the gaol, on visiting it to-day.

The remaining medical men of the town have all suffered more or less from the epidemic, with two exceptions. One is ill with cholera; two are unable to work from premonitory diarrhoea with which they have been attacked; another is suffering, it is feared, to a fatal extent, from the effects of over-exertion on a weakened frame;\* so that, instead of the four resident medical men, whom I stated as likely to act, two only remain. Of the two strangers who were brought to town one will apparently die of cholera. This is one of the two cases mentioned above.

\* This gentleman, Dr. McLachlan, died on the forenoon of the 10th December, of a rapid attack of cholera.

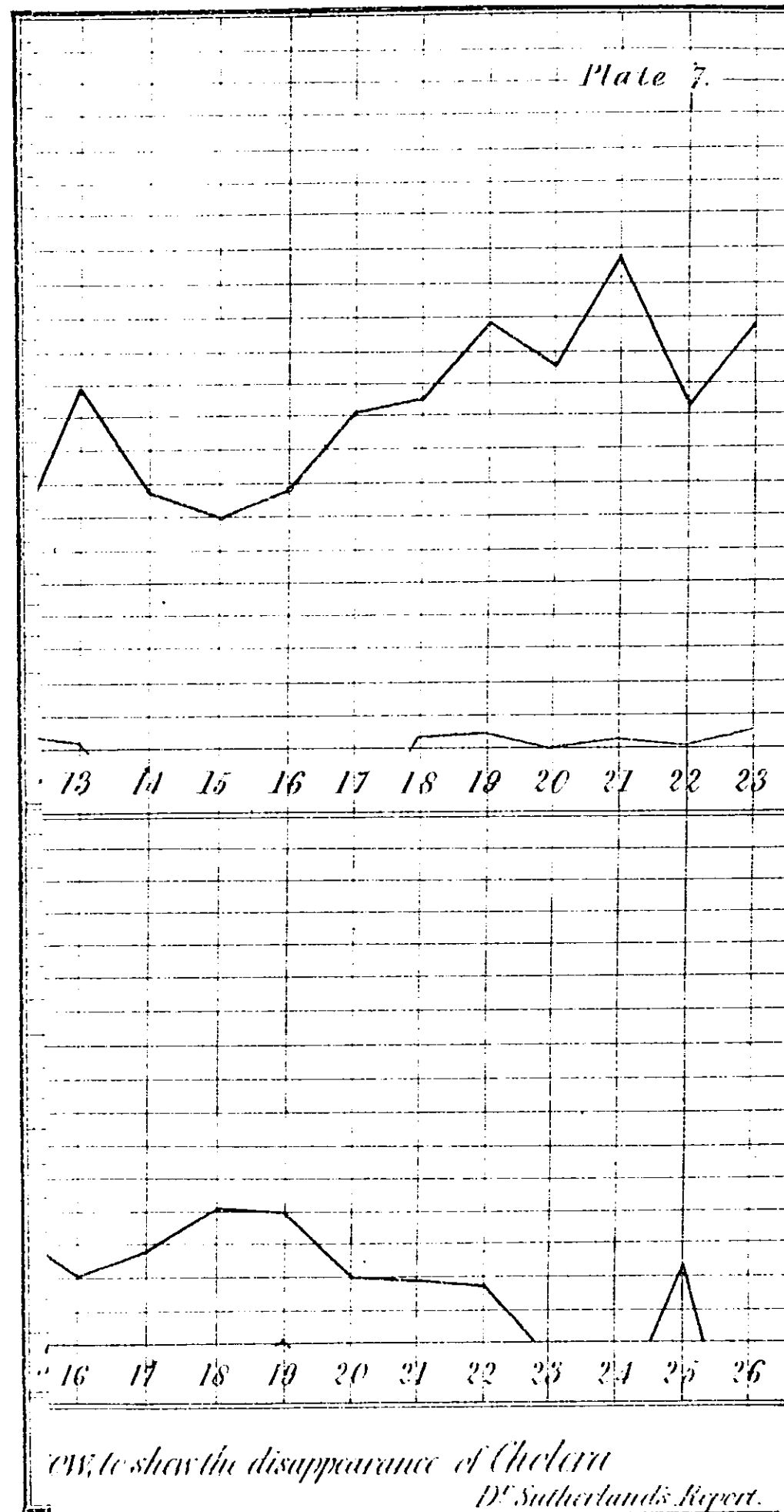




Diagram of Premonitory Cases and Cases of Cholera, in N<sup>o</sup> 1, District Barmy Parish, Glasgow, to show the disappearance of Cholera under the Preventive Measures. Dr Sutherland's Report.

The disposable staff this morning, as has been said, was two. Other three have arrived from Glasgow, and have been through their districts this evening. Another is on the way hither. After much discussion, the Committee of the Parochial Board agreed to accept the services of the remaining two medical officers. I have thought it advisable that they should act as superintendents of the town. One half has been allotted to each. They will be ready to attend consultations when called on; to advise generally with the medical staff; to look after the statistics; and to see that the directions of the Board are acted on. The disposable staff to-night amounts to seven—five district surgeons and two consulting officers—and another district surgeon will, I hope, arrive in the course of the night. This staff, however, is not sufficient, and eight additional qualified practitioners will be obtained as soon as possible. I am desirous of using this large number as a preventive medical police over the town. Their duties will be—1st. House-to-house visitation, and the administration of remedies on the spot where needful. 2nd. The treatment of cases of cholera. 3rd. The carrying out rigidly all the regulations of the General Board of Health which are binding on parochial surgeons.

*Dumfries, Dec. 14, 1848.*

SINCE last I had the honour of reporting to the General Board of Health on this subject a great improvement has taken place, and, so far as time and opportunity have permitted, the regulations of the General Board have been carried out. The chief defects I formerly complained of were the want of an efficient medical staff, neglect of cleansing, and the want of a house of refuge. The amendments which have taken place are as follow:—

1st. The town has been divided into nine districts, and a tenth or landward district has been added.

2nd. To the management of these there have been appointed, up to the present time, thirteen district surgeons and two superintendents, making a staff of fifteen in all. I consider the present arrangement, when coupled with the diminution of cases, as being sufficient for the various preventive purposes contemplated, especially as I have enjoined on the medical officers, in the printed document herewith sent, the necessity of applying for more medical aid whenever needed.

The duties which the medical staff is required to fulfil will be sufficiently apparent from the printed documents already referred to. I believe they comprehend all that the General Board of Health require by their various regulations.\*

3rd. The Parochial Board is proceeding actively with legal processes for removal of nuisances.

4th. The cleansing of streets is better done, and the use of the fire-engine is called in for cleansing closes, &c.

5th. A sub-inspector and two additional officers have been appointed by the Parochial Board. The duty of the first of these is to superintend all cleansing operations, especially the cleansing, whitewashing, and fumigating of houses. An active house-cleansing staff has been formed, and proper books are being prepared in which to enter all orders for

\* These instructions are given in the Appendix.

cleansing issued by the medical officers, and also the date when they were obeyed. The sub-inspector appears to be an intelligent active man, and I gave him special injunctions as to his duties, and pointed out their supreme importance.

6th. A house of refuge has been open since Saturday night last, and has already received a number of inmates.

7th. Four or five druggists' shops are open during the day, and two during the night, to dispense medicines to all necessitous persons.

8th. I have drawn up the accompanying printed document, headed "Important Notice," a copy of which will be left at every house in Dumfries; and it is to be hoped that, along with the influence of the ministers of religion of all denominations, who have willingly come forward to lend their aid, this document will act beneficially in removing popular prejudice, and in smoothing the way for the "medical inspectors."

Lastly. It having been represented to me, that it was customary to draw the only water supply of the town from a portion of the river immediately below the outlets to the common sewers, I have used my influence to put a stop to this most injurious and unnecessary practice, and with success.

Dumfries has now the advantage of a well-organised, and, so far as I can at present judge, an efficient system of medical and preventive police; and I look forward to the result with feelings of no ordinary interest.

*Dumfries, Dec. 20th, 1848.*

THE Reports which I have had the honour of laying before the General Board of Health in regard to the epidemic cholera, recently prevalent in Dumfries, have related chiefly to the deficiencies in the arrangements made by the local authorities for meeting the disease, and the progress which has, from time to time, been made in the adoption of effectual preventive measures. It now becomes my duty to report on the working of the system laid down by the General Board of Health, by its special regulations of the 9th December, and to inform the Board of the very remarkable results which have ensued. Before doing so, however, it will be necessary to give some details as to the history of the epidemic.

The first case of cholera reported occurred on the 16th November. The disease progressed slowly for a few days, and a system of medical relief, apparently well adapted for meeting it, was first agreed to, and then broken up, by the parochial board. The lamentable consequences which followed on this act have been alluded to in previous Reports, and another result was, that no accurate reporting of cases could be carried out. The only record of the progress of the disease was kept by the inspector of the poor, from such data as he could obtain; the bulk of the resident profession having refused to report cases, in consequence of the manner in which they had been treated by the parochial board. The following table gives the aggregate number of cases entered on the book, up to the period when our machinery was so far advanced as to enable us to obtain accurate daily returns:—

Date.	New Cases.	Date.	New Cases.
November 16	1	December 1	13
" 19	2	" 2	33
" 20	1	" 3	31
" 21	4	" 4	22
" 22	6	" 5	17
" 23	6	" 6	23
" 24	2	" 7	13
" 25	3	" 8	14
" 26	4	" 9	6
" 27	12		
" 28	6		172
" 29	18		82
" 30	17		
	82		254

The total deaths reported up to the last date was 86.

These returns, however, are far short of the truth, as I shall presently show; but I am sorry to say that there are no data in existence from which anything but an approximation to it can be obtained.

Wherever I have yet been engaged in Scotland in the exercise of public duty, I have found similar difficulties. The registration is in a most disgraceful condition; or, rather, to speak more correctly, there is no registration of deaths or diseases at all. In some cases the names and dates only are kept in a common pass-book, in which they are entered from hardly readable scraps of paper prepared by the sexton. I have met with cases where absolutely no record is kept. The ground is opened, the body is interred, and the name forgotten. All this is most discreditable to the intelligence of the present age. Even in Dumfries, the chief town of a Scottish county, it is impossible to obtain accurate information as to the ravages of a mortal epidemic, which, within one short month, has carried off above 250 of its inhabitants! The extent of this great public calamity is absolutely unknown; and so far as preventive measures for the public safety depend on obtaining the necessary knowledge, they cannot be put into execution.

It appeared desirable, however, to obtain as close an approximation as possible to the truth, and for this purpose the following steps were taken:—

There are three places of interment in Dumfries: 1st, St. Michael's; 2nd, St. Mary's; 3rd, St. Andrew's (Catholic chapel). The number of cholera cases, recorded as such in the two latter places of interment, are known; but in St. Michael's there is no such record kept. To arrive at an approximate result, the total burials from November 15th, 1847, to November 14th, 1848 (a year), were taken. They were found to amount to 259, which number, divided by 12, gives a monthly average of about 22; and this, moreover, is the number that was buried in the month between the middle of November and the middle of December, 1847. It may therefore be taken as a fair monthly average. Next,

The burials in St. Michael's churchyard for a month from November 16th to December 15th, 1848, were as follows:—

Date.	Burials.	Date.	Burials.
November 16	2	December 1	13
„ 17	1	„ 2	13
„ 18	3	„ 3	16
„ 21	4	„ 4	25
„ 22	1	„ 5	15
„ 23	2	„ 6	10
„ 24	2	„ 7	12
„ 25	4	„ 8	13
„ 26	6	„ 9	12
„ 27	6	„ 10	16
„ 28	7	„ 11	7
„ 29	8	„ 12	14
„ 30	7	„ 13	11
		„ 14	9
In November	53	„ 15	4
		In December	190
			53
Total for One Month . . .			243
Deduct the Monthly Average.			22
Total presumed Funerals of Cholera Cases . . . . .			221

On inquiry at Maxwelltown, the only other locality in the neighbourhood where the disease prevailed, I found that between the dates specified above, eight burials had been sent from that town to St. Michael's.† These, therefore, have to be deducted, so that the actual number amounts to 213 from Dumfries alone.

The cases marked as cholera in the sexton's book at St. Mary's church, which is done by the primitive expedient of drawing a line below the name, are the following:—

Date.	Burials.	Date.	Burials.
November 28	1	December 7	3
„ 29	1	„ 8	3
„ 30	1	„ 9	3
December 2	2	„ 10	3
„ 3	3	„ 11	2
„ 4	3	„ 12	2
„ 5	4	„ 13	5
„ 6	2	„ 14	3
		„ 15	1
	17		
			25
			17
Total Cases buried at St. Mary's .			42

\* This information was copied from a dirty scrap of paper in the possession of the sexton, the only "Register" of the burials during the month at present in existence.

† The dates of removals from Maxwelltown are—Nov. 30th, 2; Dec. 5th, 1; 8th, 1; 10th, 1; 13th, 1.

‡ In the burying-ground of St. Andrew's Catholic chapel, only one case of cholera was interred.

In addition to the burials in the town of Dumfries, a number were carried to country parishes. The precise amount cannot be ascertained, but I have found that up to the 15th December, six cases were interred in the churchyard of Troquer, and seven were sent by hearses to more distant localities.

The whole number who had died of cholera in Dumfries would, therefore, stand as follows, if the data be considered trustworthy:—

*Calculated Burials of Cholera.*

Cases in St. Michael's churchyard . . . . .	213
Registered ditto in St. Mary's . . . . .	42
Ditto ditto St. Andrew's on Nov. 25th . . . . .	1
Carried to Troquer churchyard* . . . . .	6
Ditto other parishes † . . . . .	7
Total . . . . .	269

This, then, is the approximate number of victims carried off by the cholera in Dumfries within the first twenty-nine days of the existence of the epidemic—an appalling mortality for so small a population (about 10,000).

I arrived in Dumfries on the 6th December, and up to that date I believe that no fewer than 147 persons had already been buried, after having been struck down by the epidemic. The Board is aware that I collected a staff as quickly as possible, arranged the districts, and put everything in motion; but this process required further time, equally precious with that which had been irretrievably lost: and it appears from our returns, that it was not until the 13th of December that any material effect was produced, and by that day 250 people had been consigned to the grave.

The details of the plan carried out, in accordance with the instructions of the General Board of Health, have been already given in my second Report, and it is now with much gratification that I proceed to state the results.

The medical staff arrived by degrees, and was instantly located, and instructions as to the house-to-house visitation given. The thing was new, and required a little delicacy and practice to carry it out; but I am truly glad to say that the duties were entered on with great zeal and ability.

No sooner was the preventive force in full activity, than a remarkable change took place in the statistics. This is shown by the following daily returns made at 5 P.M., at the meeting of the Medical Board. The first was on December 10th.

\* The dates of burial are—Dec. 2nd, 1; 3rd, 1; 4th, 2; 11th, 1; 15th, 1.

† The dates of removal are—Dec. 7th, 1; 10th, 1; 12th, 2; 13th, 1; 14th, 2.



	Date.	New Cases.	Deaths.	Recoveries.
	December 10	37	9	..
	" 11	38	6	5
	" 12	23	9	9
	" 13	11	7	2
	" 14	14	3	5
	" 15*	12	6	2
	" 16	8	6	10
	" 17	4	4	5
	" 18	2	5	1
	" 19	4†	5	..
	" 20	..	3	2

These results appeared to me to be so very remarkable, that I requested the medical officers of the several districts to give me a short statement of their experience, of which the following is an abstract:—

*First District.—Medical Inspector, Mr. John Rowbotham.*—"Found the first day 14 cases of diarrhœa, two of which became cholera, the rest were checked without any bad symptom. In going round my district since, I have found five others, all of which have been treated favourably. With the exception of these the district has continued quite healthy."

*Second District.—Medical Inspector, Mr. William McGill.*—After stating, that on the day on which he entered on his duties he had three cholera cases to treat, and that since that time he had had only four new cases, Mr. McGill says, "This freedom from disease I can only attribute to my daily visitation from house to house in the district, as I have met with a very great number of cases of diarrhœa and premonitory symptoms, which, in many instances, I am quite satisfied would have terminated in cholera had they not been arrested in proper time. The gradual decrease of cholera in this as well as other districts throughout the town, is due, I am confident, to the excellent arrangements laid down in regard to the daily visitation of each house, the duties of which have been so strictly enforced from the medical officers."

*Third District.—Medical Inspector, Mr. McQuaide.*—"On the first day, found six cases of diarrhœa; for the five succeeding days ten more: thinks some of these would have gone on to cholera, as he observed in most of them the peculiar whitish and watery stools, in six instances accompanied by vomiting; succeeded in checking most of them: is of opinion that the system has been completely successful."

*Medical Inspector, Dr. William Marshall.*—"In fact, I believe all these cases (30 in number) would have terminated in cholera had not the strictest attention to prevent this been paid; only one did go on to cholera. All were found during the house-to-house visitation: I consider the plan to have been completely successful."

*Fourth District.—Medical Inspector, Dr. Dickson, Staff Surgeon.*

\* There is a discrepancy between the figures in this table and those in the preceding Tables of Burials, which I do not profess to be able to reconcile.

† Only three of these occurred in the district, and one in the gaol. Two other cases in the rural part of the parish are omitted.

—"I arrived in Dumfries on the 8th December, and since that date have had ample opportunities of noticing the great advantages of the house-to-house visitation here adopted by Dr. Sutherland. On my arrival, our utmost exertion was required for attendance on cases already labouring under the worst symptoms of cholera; and for several days so many were the calls to attend the sick, and so deficient the strength of the medical staff, that no time was allowed for our finding cases of premonitory symptoms. Since the arrival of aid, however, I have, by frequent calls on the people resident in the district under my charge, succeeded in finding many cases of diarrhœa, accompanied with vomiting, and in one or two cases even with cramps. I have had little or no difficulty with such cases, not having lost one patient; and at present I have at least 20 such cases under my care. On my arrival I attended from 15 to 20 cases of cholera a day—this number gradually diminished, and at present I have only one. This I can attribute alone to the fact of my discovering cases of diarrhœa before they had proceeded too far. During my daily visitations, I have discovered on an average eight such cases a day."

*Fifth District.—Medical Inspector, Mr. Ferguson.*—"Found four premonitory cases, but no cholera."

*Sixth District.—Medical Inspector, Dr. Stevens.*—"Has attended 39 well-marked cases of cholera; seen only one in which premonitory symptoms did not occur; by means of the house-to-house visitation, instead of being called to see new cases far advanced in the disease, finds all the cases in an early stage."

*Seventh District.—Medical Inspector, Dr. Fairly.*—"Has seen eight cases of diarrhœa, on an average, per day, most of which have, by early treatment, been prevented from running into cholera; thinks the tendency existed in all; is of opinion that the success of the house-to-house visitation has been most marked in the suppression of cholera."

*Eighth District.—Medical Inspector, Mr. Mac Turk.*—"Has prescribed for 30 cases of diarrhœa, accompanied in two instances with abdominal cramps, and in four with vomiting; has vigilantly pursued the system of house-to-house visitation, with such success, that not a single case of premonitory symptoms has passed into cholera; as far as he has been able to observe, thinks this preventive system has been completely successful."

*Medical Inspector, Mr. William S. Craig.*—"Has prescribed, on an average, for between eight and ten cases of diarrhœa a-day, none of which, with one exception, ran into cholera."

*Ninth District.—Medical Inspectors, Mr. Fife and Mr. Henry J. Carleton.*—"Have attended several new cases of cholera, and numerous cases of diarrhœa and premonitory symptoms, which we have no doubt would, in many instances, have terminated in cholera, but for the early treatment they were subject to, resulting from the well-organized plan of house-to-house visitation." Mr. Fife states, "that he has been engaged in visiting cholera cases, since its appearance in Dumfries, in most parts of the town, under different arrangements of the parochial board; but little benefit resulted either in the treatment or arresting the disease until the house-to-house visitation was put into full operation."

The two medical superintendents of the town, *Mr. Bluchlock* and *Dr. Grieve*, state that, "in their opinion, the great and decided advantage of such a plan as that which has been carried out in Dumfries, is placed beyond a doubt by the extraordinary results of the experiment."

The chief points in this unanimous testimony in favour of the preventive system are, the great prevalence of cholera in its premonitory form; the necessity for seeking out such cases by a house-to-house visitation; the ease with which the premonitory stage may be overcome; the advantage which it affords for detecting true cholera cases at an early period of their course, by which the patient's chance of recovery is vastly increased; and lastly, the important practical conclusion which appears to follow, namely, that by a well-organized system of this kind it may perhaps be possible to retain cases in their early stage, and to deal with them then.

As an illustration of the extent to which diarrhoea prevails, the following returns for the districts may be given:—

Districts.	CASES OF DIARRHOEA.		New Cases from 5 P.M., 19th, to 5 P.M., 20th Dec.
	Total under Treatment, 19th Dec.	New Cases since 5 P.M. of 18th.	
1st . . . . .	7	2	1
2nd . . . . .	8	4	4
3rd . . . . .	12	3	3
4th . . . . .	16	4	4
5th . . . . .	..	..	8
6th . . . . .	6	2	..
7th . . . . .	12	5	4
8th . . . . .	12	2	5
9th . . . . .	6	3	2
Private cases . . . . .	13	5	1
Total under treatment, Dec. 19, 1848 }	92		
Total new Cases from 5 P.M., 18th, to 5 P.M., 19th . . . . }		30	32

That a considerable proportion of these cases would pass into true cholera, if left to themselves, is beyond a doubt; and it appears reasonable to conclude, that, by keeping a grasp over those cases, the practitioner has a grasp over cholera itself.

These remarks of course apply only to the modification of the disease, as it exists in Dumfries at present. It has a well-marked premonitory stage, and this fact has been made the basis of the system of medical relief now in operation.

It would be premature to come to any very decided opinion as to the ultimate success of the system. Cholera is a most capricious disease, and our knowledge of the laws of its propagation is too limited to justify absolute certainty in our deductions; but the remarkable fact cannot be overlooked, that, immediately on the house-to-house visitation being fairly brought to bear upon it, the disease, as shown by the returns, diminished rapidly; and with this fact before me, and

also the very strong reports of the medical staff to support it, I have deemed it my duty to delay no longer in reporting to the General Board of Health on the subject. Since the above was written, another report has been given in, from which it appears that within the last 24 hours no new case of cholera has declared itself. In the town of Dumfries there are not half a dozen cholera cases *under treatment*, and it is only the doubt which a first successful experiment tends to generate, which prevents me from designating this as one of the most successful attempts at the application of preventive measures ever made, and I trust that some method will be adopted for applying a similar remedy to our large cities when suffering under epidemic disease.

P.S.—The return of the 21st December gave six new cases of cholera, the circumstances of which were so remarkable as to deserve special notice, from their affording another kind of proof of the value of the system of house-to-house visitation. Five of them occurred in private practice, and all had had neglected premonitory symptoms, while the sufferers, from their position in life, did not come within the sphere of the medical visitors, whose duties were confined to the poor. The remaining case was that of a man who, in spite of all warnings, got so intoxicated on the preceding day as to require two men to take him home. This last case cannot properly be taken into the general account, and the visitation thus kept the districts free, while persons in the better-conditioned parts of the town suffered.

#### APPENDIX TO REPORT ON THE MEDICAL RELIEF OF CHOLERA IN THE TOWN OF DUMFRIES.

*On the Nature of the Premonitory Cases treated in the Districts, up to Dec. 29, 1848.*—As it appeared to be a matter of extreme importance to ascertain the precise nature of the premonitory cases discovered and treated in the several districts of the town, in order to form some estimate of the value of the preventive system, in dealing with cholera as an epidemic, a request was made to the medical inspectors to furnish the required information, of which the following is a digest:—

*In District No. 1, Mr. Rowbotham* states, that he has had "upwards of 20 cases of diarrhoea, 10 or 15 of which I believe would have terminated in actual cases of cholera, but for their being early found during visitation, and proper treatment employed."

*In District No. 2, Mr. William McGill* states, that he has treated above 40 cases of diarrhoea. "In about 12 of these the symptoms have been pretty severe: vomiting, purging, and cramps in about nine; and in the remaining three, vomiting, purging, and partial suppression of urine without cramps."

*In District No. 3, Mr. Owen M'Quaide* says, "I have had about six cases of simple diarrhoea, that is, without rice-water stools, some of which, I think, if not treated early, would have gone on to the rice-water stool; all the rest of the cases of diarrhoea, about 30, had their



specific rice-water stools, and in eight of these cases there was vomiting but no cramps."

*Dr. William Marshall*, of the same District, states as follows:—"In 50 cases which I have attended since the 11th (Dec. 1848), I had 20 which I consider would have gone on to rice-water stools, three with suppression of urine, 47 without suppression, 20 with rice-water stools, and 12 with vomiting and cramps."

*In District No. 4, Dr. James Dickson* reports, "I have kept no record of cases of diarrhoea, but have treated upwards of 60, and feel assured that 40 of those would have gone on to undoubted cholera, had they not been treated early. I have no deaths among such cases. I have to add, that in all those cases of diarrhoea alluded to, suppression of urine did not exist; but in the majority there was vomiting, in many cramps, and in a few coldness of the extremities."

*In District No. 5, Dr. Macknight* states, "that he has had about 40 premonitory cases with vomiting and purging," and goes on to say, that "the recoveries were in consequence of immediate medical assistance being afforded." *Mr. Fergusson* has attended, in the same district, 28 cases of premonitory symptoms, and only two cases of cholera.

*In District No. 6, Dr. Steven* reports, that the cases of diarrhoea, and other abdominal affections, not cholera, were about 40 or 50; and that the number of cases with opalescent stools did not exceed half a dozen. "These," he says, "were so from the time they attracted attention. Not another assumed that character after being put under treatment."

*In District No. 7, Dr. Fairly* says, he has no notes of the exact number of cases of diarrhoea which he has treated, but that he has only had "two cases in which the true opalescent stools were present; and in both these cases, they (the rice-water stools) were present when I first saw the patients. All the others I succeeded in checking before they passed into that stage of the disease."

There is no special report from *District No. 8*, but *Dr. Burgess*, who appears to have been employed in this district latterly, states, that since the 20th December he has had 27 cases of diarrhoea; 14 of these were visited before the rice-water purging commenced, and in four there were rice-water stools. *Dr. Burgess* says, "in my opinion, the great majority, if not the whole, would have gone on to cholera had I not been called in time."

*In District No. 9, Mr. Fife* says, that since cholera first appeared at Dumfries, he has attended a great number of cases of diarrhoea in all parts of the town, and that latterly the stools became of a rice-water description, but vomiting was absent in almost every case. *Mr. Carleton*, in the same district; says, "I have kept no register of diarrhoea cases, but to the best of my recollection I have treated upwards of 30. Of these, more than one-half had the characteristic rice-water dejections, and I have no doubt a considerable number of these would have terminated in cholera but for the active treatment which was put in force. I state this with confidence, from the experience I acquired in Leith when cholera raged there. I have to add, that in one or

two there was diminution of urine, although it did not amount to suppression."

Several of the medical officers state that they have seen characteristic cases of cholera without suppression of urine, but that in the great majority that symptom was present.

The experience in Dumfries has been most instructive and important. It goes to prove that there is a unity in the disease, from its first manifestation of slight abdominal symptoms of various kinds, onwards to severe diarrhoea, next to rice-water purging, vomiting, cramps, and other severe symptoms, and thence to developed cholera, with or without the suppression of urine, according to the intensity of the diseased action, although, for statistical purposes, it appears requisite to assume empirical data, as characterising the various periods of the disease. The practical conclusion must be self-evident, namely, that the only means of dealing with cholera as a pestilence, is the immediate organization in every locality threatened by the disease, of a staff of visitors to go from house to house, for the purpose of discovering and treating on the spot the slightest diarrhoeal symptoms. It has been proved by melancholy experience, both in Dumfries and Glasgow, that neither rich nor poor will, of their own free choice, apply for medical aid until the time for its efficient exercise is either past, or the chances of recovery reduced to a very small proportion. The premonitory diarrhoea is, in a large number of cases, attended with sensations rather agreeable than otherwise; the sufferer is lulled into a fatal security, and no alarm is consequently taken till it is too late.

Glasgow, January 4, 1849.

In addition to the preceding reports, I beg to subjoin the following table of all the premonitory and cholera cases which occurred in the districts from the beginning to the end of the house-to-house visitation. It exhibits in a very striking manner the relation between the amount of premonitory cases discovered, and the rapid transference of the statistics of cholera into those of diarrhoea, so that evidences of the natural decline of the epidemic are to be sought for, not in the column of cholera, but in that of the premonitory cases. Cholera generally takes place by sudden outbursts, gradually diminishing in intensity as the epidemic dies away. It will be seen that this is precisely what occurs with the premonitory cases in the table.

I believe that very few of this latter class of cases escaped the visitors; that hardly any that were discovered passed into cholera, and the obvious inference is, that the cholera cases reported in the latter part of the table must have been either sudden, imported, the result of obstinate personal neglect, or of intemperance. To one or other of these causes is to be attributed the remnant of cases which appears in the schedule, while the great bulk were arrested.

In order to make the data in the table more striking to the eye, I have placed them in the diagram Plate 8 (see Report, p. 99), where the black line represents the premonitory cases and the red line those of cholera.

The evidence in this instance as to cause and effect is as strong as the case admits of, and I think perfectly conclusive.

RETURNS of Premonitory Cases and Cholera in the Town of Dumfries, during the House-to-House Visitation, 1848-49.

DATE.	Number of Visitors.	Premonitory Cases.		Cholera.			DATE.	Premonitory Cases.		Cholera.		
		Premonitory Cases Discovered.	Total under Treatment.	New Cases.	Deaths.	Recoveries.		Premonitory Cases Discovered.	Total under Treatment.	New Cases.	Deaths.	Recoveries.
1848.							1848.					
Dec. 10	1	..	..	37	9	..	Dec. 30	25	84	2	..	..
" 11	2	..	..	38	6	5	" 31	3	38	2	..	..
" 12	4	..	..	23	9	9	1849.					
" 13	12			11	7	2	Jan. 1	10	51	..	1	1
" 14	13			14	3	5	" 2	8	50	3	..	..
" 15	13	Premonitory Cases discovered.			12	6	2	" 3	9	28	..	..
" 16	13	Average from 33 to 40 a day.			8	6	10	" 4	15	42	..	..
" 17	13			4	4	5	" 5	3	28	..	..	2
" 18	14			2	5	1	" 6	3	18	..	..	2
" 19		30	92	3	3	..	" 7	3	16	..	..	..
" 20		32	..	..	3	2	" 8	7	25	..	..	1
" 21		24	80	..	2	6	" 9	4	17	..	..	1
" 22		27	79	..	3	..	" 10	..	10	1	..	..
" 23		23	71	2	1	..	" 11	..	..	..	..	..
" 24		22	72	..	2	2	" 12	1	7	1	..	..
" 25		3	50	2	2	1	" 13	2	13	..	..	..
" 26		11	55	1	1	..	" 14	2	14	..	..	..
" 27		12	52	2	2	..	" 15	1	11	..	..	..
" 28		18	49	2	..	..	" 16	2	15	..	1	..
" 29		8	36	3	..	2						

## II.—REPORT ON THE MEASURES ADOPTED FOR THE RELIEF OF CHOLERA IN GLASGOW DURING THE EPIDEMIC OF 1848-9.

### Section I.—Preventive Measures.

ON or about the 5th of November, 1848, an imported case of cholera occurred in Glasgow. The patient, a working man, had gone to the village of Loanhead near Edinburgh, where the disease was very fatal, to visit a relative who died from an attack. He remained only a few hours in the village and returned to Glasgow, where he was taken ill in a house in Garngad-road to the north of the city. This case proved fatal, but none of the attendants suffered, neither was there any connexion between it and the subsequent epidemic seizure.

Nearly two miles to the west of this locality, there is a district that may be considered the epidemic centre of Glasgow. It is a straggling suburban village situated to the north-west of the city, and an inexperienced eye might fail to detect those peculiarities which render it a dangerous neighbourhood. It lies along the Forth and Clyde Canal, which is here carried at a high level, and the moisture percolates through the bank, so as to keep the whole subsoil charged with water, which accumulates in middensteads and other hollows. There are besides several old quarries filled with offensive water, and other similar

nuisances. The houses have neither drainage nor domestic conveniences and the inhabitants consequently habitually breathe an impure and unwholesome atmosphere. Similar conditions have always accompanied the most violent epidemic outbursts in other places, and from this one unhealthy neighbourhood, three epidemics had commenced their career within a short time before the cholera began.

Late at night on the 11th November, two individuals, a male and a female, residing on the ground flat of a damp house in the district, close to the canal were seized with severe diarrhoea, which they both allowed to go on unchecked till the 13th. The medical officer on being called in found the man in a state of profound collapse, in which he died next morning. The woman then fell into collapse, and also died. Both of these cases were purely epidemic, for neither of the patients had been near any one affected by the disease. Simultaneously with the occurrence of these cases in the part of the district within the city parish, another case appeared in the portion belonging to the barony parish, which proved fatal on the 13th. On the 14th, 15th and 16th three other cases took place in this last-named portion, and on the 17th the third case in the city parish occurred at the village of Springbank, situated below the level of the canal, and at a considerable distance from the first two cases. This patient, a man of dissipated habits, had neither been in an affected locality, nor had communication with any one suffering under the disease. A number of cases took place within a few days after this date, and Dr. Adams the parochial surgeon of the district, states, that no communication could be traced between the parties, and that 21 cases actually occurred before he saw an example of two persons *consecutively* attacked in the same house, or even in the same lane. The succeeding nine cases took place without communication; so that the evidence goes to show that the disease was purely epidemic in its appearance. In 13 instances relatives lay in the same bed with the sick without being affected. In 9 cases, children were suckled by women labouring under the disease, and yet not one of them was attacked.

The epidemic was chiefly confined to this locality during the remainder of the month of November, and about 40 cases took place in the neighbourhood, before the disease began to show itself in the more densely peopled parts of Glasgow. A few dropping cases nearly equally scattered occurred in the urban districts of the city and barony parishes, for some days before a decided epidemic outbreak took place.

From Springbank and its vicinity the epidemic appears to have spread, as from a centre, towards the east, west, north, and south. On the 5th of December a case occurred south of the Clyde, and on the 9th a case was reported in the west end of Glasgow; and within a few days after this period, the epidemic attacked the whole city, falling upon it like a thunder shower, producing results that baffled all calculation, and setting all existing arrangements at defiance. The maximum period of the attack extended from the 24th to about the 29th of December, the largest number of deaths occurring probably on the last of these days; for on the 30th no fewer than 158 burials, of persons stated to have died of cholera, took place. A subsidence next occurred for a day or two, but immediately after the dissipation of the new year, as was to be expected, a vast augmentation again ensued, and on the 5th of January

no fewer than 235 cases were reported. From this period the disease declined irregularly; the continuity of the epidemic was broken about the 8th of March, after which only a few dropping cases occurred over the city; but the disease lingered longest in the epidemic centre of Springbank, which furnished about a third of all cases that occurred in the 23 parochial districts after the preventive measures had been withdrawn on the 26th of February.

The peculiar liability of Glasgow to attacks of epidemic disease has led to the adoption of an extensive and well-arranged system for the medical relief of the poor. The city parish is divided into seventeen districts, and the urban and suburban parts of the barony parish into six districts, and over each of these divisions is appointed one medical officer who has an open dispensary at which the poor apply in cases of sickness. There is extensive hospital accommodation for epidemic disease. The Fever Hospital in Clyde-street is capable of receiving 200 cases, and that attached to the Infirmary, from 200 to 250 cases; but the distance of these establishments from many of the localities affected by cholera rendered it necessary to open other two temporary hospitals, each capable of containing 12 beds. One of these was situated at Woodside and the other at Bridgeton at the opposite extremities of Glasgow.

In compliance with the regulations of the General Board of Health, the city parochial authorities opened a House of Refuge in Clyde-street, capable of accommodating 280 persons, and another was opened at Bridgeton by the barony parish. This latter had beds for 200 inmates.

The violent outbreak of cholera in the town of Dumfries rendered it necessary for me to proceed thither before the arrangements in Glasgow were completed. I had, however, previously made an attempt to organize a system of house-to-house visitation by lay agency, and by the aid of the City Missionaries, but without success.

As soon as the very striking advantages of the system of medical visitation carried out in Dumfries, in conformity with the special regulations of the General Board of Health, became apparent, I was instructed to organize a similar plan in the affected parts of Glasgow. I, accordingly, conferred with the parochial authorities and their medical officers. All parties seemed desirous to give the system of visitation a fair trial, and, after due consideration, I deemed it expedient to base the preventive measures on the existing system of medical relief, rather than to lose time by organizing another machinery. The two parishes affected had 23 medical officers in their employment. The places of business of these officers were well known to the people, and could be at once converted into district *day* dispensaries for the relief of persons affected by diarrhoea or other premonitory symptoms; and I found that arrangements could easily be made by which an adequate number of night dispensaries could be opened at convenient distances from each other. The arrangements might have been more effective had the district surgeons given their whole time and attention to cholera cases, but this was impossible.

The annexed map exhibits the arrangements adopted. It shows the boundaries of the 23 districts, the position of the day and night dispensaries, the cholera hospitals and Houses of Refuge; and it also points out the centre from which the epidemic radiated, and the chief localities

affected. The extent covered by the epidemic is indicated by the diagonal lines, and its force by the comparative proximity at which the lines are placed.

In casting the eye over the map, the different sizes of the districts are very striking. They may be taken as the exponents of the sanitary and social condition of the people. The present arrangement is the result of experience, and speaks volumes as to the misery, vice, and disease which are concentrated within small spaces in our larger cities and towns. The healthy districts cover the largest spaces of ground, and have their poorest classes and neighbourhoods at considerable distances from each other; yet the labour of the medical officer is not greater in superintending such large areas of population, with all the time spent in going over them, than it is in those frightful abodes of human wretchedness which lay along the High-street, Saltmarket, and Briggate, and constitute the bulk of that district known as the "Wynds and Closes of Glasgow." It is in these localities that all sanitary evils exist in perfection. They consist of ranges of narrow closes, only some four or five feet in width, and of great length. The houses are so lofty, that the direct light of the sky never reaches a large proportion of the dwellings. The ordinary atmospheric ventilation is impossible. The cleansing, until lately, was most inefficient, and, from structural causes, will always, under existing arrangements, be difficult and expensive. There are large square middensteads, some of them actually under the houses, and all of them in the immediate vicinity of the windows and doors of human dwellings. These receptacles hold the entire filth and offal of large masses of people and households, until country farmers can be bargained with for their removal. There is no drainage in these neighbourhoods, except in a few cases; and from the want of any means of flushing, the sewers, where they do exist, are extended cesspools polluting the air. So little is house-drainage in use, that on one occasion I saw the entire surface of a back yard covered for several inches with green putrid water, although there was a sewer in the close within a few feet, into which it might have been drained away. The water supply is also very defective; such a thing as a household supply is unknown, and I have been informed, that, from the state of the law, the water companies find it impossible to recover rates, and that, had the cholera not appeared, it was in contemplation to have cut off the entire supply from this class of property.

The interior of the houses is in perfect keeping with their exterior. The approaches are generally in a state of filthiness beyond belief. The common stairs and passages are often the receptacles of the most disgusting nuisances. The houses themselves are dark, and without the means of ventilation. The walls dilapidated and filthy, and in many cases ruinous. There are no domestic conveniences even in the loftiest tenements, where they are most needed, except a kind of wooden sink placed outside some stair window, and communicating by a square wooden pipe with the surface of the close or court beneath. Down this contrivance, where it does exist, is poured the entire filth of the household or *flat* to which it belongs, and the solid refuse not unfrequently takes the same direction till the tube becomes obstructed. In Edinburgh it is no unusual thing for the whole refuse, solid and fluid, to be tossed out of the windows into the closes below, and this in spite of Acts of

Parliament and police regulations centuries old. The necessities of nature are stronger than any police laws, and will always set them successfully at defiance.

I have met with cases where the sights and smells in all parts of the house were sickening, and, in one instance, a decent poor man stated, that the interior of his house was so very wretched, that he shut the window-shutter of his only window in order that his feelings might not be injured by the neighbours casting a passing look through it.

Another matter connected with these districts, and their peculiar liability to epidemic disease, is the great and continually increasing overcrowding that prevails. I have been credibly informed, that for years a population of many thousands has been annually added to Glasgow by immigration without a single house being built to receive them. The great proportion come from Ireland. Every cabin in that wretched country that is razed to the ground sends one or more families to find house-room in the cities of England and Scotland, and of this element of disease Glasgow obtains its full share. A great proportion of these poor people are young men and women in the prime of life. They come from the fresh country air, and a diet just sufficient to support health in it, to inhabit for a time those wretched dens of misery, disease, and death, the low lodging-houses. It is only, however, for a time; for a diet still further reduced, and a pestilential atmosphere, do the rest. The young and healthy soon become the prey of epidemic disease, and their deaths go to swell the catalogue of those who have been prematurely cut off by typhus. Others again, driven by sheer necessity and the vile examples they meet with, find their way to the prison and the convict ship; and not a few young women virtuously brought up in their native parishes in the Highlands or in Ireland, are seduced, ruined, and abandoned to prostitution and an early grave. Such are the notorious results of the social system at present in operation in Glasgow and other large cities. The over-crowding and wretchedness of late years has brought typhus with it, a disease that not long ago was almost as rare in the large cities of Scotland as ague now is; and wherever typhus has prevailed, there cholera now prevails, or has done so recently.

These observations on the sanitary condition of affected parts of the districts of the *city* and *barony* parishes will give some idea of the localities and habits of the people where the preventive measures for arresting cholera have been put in force, and of the difficulties which had to be encountered. The entire population of the *city parish* is about 152,000, and of the six districts of the *barony parish* about 127,000.

As soon as the arrangements were completed, a code of instructions, drawn up in conformity with the special regulations of the General Board of Health, was printed and placed in the hands of the superintendents and visitors. It will be found in the Appendix.

The visitors employed were advanced medical students, who were selected for the work because it was considered that the peculiar circumstances of Glasgow, being a university city, and the seat of a medical school, would make the system of *student-visitation* easy to carry out, on account of the facility with which qualified young men could be obtained. At a subsequent period an important modification of the plan was effected in a part of the barony parish, by the substitution of lay

visitation. The following details will show the extent of the agency employed in both parishes:—

General superintendents . . . . .	2
District medical superintendents . . . . .	23
Medical visitors, city parish . . . . .	40
Medical visitors, barony parish . . . . .	28
Houses of Refuge . . . . .	2
Cholera hospitals . . . . .	4
Day dispensaries . . . . .	26
Night dispensaries . . . . .	13

The dispensaries were open to all necessitous applicants without any order, and properly qualified medical officers were placed in charge of each night dispensary, and stationed at the various hospitals in readiness to give immediate attention to applicants for relief and reported cases.

A separate notice was printed for each of the twenty-three districts of the two parishes, and extensively distributed in the poorer neighbourhoods. It was intended to give the people full information as to the measures which were being taken for their protection, to disarm prejudice, and to give a few needful cautions in regard to personal habits, and the necessity of attention to the premonitory symptoms of the disease.

As the obtaining of statistical data was of essential importance to the working of the preventive measures, three sets of schedules were provided. The following is the form which was adopted for the use of the visitors:—

## VISITOR'S SCHEDULE.

No. of District.	No. of Sub-District.
Name of Visitor,	
Date,	
Hour visitation when commenced to-day	
Hour visitation when concluded to-day .	
Number of houses visited . . . . .	
New Cases of Simple Diarrhœa, discovered during the visit . . . . .	}
New Cases of Diarrhœa, with Rice Water Purging, discovered during the visit . . . . .	
Cases of Cholera discovered during the visit . . . . .	}
Number of Cases of <i>Diarrhœa</i> or <i>Rice Water Purging</i> , which have passed into Cholera since last visit, distinguishing each separately . . . . .	
Number of Houses reported after the visit as requiring cleansing . . . . .	}
Signature of Visitor.	

The Superintendent of each district met his visitors at a stated hour in the evening, and received from each a copy of this Schedule filled up; he then transferred the aggregate of the details along with certain other information, into his own return, of which a copy is added.

DISTRICT SUPERINTENDENT'S RETURN.

No. of District,  
Name of Superintendent,  
Date,  
Total Premonitory Cases which have applied at the District Dispensaries since yesterday . . . . . }  
Total Cases of Simple Diarrhœa, reported by the Visitors in the District, since yesterday . . . . . }  
Total Cases of Rice Water Purging, reported by the Visitors in the District, since yesterday . . . . . }  
Total Cases of Simple Diarrhœa or Rice Water Purging, which have passed into Cholera in the District, since yesterday, distinguishing each separately . . . . . }  
Total New Cases of Cholera in the District, since yesterday . . . . . }  
Total Deaths from Cholera in the District, since yesterday . . . . . }  
Total Recoveries from Cholera in the District, since yesterday . . . . . }  
Total Cases of Cholera under treatment . }  
Total Houses in the District reported as requiring cleansing, since yesterday . }

Signature of District Superintendent.

At the evening meeting of the District Superintendents, the General Superintendent of each parish took the chair, and a general Schedule, showing the progress of the disease in each separate district, was filled up under the following heads, and a copy forwarded to the General Board of Health :—

GENERAL SCHEDULE for Cases of Premonitory Diarrhœa, and Cholera, in the Parish of Glasgow.

DISTRICTS.	PREMONITORY CASES. Since last Report.			CHOLERA.				Premonitory Cases passed into Cholera.
	Dispensary Cases.	Simple Diarrhœa.	Rice-water Purging.	New Cases since last Report.	Deaths since last Report.	Recoveries since last Report.	Under Treatment.	
1								
2								
&c.								
	Date.			Reporter.				

The second and third columns of premonitory cases comprehend those discovered and treated by the visitors.

Two sets of Schedules were prepared for notifying instances in which cleansing either external or internal was required. Those for street cleansing, the removal of nuisances, &c., were sent to the police; and

the Schedules for the cleansing, lime-washing, or fumigating of affected houses, were forwarded to the cleansing staff of the parishes.

A system of sanitary inspection was introduced into the large manufactories, by the aid of the Secretary of State, with the view of detecting and treating immediately all premonitory cases that might occur among the work-people—a measure that was productive of much benefit.

Besides the spread of the epidemic among the poorer classes in Glasgow, a number of fatal cases took place among persons in the better ranks of life. It appeared that in nearly all those cases a distinct premonitory stage had existed without attracting attention till it was too late, and, in order to prevent such occurrences as far as possible, very strong expressions of opinion as to the necessity of early attention to the premonitory signs, were given at the meetings of the District Superintendents, and reported in the newspapers. But it appeared to be necessary to attract public attention still more forcibly to this matter, and with this view a letter was addressed to the Lord Provost of the city, and with his concurrence inserted in the newspapers.

In one of the districts of the barony parish an attempt was made to carry out the visitation system by a voluntary unpaid lay-agency, but it was soon given up. In another district, however, that of Bridgetown, a local committee of the Parochial Board undertook to provide lay-visitors at 2s. 6d. per diem; the district was divided into four wards, over each of which one qualified practitioner resident in the place was appointed. The population is about 17,000, and 14 lay-visitors were deemed sufficient to undertake the visitation. The medical officer of each ward was required to devote his whole time to the treatment of diarrhœa or cholera cases which might be discovered within his district, and he was also required to do a certain amount of visitation. The whole machinery was under the guidance of Dr. Burns, the District Superintendent, who met the medical officers and visitors every evening, and received from them an account of the work done during the day. A copy of the results was entered in the general daily schedule of the barony parish. Each day the lay-visitors inspected, on an average, 2,500 houses, and immediately reported all the cases of cholera or its premonitory symptoms discovered in the ward to the proper medical officer. They also reported at the evening meeting every house, &c., in the district where cleansing was required. In this way no fewer than 700 courts, lobbies, closes, houses, and fronts of buildings were reported and cleansed; and it was remarked, that Bridgetown had never before been so clean or so free of disease as when the cholera began to decline. No fewer than 413 cases of diarrhœa, and 183 choleraic cases with rice-water purging, were discovered and successfully treated; only two being reported as having passed into cholera.

A soup-kitchen was established in Bridgetown by the local Board of Health; and it is a striking fact, that of all the persons who were recipients of its bounty, not one was attacked either with diarrhœa or cholera. It is remarkable, also, that the factory operatives enjoyed a greater exemption from attacks of cholera than any other class of work-people. This circumstance is attributable partly to the better sanitary condition of the dwellings and places of work of this class of operatives, and partly, no doubt, to the system of inspection which was introduced



into the factories, for the purpose of discovering and treating premonitory cases.

The carrying out of the whole of the parochial relief measures was placed in the hands of the two General Superintendents,—Dr. Lawrie, consulting physician to the city parish, acting for that parish, and Dr. Dempster, undertaking the like duty for the barony parish.

I cannot conclude this part of the report without expressing my high sense of the great ability and energy with which the visitation system was carried out by the medical officers of the Parochial Boards; and of the obligations which the city of Glasgow is under to Dr. Francis Steel for the amount of labour he bestowed on keeping the statistics of the disease; and I think it only an act of justice at the same time to express my conviction that, whether we consider the extent of the machinery employed during the late fearful epidemic or the zeal with which it was sustained by the most active members of both Boards, or the expense cheerfully incurred by them during a period of great pecuniary difficulty in parochial affairs, no provision more munificent was ever made for the relief of a great public calamity, than that carried out by the humane and enlightened citizens of Glasgow. But, while I willingly bear this testimony to the good which has been done, a sense of public duty requires me to express my conviction that those epidemics which have so frequently devastated Glasgow and other cities and towns in Scotland, are not to be met by such temporary measures as those now described. Nothing short of permanent sanitary improvements, of a very different kind from any hitherto carried out, will be sufficient to save the lives of the poor, and to protect the public from the heavy local expenditure arising from preventible disease.

### Section II.—Results of the Preventive Measures.

The objects aimed at by the system of house-to-house visitation introduced into Glasgow were:—

1st. To prevent persons who might not apply for medical aid, even in cholera, from dying without such aid.

2nd. To seek out neglected cases of cholera, so as to bring them under treatment at the earliest possible period, and thus diminish the mortality of the epidemic.

3rd. The discovery and immediate treatment of every case of diarrhoea, in localities where cholera prevailed, and where the patients had not applied at the dispensaries, in order to prevent, as far as possible, the development of the disease.

4th. To keep a constant medical inspection over affected districts and houses, to insure their being preserved in a proper sanitary condition.

5th. To exercise a moral agency over the population, by giving such instructions in regard to cleanliness, ventilation, and personal habits as might appear needful, and by explaining and enforcing the necessity for immediate application to the dispensaries or medical officers by all parties who might be taken ill during the intervals between the daily visits.

I next proceed to show the extent to which these various intentions were fulfilled.

The house-to-house visitation was begun by the student visitors of the city parish on the 26th and 27th December, and by those of the barony parish a day or two later. At this period the epidemic was about its acmé; although in the course of the next week or ten days, a vast number of cases occurred, after the revels of the new year, and in consequence of the drunkenness then prevalent.

The very first result of the visitation was the discovery of a number of corpses of persons who had died apparently without medical aid. In the city parish alone, no fewer than 51 such instances occurred; but there is reason to fear that such deaths were most numerous during the period of the epidemic immediately preceding the introduction of the visitation system, and the burials of these persons have, no doubt, gone to swell the list of those who died either unattended, or of whose illness and medical treatment no record can be obtained.

The visitors also discovered a considerable number of cases of developed cholera. One gentleman stated that, for several days, he had found about a dozen such cases a-day, in none of which he believed the patients or their friends would have applied for medical aid. A very large number of premonitory cases in various stages of progress were also discovered; but as several days elapsed before the necessary schedules could be placed in the hands of the visitors, no account of the earlier cases has been preserved, and it was not until the 31st December, that a regular report could be obtained from all the districts. It was as follows:—

PARISHES.	Applicants at Dispensaries.	Diarrhoea Cases discovered by Visitors.	Rice-water purging Cases discovered by Visitors.	Cholera Cases.
City . .	34	72	13	31
Barony . .	60	72	22	37
Total .	94	144	35	68

The first return thus shows 273 diarrhoeal cases brought under treatment, 35 of which were closely bordering on cholera. As the visitation became more effective, and the people were better acquainted with the objects in view, through the instructions of the visitors and the printed notices issued, the amount of applicants at the dispensaries, and also of cases discovered, progressively increased, the parts of the preventive machinery acting efficiently together.

The early treatment of cases of developed cholera discovered by the visitors produced a very marked effect upon the comparative mortality of the disease. Table I. gives the parochial statistics of the entire epidemic from the first to the last case, and by deducing from it the percentages of deaths and recoveries for each week the following results are obtained. During the first four and last three weeks of the epidemic the number of cases was not very large, and I have therefore grouped them together at each extremity of the table.



	Percentages of Deaths.	Percentages of Recoveries
Four weeks ending December 9 . . . . .	53.4	46.6
Week ending December 16. . . . .	60.5	39.5
"    "    23. . . . .	60.0	40.0
"    "    30. . . . .	51.7	48.3
"    January 6. . . . .	50.0	50.0
"    "    13. . . . .	40.7	59.3
"    "    20. . . . .	34.8	65.2
"    "    27. . . . .	35.0	65.0
"    February 3. . . . .	31.5	68.5
"    "    10. . . . .	37.8	62.2
"    "    17. . . . .	22.2	77.8
"    "    24. . . . .	38.0	62.0
Three weeks ending March 17. . . . .	36.5	63.5

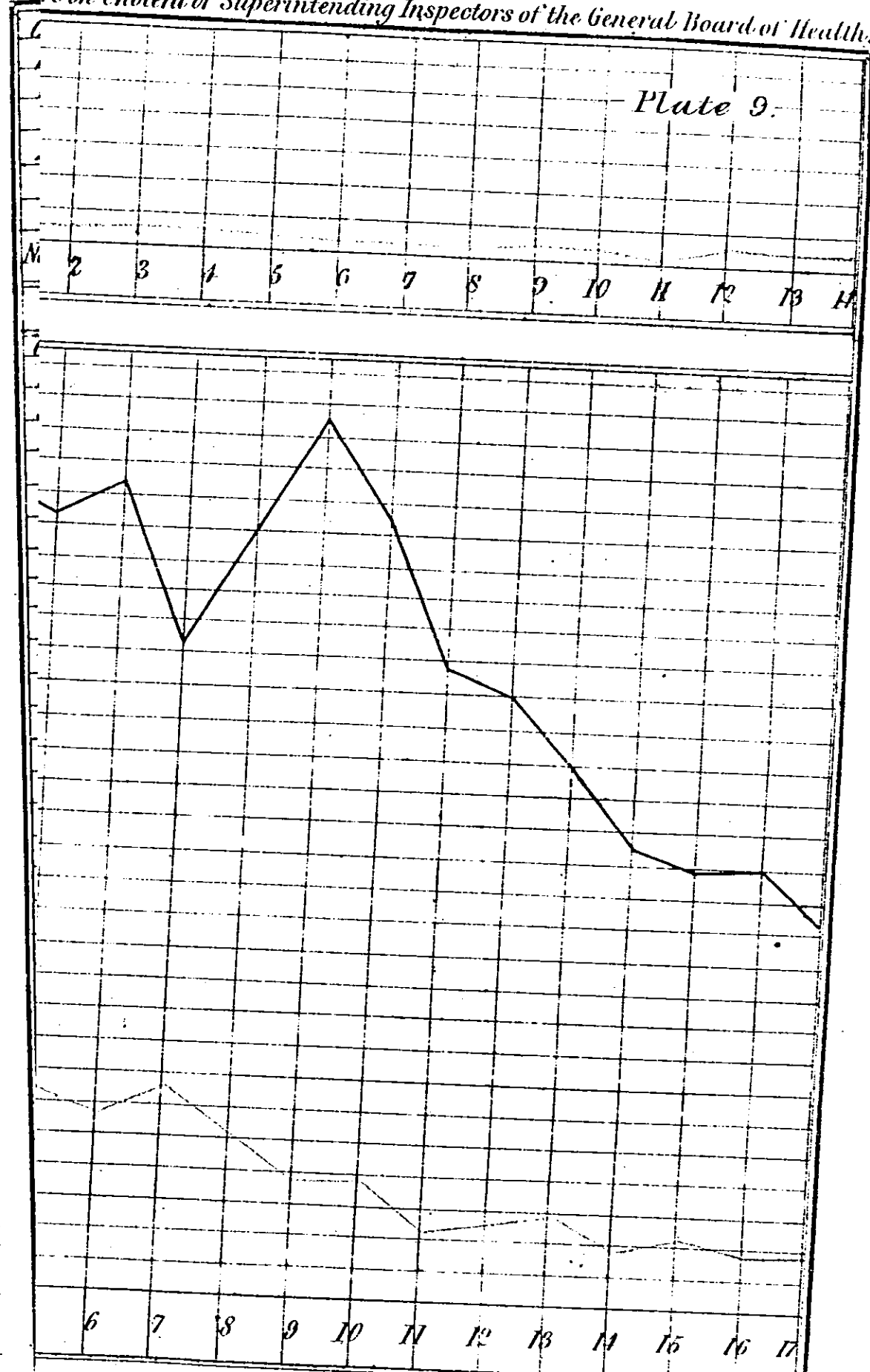
The first neglected cholera cases were discovered by the visitors on the 26th of December, when the epidemic was almost daily attacking new localities. Although it is a law of the disease to decline in severity as it declines in numbers, it showed, certainly, no tendency at that time to do either, and I am, therefore, decidedly of opinion that the greatly diminished mortality which this table exhibits immediately after the introduction of the visitation system, is mainly to be attributed to the discovery and early treatment of the cases. The marked numerical increase of cholera cases shown in Table I. is also to be referred to the same agency. A great number of attacks, of which no record would ever have been obtained except from the burial-ground registers, were discovered by the visitors, and the addition of these to the daily returns is the reason why the statistical effect of the preventive measures was apparently less than it was in reality.\* Table I. gives a daily return for both parishes; and Table II. the total number of cholera and premonitory cases which occurred in each of the districts during the continuance of the system of visitation. I have transferred the daily returns of premonitory cases and cholera for the entire epidemic to Plates 9 and 10, which exhibit in another form the enormous amount of premonitory cases brought under treatment by the preventive measures adopted.

The following are the general results of the preventive measures for the city and barony parishes:—

PARISHES.	PREMONITORY CASES.				CHOLERA.	
	Applicants at Dispensaries.	Diarrhœa Cases Discovered.	Rice-water Purging Cases Discovered.	Total Premonitory Cases Treated.	Premonitory Cases passed into Cholera.	Cholera Cases.
City . . . . .	3,066	2,736	473	6,215	15	1,231
Barony . . . . .	3,113	3,255	506	6,874	12	1,003
Total . . . . .	6,119	5,991	979	13,089	27	2,234

\* As a striking illustration of this fact it may be stated that in the week preceding the introduction of the house-to-house visitation, that is, while the people were left to apply for medical aid, the deaths, as deduced from the recorded burials of persons who had died of cholera, amounted to 829, while the total cholera cases for whom application had been made was only 446, or little more than half the deaths. In the first week of the visitation, when the cases were sought out by the medical officers, their numbers rose from 446 to 714, and the deaths fell from 829 to 699.

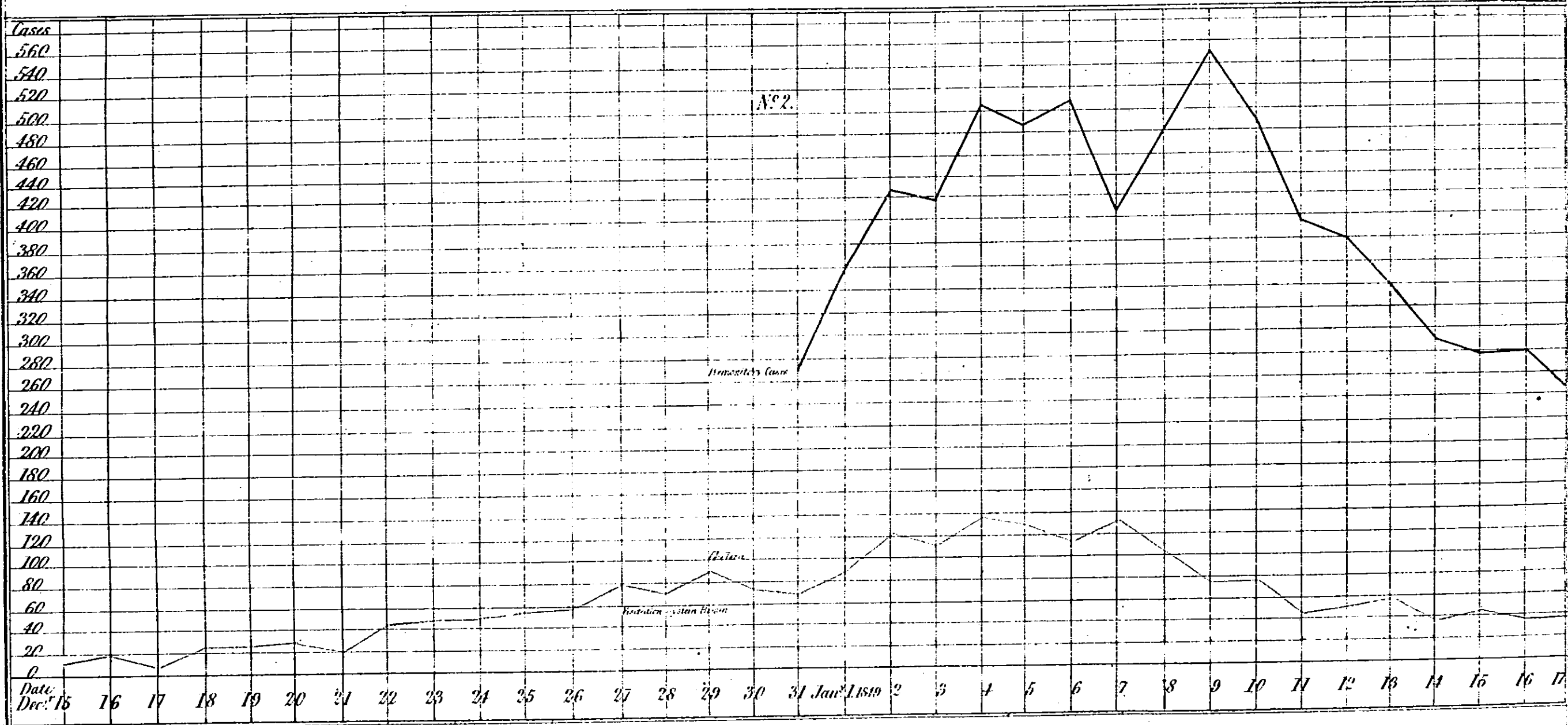
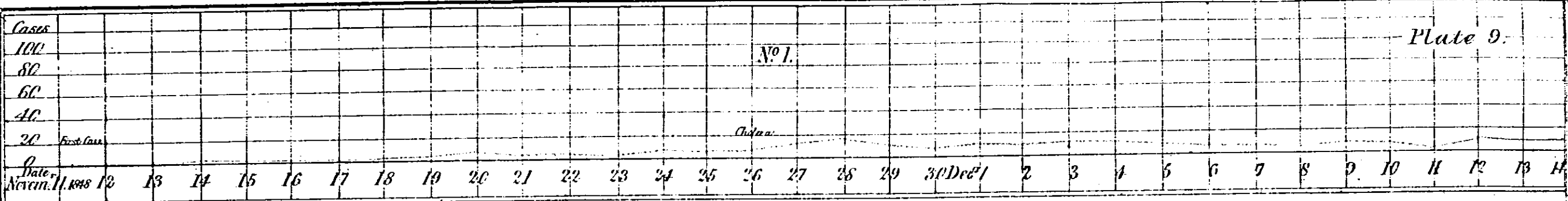
Plate 9.



The City & Barony Parishes, Glasgow, 1848-49.

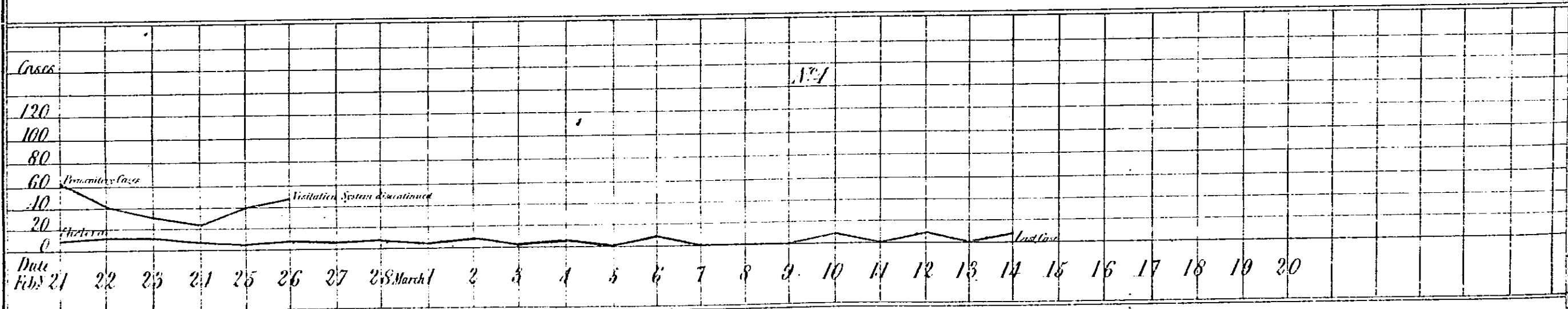
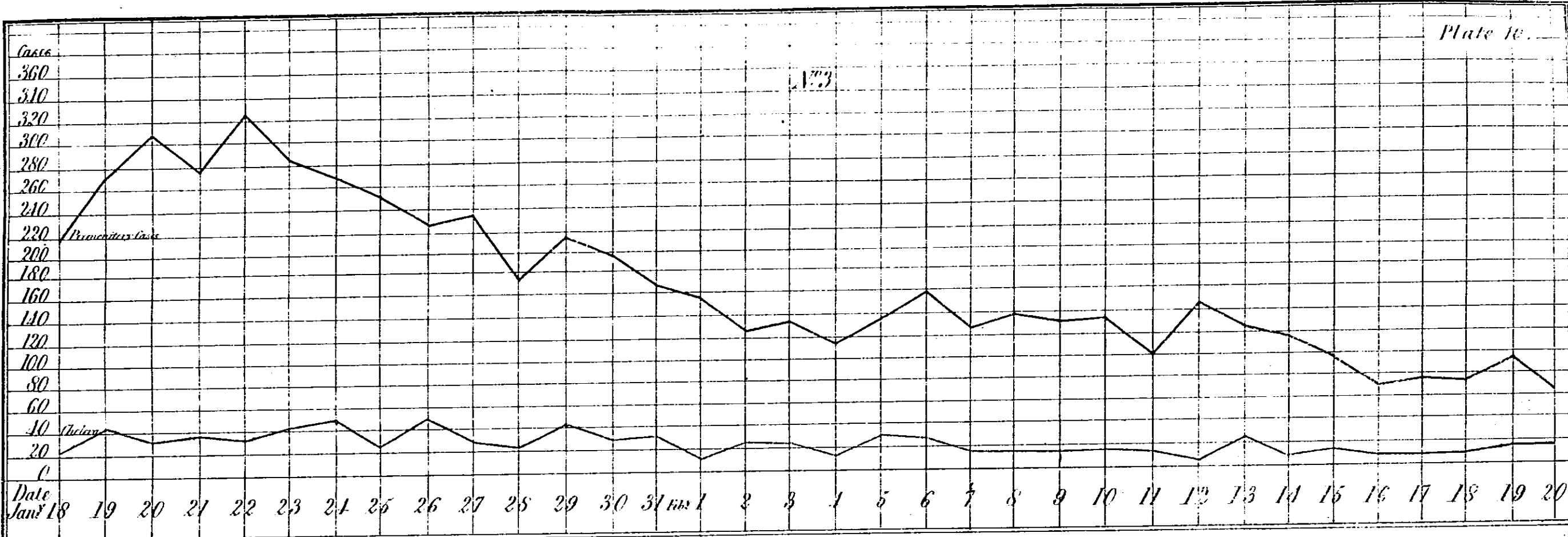
D<sup>r</sup> Sutherland's Report.

Starchan & Co. Litho. London.



Diagrams of the Progress of Cholera, and the results of the preventive measures in the City & Barmy Parishes, Glasgow, 1848-49. Dr. Sutherland's Report.

Forshaw & Co. Litho. London. 22, BULLY STREET.



Diagrams of the Progress of Cholera, and the results of the Preventive Measures in the City and Barony Parishes, Glasgow, 1848-49. (Continued)  
 D. Sutherland's Report.

Continued from Plate 9.

The large proportion of premonitory cases in these tables, when compared with the very small number which passed into cholera, affords a striking and conclusive proof of the utility of directing the treatment against the early stages of the disease.

It is certainly a most remarkable fact, that out of above 13,000 premonitory cases, nearly 1,000 of which had advanced so far as the rice-water purging stage, only 27 should have passed onwards to cholera. Table III., which includes the dispensary cases as well as those discovered by the visitors, shows the ratio existing between the premonitory cases and those of cholera, for each day during the continuance of the preventive measures.

It will be seen that throughout the entire districts under visitation, the proportion of the premonitory to the developed cases amounted to nearly 600 per cent.; in the city districts it was 504 per cent., and in the Barony districts 685 per cent.; but when the districts are taken individually, the proportions are still more striking. They vary from under 200 per cent. to above 2,000 per cent.; and in one instance (Barony District, No. 1.), the premonitory cases amounted to the enormous cypher of 2379 per cent. of the cholera cases. During particular days in the course of the epidemic, a much larger proportion of diarrhoea and other premonitory cases were discovered than during others. This partly arose from the greater comparative success of the visitation, and also partly from the course which the disease happened to take at the particular period. The per centage of premonitory cases on these occasions rose as high as 2,000, 2,800, 3,700, and on one day, in the Barony parish, it was 3,850 per cent. of the cholera cases. The tables and diagrams show that the visitation attained to efficiency during the first week of January, and that the diminution of cholera cases was rapid after that period.

The total number of premonitory cases treated during the continuance of the house-to-house visitation, from December 31st, 1848, to February 26th, 1849, inclusive, amounted as has been stated, to 13,089; and if to these be added the number of unreported cases already alluded to, it is not improbable that about 15,000 such cases were brought under treatment by the parochial medical officers and visitors. During the height of the epidemic, indeed, all Glasgow appears to have been affected. The number of cases treated by private practitioners also was very large. One gentleman prescribed for about 1,100 in the denser parts of the city, and many cases of diarrhoea occurring in the better portions were found to be extremely obstinate in their character. It is to be feared, that among the richer classes, not a few lives were lost by delay in applying for medical aid.

The peculiar difficulties attending the introduction of the preventive measures into Glasgow have been already adverted to, and although the district superintendents bear decided testimony to the zeal with which the student visitors executed their beneficent work, they at the same time complain of the low moral state of the people and of the difficulties which were experienced from this circumstance. I am afraid that much of the mortality which occurred, notwithstanding all that could be done, is to be attributed to the reason referred to. There is abundant evidence to prove that a great many lives were saved, but the statistics of the early history of cholera cases furnished by the superintendents

nevertheless show that out of 1,390 cases, 927, or nearly 70 per cent., had a premonitory stage of more than six hours' duration; in 221, or under 16 per cent., this stage was of less than six hours' duration, or was absent; and in 197, or about 14 per cent., the facts were not ascertained.

There was thus a very large proportion of the attacks which admitted of being brought under treatment at a period preceding the full development of the disease, had the people willingly availed themselves of the means of safety so freely placed at their disposal. All that could be done was to attempt to save as many lives as possible.

I now subjoin the opinions of a number of able and intelligent medical officers employed in the work of superintendence in the city and barony parishes, as to the results which have, in their estimation, accrued from the visitation system.

The first of these is from Dr. Dempster, staff surgeon, who acted as general superintendent of the barony parish. He states that he has served for 23 years in India, and has had ample opportunities of becoming acquainted with the disease, and that the military authorities adopted stringent measures for the discovery and treatment of its earliest symptoms.

"The result of this practice," says Dr. Dempster, "was most satisfactory; and that the measures above stated are absolutely necessary, I feel perfectly convinced from having had so frequently to lament the infatuated carelessness of soldiers, and the lower orders in civil life on several occasions, for days together neglecting the premonitory diarrhoea, and not applying for medical aid until the urgent symptoms of cholera had made their appearance, and then only at a period of the disease when treatment proved of little avail. My experience of cholera, as it occurred in the barony parish during the late epidemic, has only tended to confirm the belief already expressed—that to be of service in cholera, medical aid must be directed against the premonitory stage; and I feel convinced that the only mode of obtaining this favourable end is by the system of house-to-house visitation, as lately introduced into Glasgow. By its means numberless cases of diarrhoea, which would otherwise have been totally neglected, were detected, and, by suitable treatment, promptly arrested: and in the district where the system of medical or lay visitation was most energetically carried out, and the sanitary measures strictly enforced, the good effects were at once manifested in the daily reports, by a great increase of diarrhoea cases, with a proportionate decrease of those of cholera; whilst, at the same time, the proportion of deaths in the latter underwent a considerable diminution, evidently from the visitation system having brought the cases sooner under treatment."

*City District No. 1.*—Mr. John Leitch says, "I am perfectly satisfied that in Glasgow and other large towns, it (the visitation) will not succeed so effectually as in smaller ones, in consequence of the great want of confidence reposed in the visitors." Mr. Leitch, at the same time, states that few, if any, cases of diarrhoea have passed into cholera after having been seen by the visitors.

*District No. 2.*—The following statement is made by Mr. J. Johnston. "Judging from the experience of a fortnight, I have no hesitation in giving it as my opinion that the system of house-to-house visitation has

proved very useful in modifying the progress of the present epidemic. Many cases of diarrhoea have been discovered which there can be little doubt, but for the visitors, would have been allowed to go on unheeded. By the same instrumentality, also, various nauseous nuisances have been caused to be removed, which otherwise might have passed unnoticed."

*District No. 3.*—The superintendent, Dr. John Boag, states that the population, most part Irish, are so exceedingly migratory that "you will scarcely see the same individuals from week to week." He complains, also, of their low moral condition, but goes on to say: "I think the system of house-to-house visitation (although, for reasons I have given, not applicable to the population under my charge) complete as a preventive of cholera in a favourable locality, that is, among a population whose word can be depended upon. I have found this the case so far as the better class of district patients in my district is concerned, but who, I am sorry to say, form a small proportion."

*District No. 4.*—Dr. Alexander Lindsey says, "I have no doubt but this system much assists in preventing the spread of cholera."

*District No. 5.*—Dr. Dickson reports as follows:—"I consider the house-to-house system of great benefit, and that my young men were zealous in the discharge of their duties, and that they also accomplished the work. In country towns I consider it will be of greater benefit than in a city such as Glasgow; but with all the disadvantages it labours under, I have no hesitation in saying that it has been a great mean of preventing cholera by discovering and checking the disease in the diarrhoeal and rice-water purging stages."

*District No. 6.*—Mr. A. Fergus says, "I think that visiting every house is the only plan on which we can place any dependence for checking the progress of cholera. \* \* \* Only one case of diarrhoea discovered by the visitors passed into cholera. The man would not be persuaded he was ill, and refused to take any medicine. At the visit next morning the diarrhoea had passed into cholera."

*District No. 7.*—Mr. James Campbell reports, "Before the commencement of household visitation no cases were seen in my district except those which had passed into cholera. The number of these was about 100. Most of them had had diarrhoea some days, and passed into cholera about the hour of midnight or mid-day. After the visitation system commenced, in one day, if my memory serves me right, 27 cases of diarrhoea were detected, which would next have passed into cholera. \* \* \* At the dispensary, during the past three weeks, upwards of 1000 cases have applied. For some days they were so numerous that the numbers could not be taken. The visitation system and open dispensaries, in my opinion, have been, under the blessing of God, the means of saving many and valuable lives."

*District No. 8.*—Mr. James Glass considers the system of visitation impracticable in the city of Glasgow; but states, at the same time, that not above five cases of diarrhoea have passed into cholera in his district after having been seen.

*District No. 9.*—Mr. J. W. Black, after stating that the visitation system had "not met with that fair play on trial to which it is entitled," on account of difficulties arising from the moral and physical condition of the population in his district, goes on to say that he has much confi-

dence in supposing that whenever it is possible to be put into fair and complete operation success will in general attend it.

*District No. 10.*—Mr. G. Rendall says, "I have just time at present to express my high approbation of the machinery put in motion to arrest the progress and diminish the dreadful ravages of cholera in this city. The maxim, 'Prevention is better than cure,' cannot be better illustrated than in the case of cholera; but I know of no other means so well adapted to the end as the vigorous working of the admirable system which has been instituted. I am not able at present to advert to a single case in which cholera (properly so called) supervened after its premonitory symptoms had been timely and energetically treated. I am as confident that an immense amount of suffering has been prevented and an immense number of lives saved by it, as I am of the truth of any demonstrable fact with which I am acquainted."

*District No. 11.*—Mr. James Harvey reports, "I am of opinion that the present mode of house visitation has been very successful in my district, in finding out and checking cholera in its premonitory symptoms. It has gradually declined, and for the last four days there has not been above one new case of cholera daily."

*District No. 12.*—Dr. Fisher says, "I would answer, unhesitatingly, that I know no more *efficient* agency that could be employed than the visiting of properly qualified students. In my own district (containing a population of between 20,000 and 30,000 inhabitants) *it has worked well.*"

*District No. 13.*—Dr. J. M. Adams states in regard to the visitation, "that in no other way can a large proportion of cases, and especially of the incipient stages of cholera, be brought under notice or under medical treatment; that in the existing state of sanitary arrangements in large towns, it will prove one of the most effectual means of breaking the force of an epidemic, and that under all circumstances it is likely to limit the spread of disease, and to diminish the mortality." After expressing his opinion that the machinery was, to a certain extent, imperfect, he goes on to remark, "But as it is, cases of cholera have been discovered which were fully developed in the symptoms, or were collapsed, or were actually dead, which had not undergone medical treatment, and which would not otherwise have been brought under medical notice; and numerous cases of disorders of the general health, believed to be premonitory of cholera, have been brought under effective medical treatment."

*District No. 14.*—Dr. Walker states, that, on the whole, "the system of visitation does not produce the good it would appear to do at first sight." Although he also states that his visitors are "very zealous, and seem well adapted for the service," and that they "generally stop diarrhœal cases from becoming cholera."

*District No. 15.*—Mr. Menzies says, "Hitherto the system has worked tolerably well, in so far as the diminution of patients in the previously affected localities and their limitation in those then unaffected is concerned. \* \* \* On fully considering the system, as at present applied in the 15th district, I have come to the conclusion, that it has been of very considerable benefit to its population."

*District No. 16.*—Mr. John McElleran reports, "From my experience of the system, I can say that it is a sure and easy method of

checking the progress of cholera, and with total abstinence would render the miasma almost harmless."

*District No. 17.*—Dr. A. M. Adams reports generally in favour of the system, as he then had had experience of it. In a report on the cholera within his district since received, Dr. Adams writes, "The last and, in my opinion, the most important step, taken for the purpose of arresting the ravages of the disease, was the system of house-to-house visitation, instituted about the end of December. In my district this led to the most beneficial effects. During the course of the visitation they (the students) discovered immense numbers of diarrhœal affections. For the treatment of these they carried appropriate medicines, which they administered on the spot. In several instances they learned that some members of the families they were visiting, and who happened to be out at the time, were affected with looseness of the bowels; for these they left simple but efficacious remedies, such as opium, chalk, &c. Of all the diarrhœal cases thus *discovered* and *treated*, one only of a *simple*, and three of a *serous character*, went into cholera." Dr. Adams replies to certain cavils against the efficacy of early treatment in checking cholera, in the following words:—"I have called attention, in another part of this report, to the fact, that many cases of cholera, particularly towards the latter period of the epidemic, were heralded in by premonitory diarrhœa. Is there any one who doubts that the disease can be checked in this stage? I do not think so. My own experience leads me to speak very decidedly upon this point; and it therefore appears to me quite logical to conclude that many of the cases of purging, particularly those of a serous kind, discovered by my visitors, would have lapsed into the worst form of the disease, had they not been checked, as it were in the bud, by treatment. The number of cases of true cholera thus prevented, and the lives saved, cannot even be approximately guessed at, but they must have been very great. With facts of this nature staring them in the face, I cannot conceive on what grounds any individuals, whether contagionists, non-contagionists, or contingent-contagionists, can declaim against such a highly important and efficacious system of prevention."

*Barony Parish, District No. 1.*—Dr. Young says, in regard to the household visitation, "I highly approve of the system."

*District No. 2.*—Dr. Burns states, "in regard to the plan of lay visitation in use, that it seems to work admirably, and to fulfil all that could be contemplated to arise from the scheme. Since the present machinery began its operations, cholera has gradually decreased in quantity and malignity." After remarking on the large number of diarrhœa cases discovered by the lay visitors, Dr. Burns proceeds to state, "that such cases of cholera as occur amongst us are much milder, and pass sooner into a state of convalescence, with fewer deaths; which I attribute to the cases being earlier seen, and sooner brought under active treatment."

*District No. 3.*—Mr. Kirk says, "The system is most efficient, and seems to me to be the only one at all likely to be useful as a preventive during the prevalence of cholera."

*District No. 4.*—Dr. Donald writes, "I have no hesitation in saying, that the system of visitation has done much in arresting the progress of the disease in the district."



*District No. 5.*—Mr. M'Ewan says, "As stated above, I consider the system as one of signal efficacy for the prevention of cholera; and when the people become better acquainted with the visitors, and have entire confidence in their good intentions toward them, I have little doubt cholera will soon disappear."

*District No. 6.*—Dr. Miller writes as follows:—"The concealment of the disease in the stage of diarrhoea renders the system ineffectual as a preventive measure, in proportion to the number of cases concealed; yet still the cases discovered, and treated successfully, have been so numerous, as to leave little source for regret; and, unless cholera is preceded by a peculiar diarrhoea not amenable to treatment, we have every reason to conclude that a large proportion of cases have been arrested in their progress to cholera. That there is nothing distinctive in the diarrhoea which precedes cholera, seems evident from the following considerations:—1st. There is no apparent distinction. 2nd. That the great majority of cholera cases are preceded by diarrhoea of from a few hours to ten days' duration. 3rd. That I have known purgative medicine produce rice-water purging and an approach to collapse. 4th. That during a relaxation in the treatment of a cholera case, when the stools have become feculent or apparently so, I have known the rice-water discharges to return, and the other alarming symptoms."

It has been already stated that a system of inspection was introduced into the factories of Glasgow, as part of the preventive measures, by the Secretary of State, at the instance of the General Board of Health, in order to detect the earliest symptoms of disease, and that medicines were provided to be administered on the spot to all affected persons. This inspection was intended to be the supplement to the house-to-house visitation, to ensure, as far as practicable, that persons who might be from home and engaged at the factories when the visitors called at their houses, might nevertheless be duly watched over. I am happy to state that the results of this procedure were most satisfactory. The reports of the three certifying surgeons, Messrs. Fleming, Stewart, and Cunningham, made to Mr. Stuart, Inspector of Factories in Scotland, show that a large number of premonitory cases were brought under treatment in the factories, and that most of the few cases that did go on to cholera had been neglected by the operatives themselves in the early stage.

Mr. Fleming, while remarking on the increasing number of cases of diarrhoea brought under treatment by this means during the week ending February 10th, states, that "many of these have been so severe, as to cause the persons to leave their work. It is gratifying, however, to state that there has been neither death, nor any well-marked case of cholera, although this complaint has prevailed to a considerable extent in some of the localities in which the factories are situated. I have much pleasure in stating that the medicine left at the factories still continues to give the greatest satisfaction; and that but for it, there is every reason to conclude that many of the cases referred to would have ended in cholera."

Mr. Stewart's district appears to have been comparatively free of disease during the period of inspection.

The following extracts from Mr. Cunningham's reports will show the beneficial results arising from this measure. He says, "It is also worthy of remark, that an improved state of feeling is still on the in-

crease amongst them" (the factory operatives). "Fear has to a considerable extent been supplanted by a confidence that danger may in a great measure be averted, by a timely attention on their parts to the first symptoms." \* \* "I am decidedly of opinion that the extension and continuance of the epidemic have been very much mitigated and checked by the measures in factories, and amongst the population generally, for arresting the first symptoms."

During the late epidemic of cholera, one large house of refuge was immediately opened by the Glasgow city parish, and another by the barony parish. The total number of inmates received into both was 807. These people were chiefly taken from infected houses; and a large proportion of them would doubtless have suffered, had they been left in their homes. It appears, from statistical evidence, that between 30 and 40 per cent. of the deaths from cholera cases in towns take place in houses where more than one person has already died, while entire families have often been swept away. But among the 807 persons removed to the houses of refuge in Glasgow, there were 25 cases of cholera, and only 8 deaths; this small comparative mortality arising, no doubt, from the early treatment brought to bear on the cases. *The house of refuge I consider one of the most important of the preventive measures.*

In conclusion, I would observe that while it is admitted that the present epidemic cholera has shown a tendency to be more severe than that of 1832, the actual comparative mortality in Glasgow has been very much less than on the preceding visitation. In 1832 the population was 203,000; it is now 355,800. The houses which have been built to accommodate this greatly increased population have by no means been adequate; so that overcrowding prevails to a greater extent than it did formerly.

Dr. Strang, the City Chamberlain, has shown that the mortality from cholera in 1832 was 1.4 per cent. of the population, while in 1848-1849 it was 1.06 per cent.; showing a comparative mortality less by 1849 than that of the cholera of 1832.

A consideration of the preceding pages appears to lead to the conclusion that a considerable portion of this great saving of life is, under Providence, to be attributed to the preventive measures of the General Board of Health.

### III.—REPORT ON THE MEASURES FOR THE RELIEF OF CHOLERA IN MANCHESTER.

THE township of Manchester is divided into five districts for parochial purposes—Market-street, St. George's, Deansgate, London-road, and Ancoats—and over each of these is placed one medical officer to attend the parish poor. The population in each of these districts, in 1841, was as follows:—

	Population.
The Market-street district	. 27,832
St. George's	. 31,576
Deansgate	. 33,093
London-road	. 28,912
Ancoats	. 42,254
Total . . .	<u>163,667</u>

Mr. Noble, the medical superintendent of St. George's district, has addressed to me a published report on the results of the preventive measures adopted in the township, from which I borrow the following sketch of the progress of the epidemic:—

“The first fatal and unequivocal case of Asiatic cholera during the late visitation took place in the Market-street district, in the second week of June; sporadic instances were rumoured for the next week or two, but no other fatal case occurred till the last week of the month, when four cases of death from the disease were registered, three of which were in the Canal-street Hospital, and had been removed from the St. George's district. But slow progress, however, was made by the disease until the latter end of August, when it became decidedly epidemic, and continued to prevail with some severity until the early part of October, at which time a rapid decline took place, exactly coincident with the medical arrangements for combating the malady, organized by yourself during your visit of inspection at the end of September.

“The following table, showing the number of deaths registered in each week for the several districts and for the hospital, will exhibit the course of the epidemic to some extent, commencing with the week ending June 16, and concluding with that ending November 3rd:—

CHOLERA DEATHS registered in the Township of MANCHESTER.

1849. Week ending.	Market street.	St. George's	Deans- gate.	London road.	Ancoats.	Hospital	Total.
June 16	1	..	..	..	..	..	1
„ 23	..	..	..	..	..	..	..
„ 30	..	..	..	..	1	3	4
July 7	..	1	..	..	1	..	2
„ 14	..	..	..	..	..	..	..
„ 21	..	..	..	..	..	1	1
„ 28	1	..	..	1	3	3	8
Aug. 4	2	1	..	..	1	1	5
„ 11	..	1	..	1	2	3	7
„ 18	1	2	1	6	1	3	14
„ 25	1	3	3	2	4	6	19
Sept. 1	3	4	13	4	9	8	41
„ 8	8	8	42	21	18	14	111
„ 15	11	17	32	31	44	32	167
„ 22	9	11	30	35	39	20	144
„ 29	12	24	12	24	42	30	144
Oct. 6	8	9	14	11	42	21	105
„ 13	..	3	11	9	5	3	31
„ 20	1	3	4	3	3	2	16
„ 27	..	..	1	1	3	2	7
Nov. 3	..	1	..	..	..	..	1
Totals.	58	88	163	149	218	152	828

The subjoined reports will illustrate the condition of those parts of the township where cholera localized itself.

MARKET-STREET DISTRICT.—The medical officer, Mr. Golland, states:—

“The Market-street district embraces the centre of the town, comprising the oldest part of it. On looking over the list of cases of cholera

which have occurred, I find that they have been very equally distributed over the district; not that every street has presented cases, but cases have appeared in different localities over almost every part of the district. This may be perhaps accounted for by the fact of the district being enclosed by all the other districts, and by the fact that all the second and third rate streets are very much on an equality as to sanitary conditions, all being paved and sewered, and all equally crowded.

“Half the cases of cholera have occurred in courts and cellars, as was to be expected, for, in the former, there are almost always open privies, &c., the effluvia from which cannot readily find an exit or become diluted; and the latter (the cellars) are generally supplied with an open gully-hole communicating with the drain immediately on the threshold. The exhalations from these are often most offensive, and accumulate in the cellar, for the ventilation of which there is generally no provision whatever.

“Most of the houses in which cholera appeared were built on the back-to-back plan, or had been made so for the convenience of subletting the rooms as separate dwellings. This mode of closing up the communication between the back and front of a house is very general and very injurious. Where there was a back entrance it was very confined, and served only to admit the vapours from the privies, which are placed immediately contiguous. For any purposes of healthful ventilation it was worse than useless. Indeed, the privies seem to me the one great nuisance in a large and closely built district in the centre of a town like this. The main streets seem free and open, but the back streets and courts, where the poor chiefly reside, are immediately in contact with the back premises of the better class of houses and shops, where the privies and middens are usually placed. It frequently occurs that a court is composed of as many backs of middens as of cottages, the one facing the other. A very low standard of general health amongst the poor is the result, rendering them very prone to fever, and fit subjects for the epidemic of the day, whatever that may be. So long as large quantities of manure are thus left at their very doors as poison generators I fear that no material improvement in their condition can be expected.

“The district is almost wholly supplied with water from the pipes of the Waterworks Company. The water is not, and has not for some time, been of good quality, being hard, impure, and often filled with animalcula. The supply is intermittent, being turned on for an hour each day; one tap at the bottom of a court or at the corner of a street generally serves for several cottages. The water is collected in all kinds of vessels, and left to stand in their close hot rooms until required for use. Of course an unreasonably small quantity is thus obtained, and cleanliness, both of person and dwelling, is at a great discount. There is a lamentable want of ventilation in the houses where cholera has appeared. It is a thing of which the poor themselves seem to have very little idea, and their dwellings are generally so constructed as to render it difficult of accomplishment, even when the necessity for it is pointed out to them. The cellars, particularly, are often highly offensive on this account, being very low over head, and having no outlet but the door. The drainage of the district has been much improved of late years; indeed almost every street is sewered and paved.

There is a deficiency of house-drains, however, and in consequence it is quite usual to see women emptying the chamber utensils, &c. in the gully-hole in the street, and, if that is not opposite the door, into the gutter. When there is a house-drain it is frequently of little use, as the houses are often sublet in rooms, so that only one family may have access to the sink where the drain happens to be placed. Most of the inhabited cellars have drains, but they are generally so placed and constructed as to be a positive nuisance and cause of disease instead of an advantage. The district has a river frontage on one side only, formed by the Irk and the Irwell, both of which, but *particularly the former*, are filthy and offensive in the extreme, partly from receiving the contents of the drains, and partly from the refuse of various manufactories on their banks. It is remarkable that no cases of cholera occurred immediately contiguous to the banks of these streams, though I had expected that many cases would be found there; for, during the cholera epidemic of 1832, the first group of cases in the town occurred in Allen's-court, Long Millgate, situated on the left bank of the Irk, immediately opposite to where the sewer from the workhouse opens into it, and the stench from which is often very great.

"Before concluding these disjointed remarks I must again repeat that, so far as regards my district, the grand evil seems to be the accumulation of such vast numbers of privies and cesspools in the heart of the densely peopled town, rendering it one huge Augean stable, the cleansing of which seems a truly Herculean task."

The following is Mr. Noble's Report on the state of ST. GEORGE'S DISTRICT:—

"The great bulk of cholera cases that have arisen in my district have been in localities distinguished as the *habitat* of fever.

"The sanitary condition of these is, in many respects, very bad, and in some not so much so as in corresponding districts of other large towns.

"To particularize:—The supply of water is scanty and intermittent, being obtained from pipes; the flow, I am told, is for little more than an hour each day, and there are at least 20 families for each pipe. The quality is so bad that animalcules are frequently visible to the naked eye. The custom with those who can purchase a filter is nearly always to use one.

"The open streets very generally are sewered and drained; the surface drainage is also good, but in courts there is a great defect, water and refuse frequently accumulating, owing to the paving and flagging being out of order, and to the gully-grates being in bad repair. These latter are not trapped, and they frequently emit sensibly obnoxious effluvia. All but the worst-conditioned dwellings have drains leading to the sewers, but they are frequently out of repair.

"In the particular haunts of epidemic disease the privies correspond in their character with the worst accounts that recent sanitary reports have afforded.

"The sewers open into the river Irk, which is little more than a broad stream. The emanations are offensive enough at times, and the water is substantially an open drain. It borders the north of my district. Cholera did not prevail to any great extent on the bank, a circumstance probably attributable to the comparatively rural character of the locality.

'As a general rule cholera could not be connected with specific nuisances, manure heaps or pigsties not existing to any extent. I only know of one tolerably extensive slaughter-house in Lees-street, and contiguous thereunto many cholera cases occurred.

"The lodging-houses are numerous and very crowded, and such places furnished the majority of cases.

"In the epidemic tracts cellars abound. The houses in such neighbourhoods are very commonly back-to-back."

DEANSGATE DISTRICT.—Mr. Stott, the medical officer of this district, gives the following account of its sanitary state:—

"1st. The water supply is usually obtained from pipes. In some few localities from wells. The former is supplied by the Waterworks Company, and is of good quality, the latter is generally reported as inferior. Where the pipes have been recently put down it is complained of. The supply in both instances is intermittent; from the waterworks every morning early, and from private pumps from 7 to 9 A.M.

"The only parts of this district where the supply of pipe-water is wanting are concomitant with the parts first attacked by cholera, where it set in with the greatest violence, and, indeed, where every evil in a sanitary point of view is met with.

"2nd. The state of drainage is generally good, as it is, I believe, throughout the whole city. The affected districts are sewered, and the gully-grates are in good order, with few exceptions. The privies and cesspools are well and properly attended to, and, except in a few solitary instances, of proper proportions.

"3rd. The relation of the attacks of cholera to river banks, &c., may be well observed in this district, surrounding one part of which, the southern or Knott Mill extremity, where the disease first set in and spread, is a stream constantly impregnated with offensive effluvia from dye-works, &c., in the neighbourhood.

"4th. It appears that cholera was connected with specific nuisances in a few instances, viz., in Bridgewater-street (five cases in one cellar), near to which there is a scavenging depôt; in Alport Town, where there are manure-heaps, and where a number of pigs are kept; in Back Queen-street and in Wood-street and Spinning-field, where the slaughter-houses are numerous.

"5th. The state of the lodging houses has been much improved of late by the authorities; they are usually in a very clean state, and overcrowding is but seldom met with. The same remark will apply to private dwellings.

"6th. There are not many instances of back-to-back houses that are not tolerably ventilated. Many of the houses are old and large, and consequently each is occupied by several families.

"7th. The part to the west of Deansgate is generally open, well ventilated, and occupied by good houses and streets; there are some small portions, however, of this district highly objectionable in all these respects.

"The eastern part is much more densely inhabited, and consequently less ventilated; and in this section of the district has cholera prevailed in the proportion, I should say, of three to one at the least.

"Where back-to-back houses do occur the intermediate passage is generally foul, badly paved, and often not drained, consequently the

surface-water distils through the cellar walls, causing them to be damp, &c. I believe the most grievous complaint of the cellar inhabitants is want of privies, water, and ash-pits."

The slaughter-houses referred to in Mr. Stott's report were a cause of great nuisance and complaint while the cholera prevailed in the town, and gave rise to considerable alarm in the neighbourhood where they are situated. A statement of the circumstances was made to me, both verbally and in writing, and a formal complaint, signed by the 29 chief householders living within 150 yards of the nuisance, was laid before me. It is stated that all the small tenants would also have signed it had they been called on. This latter document was accompanied by a description of the nuisances by Dr. Stephens, F.R.C.S., and, as it gives a good account of the class of annoyances usually experienced from slaughter-houses, and of the effects they have on the public health, I give the following extracts from it:—

"There are five or six butchers who slaughter in the houses in Rowe's-court in Bridge-street; one or two of them slaughter very extensively for butchers in general, that is, for those who do not kill for themselves. At a low calculation it is considered that about 200 head of cattle per week are killed in this confined spot. Places more unsuitable for slaughter-houses could not have been selected. These back courts cannot be approached except through narrow winding passages, hence there is great difficulty in driving the cattle through them, which leads to disgraceful cruelty in forcing by beating and almost worrying them with dogs. In the confusion the poor affrighted creatures run in wherever a door remains loose. The shouting and cursing of the drivers, the noise of heavy blows on the animals, and the barking of dogs are very vexatious and painful. We have no respite even in the night time. Slaughtering generally commences at four o'clock in the morning, and the neighbours hear every beast knocked down, occasionally accompanied with dreadful groans.

"The worst circumstance about these slaughter-houses is the accumulation of an enormous quantity of animal and vegetable matter in large holes, where they lie festering, fermenting, and putrefying together, and from which there is a constant emanation of offensive vapour poisoning the atmosphere, and highly dangerous to those houses which form the enclosure of these places. The climax of all that is abominable takes place when they are emptying these holes. The operation commences about one o'clock in the morning; the stuff is wheeled into Bridge-street, where it is thrown down, to be conveyed away by carts before 8 A.M. During the whole of this time the horrible stench is so great that it produces in every person who is subjected to it a sickening sensation. I have seen persons heaving and vomiting. As to the houses, it is utterly impossible to keep the stench out by closed windows; every room is pervaded by it. I am myself obliged to put a handkerchief over my nose and mouth scented with spirits of camphor or creosote. Most of the neighbours awake with headache, nausea, and loss of appetite. It is one of the most disgusting sights to see the loading of the carts; scores of yards of green, blue, or yellow putrid entrails hang in festoons over the sides and wheels. I have also seen large masses of coagulated blood, and sometimes the whole stuff of a brownish red colour from this addition.

"The fluid contents of the holes are drained away into sewers, which, I understand, are very imperfect. At the time of emptying the holes the poisonous vapours waft up the main sewers into the domestic sewers, especially the kitchens and cellars, and from this cause I have been obliged to remove the slop-stone from my kitchen, and close up the sink entirely. The accumulation of animal substances attracts large numbers of rats, and the houses are infested with prodigious quantities of common flies and flesh-flies.

"I can state, from extensive experience in practice in this locality, as well as in other parts of the town, that the nuisance is decidedly injurious, and even dangerous, to the health of the inhabitants, and predisposes them to more disease than in other localities where no such nuisances exist. I think that some diseases are excited or produced by it, such as fevers, dyspepsia, &c. The prevailing diseases at all times are low gastric fevers, with a strong tendency to run into the typhoid state. Several patients have declared to me their conviction that the nuisance was the exciting cause of their illness. The majority of these cases recover, but their progress is tedious and lingering. I have seen some cases in Bridge-street, and in the small houses behind the slaughter-houses, of decided malignant typhus. During the epidemic there has been a great number of attacks of diarrhoea and cholera in the neighbouring streets. On reference to the registrar I find there have been eight deaths from cholera alone in these localities."

The next Report is from Mr. McKeand, Medical Officer of the LONDON-ROAD DISTRICT.

"The London-road district, being the name given to that portion of the town under my direction, contains a population of about 30,000. It is bounded upon one side throughout its whole course (say the distance of a mile and a half) by the river Medlock, a black filthy ditch, into which the inhabitants upon its borders or the various manufactories in its course, consisting of dye and chemical works, pour all their superabundant filth. Innumerable privies, connected with the back of long terrace ranges of private dwellings, empty themselves into the same source; in fact, it is the eliminating channel for all who can reach its banks to pour off every nuisance, liquid or solid. The opposing side of the district is bounded by the Rochdale Canal, nearly throughout the same extent.

"The Ashton and Stockport Canal runs for the most part through its centre, so that you will perceive we are well supplied with water of a stagnant character. I may mention that the Medlock is never emptied of its filth, except in times of floods, or very partially so; the stream in many places, in dry weather, is not more than 2 feet in depth at its centre.

"The district is supplied in general by stone pipe water, which is only allowed to run on during certain hours of the day; it is very good on the whole, but all who *can afford*, filter it. I am supplied through the same source at my own dwelling, of course, always filtered for table use. There are also many pumps spread through the district, which yield good water; it is not so much the quality of which I complain, but the quantity; the poor have often long distances to carry it, and there is *never* sufficient for clearing the drainage accumulations.

"Cholera principally localized itself in the centre of my district; a large square knot of old buildings, which is bounded by the Medlock

upon one side, and by Granby-row on the other, with its burial-ground, overflowing to repletion, and constantly exhaling the most fetid smells. It ought long since to have been closed. I may remark, it is one of the Catholic chapels where the Irish are principally interred, and has long been a bane to the neighbourhood; the other two sides are bounded on the one hand by the large public thoroughfare, the London-road, and the other by Shepley-street. I cannot state with correctness, but, at a fair guess, would say 2000 human beings reside in the dwellings of the above square. The houses are all old, principally having cellars to them, full of courts without yards, and all built back to back, without any passage, and ventilation of course deficient; the neighbourhood has its due share of manure heaps, piggeries, bone-dealers, cinder accumulations, &c. &c. The drainage is very bad, as it always is about the old dwellings; the privies are crowded with too many applicants, one sufficing in general a bundle of houses; the poor in these places, I find, make much use of chamber-pots, in preference, and empty them on the cinder heaps. The town of late has done much to remedy this evil, and in one part has built several privies, as additional accommodation, but they have been placed before the dwellings in any little square which has been previously left open, and although, on the one hand, relieving one nuisance, add another of nearly a worse kind; the paving and street cleansing of the whole district is good. I may fairly state, cholera commenced, and remained to the last, in the above neighbourhood; that the cases, both of cholera and choleraic diarrhoea were in cellars, badly drained and ill ventilated houses, and especially those of an over crowded nature. Most of the cases were of a fatal character. In other parts of the district where cholera has occurred, it has principally been traceable to a not sufficient attention to cleanliness, although I have seen the disease occasionally when it could not be attributed to such cause.

"I have no doubt, if the district officers were duly empowered, they would be the means of saving many lives through their system of prevention, and until the business for nuisance removal of all kinds is laid on their shoulders, there will be no effectual check to that rapid and continuous accumulation of offending sources, always taking place in the large communities of towns like this."

ANCOATS DISTRICT.—The following is *Mr. McKie's* Report.

"The Ancoats district is intersected by two canals, the Ashton and Rochdale, and a small stream called Shooter's Brook. The supply of water is intermittent, and obtained from pipes and pumps, principally from the former, and is very inadequate, there being, in most cases, one tap for a great many houses, and only available *one hour* out of the twenty-four. Previous to use, it ought to be filtered, but few of the poor have the means. The district is generally well paved and drained. Very few houses exist on the bank of the river Medlock, and I am not aware of a single case of cholera having occurred there; the water of the river as well as of Shooter's Brook is impure, owing to manufactories, but not offensive. I believe, in the London-road district it is both.

"Cholera cases have in general occurred in groups, and the sanitary conditions which appeared to be most connected with the affected localities were the following:—overcrowding, want of ventilation, back-

to-back houses, cellars, drains into sewers, not trapped, and to these may be added, in some of the groups, want of paving, sewerage, and draining."

These reports on the sanitary condition of the districts of Manchester township, where cholera became localized, appear to me to be particularly valuable, and to form a good basis on which to rear such a system of structural improvement as is required for so great a population. I feel satisfied from experience in other places, that the epidemic has in this instance also acted as a true indicator of those defects which lower the physical and moral standard of the people; and it is to be hoped that the warning voice which is still audible will not be allowed to pass unheeded. That the deaths were not more numerous I feel persuaded is, in some measure, owing to the great extent to which lime-washing and house cleansing were carried by the local authorities; but it is evident from the general tenor of the reports, that many other things require to be done before the public health can be considered safe.

I began the inquiries necessary before the introduction of the preventive measures on the 24th of September, and inspected most of the localities then suffering from the disease. The arrangements were found not to be adequate for the emergency, and a new organization had to be put in force.

The five districts of the township were retained, and the medical officer of each was appointed to act as superintendent for his district, and to take the entire charge and responsibility of the arrangements.

To each of the districts a sufficient number of qualified medical officers were appointed, for the treatment of all promonitory cases and cases of cholera applying to them within the limits of their district. They attended to all cholera cases discovered in their district by the medical visitors, and also all cases that had been attended through the night by the medical officers stationed at the night dispensaries.

A daily report of cholera cases in each district, with the residences of each case, and a report of the number of promonitory cases attended by the medical officers, with the streets and lanes affected, was made up each day, for the use of the medical superintendents. The promonitory cases were classed under two heads, to wit, "Simple Diarrhoea," and "Cases approaching to Cholera."

In conformity with the regulations of the General Board of Health, the medical officer was instructed, whenever a case of cholera occurred under such circumstances as to render it probable that the disease might spread from overcrowding, or other similar causes, to remove such of the inmates of the affected house, to the House of Refuge, as he might consider necessary for safety.

It was a special instruction, that removal of patients to hospital when necessary, should be determined on as early in the disease as possible, and that no case approaching to collapse should on any account be removed.

The medical officers reported daily to the medical superintendent of their district all houses where lime-washing or cleansing was required, and all nuisances which ought to be abated.

The medical visitors were allocated in those districts of the town



where the cholera had shown itself. They were instructed to visit each house in the districts once a day at least, and in cases of sudden attacks in confined localities at such shorter intervals as might be necessary. They were to inform the people specially as to the object of their visits on going round the first time; and, if possible, to see every person in the house, and converse with them, in order that all might know the object of the visitation, so as to render every information and assistance to the visitors on their subsequent visits. The visitors were requested to impress on the people the necessity of attending to the earliest symptoms of derangement of the bowels, and to direct them specially to apply to the nearest dispensary, or to the district medical officers, if taken ill during the intervals between their visits. They also carried with them suitable medicines to administer to all persons suffering from cholera, or from premonitory symptoms, and exhibited them on the spot where required; and they gave information or caution to the people in regard to cleanliness of persons or houses; the danger of over-crowding; the necessity for ventilation; the evil of drinking habits; and other similar matters.

All cases of cholera, discovered during the visitation, were treated by the visitors, until they could be transferred to the medical officers of the district where they were found.

Cases of diarrhoea or rice-water purging were attended by the visitors till the parties recovered; but if any case passed into cholera while under treatment, it was transferred to the medical officers of the district.

The visitors reported to their medical superintendent all instances in which lime-washing or cleansing, either external or internal, was required, and all nuisances which needed removal. They also made daily returns to the superintendents of all cases of diarrhoea, cases approaching to cholera, and cholera cases discovered on the visitation; and met with the superintendents every day, to give in their reports, and to consult on the concerns in their districts.

Suitable medicines for the treatment of simple diarrhoea were provided at each of the five day dispensaries, and a dose or two dispensed to each applicant labouring under disease; but the case was sent to the medical officer of the district for future treatment. All persons applying for medical aid for patients confined at home, were also carefully referred to the medical officers of the district.

Five night dispensaries were open from 10 o'clock, P.M., till half-past 7 o'clock, A.M., of the following morning. All applications for medical aid for persons seized with illness at home were immediately attended to by the medical officer on duty. Cases of cholera, or premonitory cases, which had been visited during the night, were transferred to the district medical officers not earlier than half-past 7 o'clock of the following morning. One medical officer from the staff of each district took the night duty at the district night dispensary by rotation.

The superintendents met with the visitors once a day, and received their reports. They classified and made up the returns, and sent a copy each day to the General Board of Health. They received all reports from the visitors and district surgeons, as to lime-washing and cleansing required, and forwarded them daily to the proper authorities.

The superintendents were instructed to ascertain the precise localities

most affected by cholera, by means of the returns received from the district medical officers and visitors, and from the registrar's books, and from any other sources of information, and to make out lists of affected localities on which to locate their visitors for their daily work.

They took a general charge of the sanitary and preventive measures in the district, and as the responsibility of the proper medical relief of the sick rested with them, they had to make frequent visits to the affected portions of their districts, and to report to the Guardians whenever additional medical aid, or a larger number of medical visitors were required. They used their influence, when necessary, in aiding the removal of families to the House of Refuge, or patients to the hospital. And the superintendent in whose district the House of Refuge was situated, was instructed to inspect the inmates twice a-day, in order that all premonitory cases occurring among them might be brought immediately under treatment. They also visited the hospital to examine into its efficiency.

Daily minutes of the proceedings of the meetings were made, and laid before the Sanitary Committee of the Board of Guardians, along with daily schedules showing the state of the disease in the Union.

A suitable schedule was provided for each officer and institution, so that the working of the entire preventive machinery could be at any time ascertained with great ease.

The following is a summary of the organization adopted:—

Five districts, with a medical superintendent to each.

Thirteen Medical officers to attend cholera cases.

Nine Medical visitors for house-to-house visitation.

Five day dispensaries, with suitable attendance.

Five night dispensaries, with a qualified medical attendant to each.

One house of refuge.

One cholera hospital, with proper medical attendance.

A suitable staff of nurses.

A hand-bill warning the people, and describing the arrangements made for their protection, was printed for each district, and was distributed by the police to every house in the affected localities. A code of instructions was also printed for the medical officers and visitors.

It took several days to bring the machinery into full operation; and the first return was made on the 2nd October. The visitors had only been a few hours in the districts, and yet they reported the discovery of 178 premonitory cases, 20 of which were in the act of passing into developed cholera.

From this period the preventive measures were carried out with great zeal and ability, by the superintendents, medical officers, and visitors, and let us mark the result. Table VI. gives the approximate number of cholera cases occurring in the parochial districts, from 1st September until the introduction of the preventive measures on the 2nd October; and from that date it shows the entire number of cases of all denominations brought under treatment by the dispensaries, medical officers, and visitors. It is impossible not to be struck with the enormous amount of neglected premonitory cases, many of them of an extremely dangerous character, which were discovered during the house-



to-house visitation, and with the very small proportion of them which finally passed into cholera. The preventive measures were in operation for about a month, and the aggregate of cases treated within that period was as follows:—

Applicants at Dispensaries.	Diarrhœa Cases Discovered by Visitors.	Cases approaching to Cholera Discovered by Visitors.	Premonitory Cases passed into Cholera.	Cholera Cases.	Deaths.	Recoveries.
936	2,612	261	27	169	75	84

It will thus be seen that out of 3,809 premonitory cases, no fewer than 261 of which were caught in their passage into developed cholera, only 27 actually did so, while above half of this number occurred within the three first days from the commencement of the preventive measures, and before they were in full operation. The effect of these successful means was, that a check was immediately put to the development of cholera. Plate 11 (see Report, page 100) shows this result in a striking manner for the whole township, but not so much so as the districts do when taken individually.

I have elsewhere stated that cholera attacks *successive groups of localities*, so that while it is being kept down in one, a fresh outburst in another vitiates the statistics. It is impossible to get rid of this element of error, by any other means than by circumscribing the *area* of the statistics as far as possible. Table VII. gives the number of premonitory cases and cases of cholera for each of the five districts in the township, and I have transferred the data to Plates 12 and 13 (see Report, page 100), which exhibit the results at a glance. It will be perceived that within a few days after the measures were in full operation, the cases were transferred from the denomination of *cholera* to that of *premonitory*, and the developed form almost immediately disappears, while the earlier stages continue till the epidemic influence declines. It appears to me that these diagrams exhibit as strong proofs of the success of the preventive measures adopted in Manchester, as the nature of the case admits of.

The following extracts from Mr. Noble's report, already mentioned, will show the opinion entertained on this subject by the gentlemen who had the actual working of the methods adopted for arresting the epidemic:—

"You will perceive, from the whole of the foregoing figures, that prior to your operations in this locality, no indications of decline were observable in the epidemic. Your arrival in Manchester took place on Monday the 24th September; and in four days (on Friday the 28th) the preventive organization was partially in action. By Monday, October 1st, all the medical officers and visitors were at work; not, however, till Wednesday the 3rd was the machinery in complete operation,—at which period superintendents, medical officers, visitors, and dispensaries, each fulfilled their respective parts as prescribed by the instructions issued under your sanction; and from this latter date the returns daily were punctually made. The following abstract from the general returns of each day, displays, in a very interesting point of view, the impression that your measures made upon the epidemic. Each

column exhibits the daily results as regards the discovery of new cases, and the issue of instances returned as cholera."\*

"The significance of the preceding table you will readily appreciate,—cholera cases diminished at once and rapidly. If, as was thought by some persons, the result was attributable to diminished temperature, or to the natural decline of the epidemic, there should have been a simultaneous and proportionate diminution in the amount of diarrhœa; this, however, you will see was not so;—incipient cholera, or diarrhœa, raged for nearly three weeks after the measures were in operation, but confirmed cases had become of rare occurrence.

"On the general working of the preventive agency, I cannot better reply to your several inquiries than by supplying you with a copy of the following note to myself from Mr. Lythgoe, a most intelligent surgeon, residing in the district of which I was superintendent. This gentleman was one of our most active and energetic medical officers, and his recorded experience corresponds substantially with the conclusions at which I have myself arrived, alike from my own observations and from conference with individuals of the medical staff generally.

"First—I believe the general working of the preventive measures to have been admirable, and the sole cause to which the rapid decline of the epidemic can be ascribed. I think overdue weight has been given to atmospheric influence in checking the disease, as I have observed, on several occasions, that, after 24 hours of a dry, bracing air, cases of relaxation of the bowels have increased both in numbers and intensity; this circumstance, as far as my own observation goes, has not been the result of accident; but has occurred on several occasions after atmospheric changes from a warm, moist, relaxing atmosphere to one of the opposite extreme. I have no hesitation, therefore, in awarding to the preventive measures adopted the full credit of having produced the sudden check and the succeeding decline in the epidemic.

"Second—The effect of house-to-house visitation is best shown by the almost total cessation of the calls upon the district medical officers for the locality in which the house-to-house visitor is occupied; he appearing to banish the disease as he progresses. House-to-house visitation in this district has been most salutary and efficient in checking the premonitory symptoms which, at the commencement of the outbreak, the lower orders of Irish were disposed to neglect.

"In answer to the third question, I can safely say that, as medical officer, I have had the most unbounded confidence and reliance shown me by the patients and their friends, which may have tended in some degree to their security. My suggestions as to prophylactic measures in general, and the treatment of cholera, whenever practicable, have always been strictly and energetically carried out; in short, even among the most indigent, I have met with a ready acquiescence and obedience to any suggestions offered. I have much pleasure in stating, that, with very few exceptions, the most grateful feeling has been evinced by the necessitous poor for the services rendered; and I have no doubt the measures adopted by Dr. Sutherland for their relief are considered by them as the greatest boon which could have been offered.

"THOS. LYTHGOE,

"District Medical Officer, St. George's.

"D. Noble, Esq., Medical Superintendent."

A meteorological table, subsequently published by Mr. Noble, showed that the state of the weather had no connexion with the change in the character of the epidemic. The statistics and diagrams, indeed, prove that the epidemic declined *as a unity* during the whole month of October, but they at the same time prove, that the preventive measures kept it from assuming the true developed character, com-

\* These data are given at length in Table VI.

monly known as cholera, for three weeks of the period. Epidemic cases still occurred, but made their appearance almost solely in the *pre-monitory* part of the schedule. I subjoin the individual opinions of other medical superintendents.

DEANS GATE DISTRICT.—*Mr. Stott*, Medical Superintendent, says,—“ I beg leave to assure you of my entire approval of the preventive measures which have been originated by the General Board of Health, and which have been recently so successfully carried out in this city. The effect of the house-to-house visitation in cholera appears to me to be the only decided means of staying the progress of the disease and of saving life. The result of this mode of action has been well shown in the New Bailey Prison here, where we had 73 cases ‘ approaching to cholera,’ of which 23 became decided cases. Out of these only five deaths occurred, and this satisfactory result may be entirely attributed, as I believe, to the daily searching inspections instituted.

“ I am perfectly satisfied that the house-to-house visitation has been very efficiently carried out in this district, and I am informed that the visitors, generally speaking, were most cordially received and welcomed by the inhabitants—that a degree of confidence, as well as a feeling of safety was thereby engendered, and that much good in the removal of nuisances has been accomplished. Cholera, I am happy to say, has almost entirely passed away from us, and though in the early period of its course it was violent and destructive in the extreme, yet, thanks to the more recent measures, and as compared with other districts, I think we have much reason to rejoice that we have been so leniently dealt with.”

LONDON ROAD DISTRICT.—*Mr. McKeand*, Medical Superintendent, writes,—“ I have much pleasure, as one of the district medical officers of the Manchester Union, in tendering my humble testimony to the admirable manner in which the system of checking the cholera epidemic has so truly and faithfully answered.

“ I consider, in the first place, that the manner of pursuing the cholera, as suggested by house-to-house visitation, has assisted most effectually in arresting its progress. To those well acquainted with the habits of the lower orders in large cities, we discover with sorrow to what extent disease often commits its ravages without any medical aid being applied for, and in cholera more particularly, where the fatal effects so soon follow its seizure. I view the system of house-to-house visitation as indispensable; without it many, many lives must have been sacrificed. Its effect has been to give confidence to the poor and timid, and waive off many fears, the existence of which we know to have much baneful influence. From the very day of the system being established, as will be seen by the returns, the disease gradually gave way, each day bringing in succession a most extraordinary and rapid decrease.”

MARKET-STREET DISTRICT.—*Mr. Golland*, Medical Superintendent, writes as follows:—“ In answer to your inquiries respecting the medical arrangements for the treatment of cholera, I should say, that at the time of your first visit to Manchester there was great alarm amongst the people, and a general feeling of irritation and distrust in the minds of the poorer classes at the delay and difficulty experienced in pro-

curing medical aid, which rendered them often apathetic and careless in applying for assistance. As soon as it became known, that in accordance with your arrangements, prompt and efficient assistance could at all times be immediately secured, the alarm almost entirely subsided. The beneficial effect of the preventive measures adopted became very soon evident in the decrease of deaths and the rapid decline of the epidemic. The house-to-house visitation which you organized seemed in the highest degree beneficial, first by inspiring confidence, and secondly by the immediate and effectual treatment which it afforded to all premonitory cases. It had another beneficial effect in discovering and removing, as far as practicable, of many nuisances and causes of disease which would have been otherwise overlooked. From my observation of its working here, I have come to regard house-to-house visitation as the most important of the preventive measures in epidemic cholera. As far as I could judge it was very well carried out here. I do not think that the beneficial effects of wise and judicious medical inspection could be better illustrated anywhere than in the case of the Manchester epidemic.”

#### IV.—REPORT ON THE MEASURES ADOPTED FOR THE RELIEF OF CHOLERA IN THE BOROUGH OF KINGSTON-UPON-HULL.

THE Borough of Kingston-upon-Hull is under the jurisdiction of two Boards of Guardians, one representing the united parishes of the Holy Trinity and St. Mary's, and the other being the Board of Sculcoates Union. I have elsewhere given a minute account of the circumstances attending the first imported cases of cholera into the town from Hamburg. This event took place towards the latter end of September, 1848, and although there appeared to be no immediate danger of an outbreak of the disease at that time, I deemed it my duty to call the attention of the guardians to the necessity of making arrangements for the protection of the public health. With the exception of one or two sporadic cases of cholera, the disease showed no tendency to locate itself until the month of July, 1849, at which period I was directed by the General Board of Health to make an inspection of the borough for the purpose of ascertaining the nature of the attack, the preventive measures which had been adopted, and the amount of medical relief afforded.

There could be no doubt that the disease had then become localized in the district called the Mytons; but I am sorry to say that, with the exception of a laborious and tedious process for abating a few nuisances, no steps of a really preventive nature had been taken. No houses had been lime-washed, no houses of refuge provided, the dispensary relief was utterly insufficient, and no house-to-house visitation had been adopted. These remarks apply especially to the defective arrangements in the united parishes of Holy Trinity and St. Mary's, for the cholera had not as yet become prevalent in the Sculcoates Union. In the urban districts of the latter, however, the sanitary preparations were most inefficient. Immense accumulations of manure existed in the midst of densely peopled neighbourhoods, and the cleansing in many of

the localities most likely to be visited by the disease had been grievously neglected.

I drew the attention of the authorities to the measures which required to be adopted, and a distinct plan of procedure was verbally agreed to by the Guardians of the Hull parishes in order to meet the probable advance of the disease; and after having received assurances of its being carried out, I left the town.

From this time the epidemic progressed, at first slowly, but afterwards with enormous speed; the mortality from cholera, and cases reported as diarrhoea, rising as high as from 80 to about 100 a day. On account of the very urgent representations made by residents in the town, setting forth the utter neglect with which the regulations of the General Board of Health had been treated, I was again directed to visit Hull, which I accordingly did on the 13th September, and found the aspect of things even worse than had been represented. The authorities of Sculcoates Union must, however, be excepted from these remarks; for although their preventive measures were incomplete, they were in a state of considerable forwardness, and as soon as the necessary steps were pointed out they were immediately taken.

It was stated to me that the acting committees of the Boards of Guardians had met with great difficulties in the removal of the most dangerous nuisances, from indisposition on the part of the magistrates to convict the offenders.

The Guardians of the united parishes of Holy Trinity and St. Mary's I found had taken no one step to carry out the arrangements to which they had agreed two months before. They had still no house of refuge; they had closed all the dispensaries; their medical attendance was insufficient; they had employed no house-to-house visitors; they had limewashed no houses; they had organized no cleansing staff; and, what was worse than all, they appeared to have arrived at the conclusion that cholera was a divine judgment utterly beyond human aid, and against which no means of saving life could be of any avail.

All the circumstances were immediately reported to the General Board of Health, as well as the imminent danger to which the public safety had been exposed by the conduct of the Hull Guardians. The Board in consequence issued special regulations, in compliance with which the town was divided into a convenient number of districts, and the following arrangements were adopted:—

	Holy Trinity and St. Mary's.	Sculcoates.
Districts . . . . .	3	9
Medical superintendents . .	1	1
Medical officers . . . . .	6	9
Medical visitors . . . . .	6	9
Day dispensaries . . . . .	4	6
Night dispensaries . . . . .	1	2
Houses of refuge . . . . .	1	1
Hospitals . . . . .	1	2

The Hull Guardians were directed also to provide an Inspector of Nuisances, and a cleansing staff of 12 men for the limewashing of the houses in affected localities. The additional medical aid required to carry out the regulations had to be obtained from Edinburgh, and a day or two passed over before the whole arrangements were completed. A partial visitation was however begun in Hull on the 17th, and in Sculcoates on the 20th of September, and in a few days the whole machinery was in full operation. The working of the various parts of the preventive machinery was laid down in a code of printed instructions, schedules were provided, and printed notices distributed through the town to inform the people.

Up to this period the disease had confined its ravages chiefly to the parishes of Hull, and as there was no sufficient medical aid appointed by the Guardians, no idea of the number of cases occurring in the town could be obtained. I fear that not a few died without medical advice of any kind, and that these "casualties" would have been more numerous had they not been prevented by the sympathy and devotedness of many members of the medical profession who attended the poor without reward. In estimating the amount of good done by the measures of prevention in this instance, we must be guided chiefly by the returns of the Registrars, as there were no antecedent statistics with which the subsequent course of the disease could be compared. Table V. gives the data for the whole borough from the 31st August to the 22nd October, 1849.

The total numbers attended in all stages of the epidemic by the parochial officers, under the special regulations, were as follow:—

Dispensary Cases.	Diarrhoea discovered by Visitors.	Cases approaching to Cholera discovered by Visitors.	Premonitory Cases passed into Cholera.	Cholera.	Deaths.	Recoveries.
878	4,665	351	17	344	135	186

NOTE.—The results of 23 cases of cholera are not given in the returns.

It will be seen that, out of 5894 premonitory cases, 351 of which were passing into cholera, all were arrested except 17. The Tables show the enormous preponderance which the premonitory cases hold over those of cholera wherever a complete system of visitation is enforced, while at the same time they prove how small a proportion of cases apply of their own accord for dispensary relief.

The great majority of the latter class of cases occurred in the Hull parishes; while in the Sculcoates Union only 193 persons applied at the six day dispensaries for relief during the whole period the preventive measures were in force. A comparison of the registrar's returns of deaths from diarrhoea and cholera with those of the parochial medical officers, prove that a great number of persons died from the disease who were not necessitous, and who consequently did not come under the operations of the parochial relief measures; and we have thus another proof that, while the very poorest were protected by the arrangements,

the better class of working people in the receipt of wages, and not coming under the denomination of *necessitous persons*, suffered.

The Registrar's returns give the following weekly deaths from diarrhoea and cholera, which may be contrasted with the number of premonitory cases brought under treatment within the same periods:—

—		Deaths.	Premonitory Cases.
Week ending	September 6 .	398	..
„	„ 13 .	507	..
„	„ 20 .	324	383
„	„ 27 .	171	1,950
„	October 4 .	111	1,611
„	„ 11 .	28	1,222
„	„ 18 .	10	514

The house-to-house visitation was in operation in the Hull parishes on the 17th September, and in both Hull and Sculcoates on the 20th; and from these dates the returns show a prodigious number of diarrhoea and incipient cholera cases brought immediately under treatment, and which before had been left to take their own course without any attention, while at the same time the reduction in the number of deaths registered is most remarkable. It is impossible to say how much of this result is specially due to the preventive measures; but I am of opinion that, in this instance, as in many others, the decline of the epidemic influence is to be looked for, not in the diminished number of deaths registered, so much as in the decline of the premonitory cases, and that the arrest of these in their course towards cholera was the main cause of the statistical results which took place.

The preventive measures in the Hull parishes were placed under the superintendence of Dr. Ayre, and those of Sculcoates under Dr. Henry Cooper. Both of these gentlemen have published reports on the preventive measures presented to the Boards of Guardians, the following extracts from which I beg to subjoin:—

Dr. Ayre says—“In proceeding to give this report, I need scarcely remind you that six district surgeons attended to the patients through the day, whilst six others were occupied in house-to-house visitings, and three more were stationed throughout the night at the public dispensary to visit all who might need their assistance. The disease prevailed during three months, being less in duration by two months than it was in 1832; but what it wanted in the length of its continuance it unhappily made up in its almost unsurpassable malignancy, and especially in the early, and still more in the middle period of its prevalence. In the following Table will be seen the number of patients, and the results of the treatment employed for them; and it is with no inconsiderable degree of just pride, and with yet greater thankfulness, that I bring them under your notice. Of the cases here given it is to be understood that those of cholera were in full collapse when they came under treatment, and those in the premonitory stage were entering into that state; whilst of the diarrhoea cases the patients were

in that threatening condition which almost constantly precedes and leads into the full disease:—

Cases of diarrhoea attended by the six house visitors .	1,430
„ „ by the six district surgeons . . . . .	608
„ „ at the dispensaries . . . . .	868
„ cholera in full collapse. . . . .	725*
„ impending collapse. . . . .	133
	<hr/>
	3,764
Deaths from diarrhoea . . . . .	6
„ collapse . . . . .	365
	<hr/>
	371
Recoveries. . . . .	<hr/>
	3,393”

George-street, Hull,  
October 26, 1849.

In a communication received from Dr. Ayre, dated October 7, proposing a reduction of the medical staff, he says—

“The whole system has worked admirably, and has been of the greatest service in abating the mortality by the early attention that was given to the diarrhoea cases, none of which having scarcely ever gone forward into the true disease.”

Dr. Cooper, addressing the Sculcoates Guardians, reports as follows:—

“It will be remembered that when the system of visitation was established three weeks ago, that portion of the borough which is within the Sculcoates Union was divided into nine districts, each of which was under the care of a district surgeon, and that a staff of visiting officers was appointed to visit in each district from house to house, especially where their services were most required. Six dispensaries were opened in the various parts of the Union, at which medicines were dispensed gratuitously at the order of the surgeons and visitors; and at two of these medical attendance was given at night for the relief of urgent calls. Two hospitals were provided for the reception of destitute persons attacked with the disease; and a house of refuge was opened as a shelter for the families of the sick, whom the medical attendant considered not to be safe at their own homes, or whose houses required emptying and thorough cleansing. This system came into full operation on the 20th of last month, and I purpose now to report briefly to the Sanitary Committee of the Sculcoates Board how far it has been carried into effect according to the instructions, and what have been the results of our operations; and especially to call attention to the present state of the public health, and the extent to which it may be thought necessary to persevere in or relax these preventive measures. In forming an estimate on these points it must be borne in mind that the object of the visitation system is *prevention* rather than *cure*; it aims at searching out and detecting disease in its early and only manageable stages; because it is found that the poorer classes are too ignorant, too careless, or too apathetic to apply for a

\* It may be proper to state, that the greater proportion of the cases of cholera mentioned in Dr. Ayre's list occurred before the introduction of the preventive measures, only 214 having been reported after that period.

remedy spontaneously, until driven to it by symptoms which show the case to be beyond human control. Another intention of the system is to discover the location of the disease at any particular time, and to determine the point where it is most rife, and by concentrating our preventive force upon such points to check the evil in the bud. It further tends to give confidence, hope, and courage to the public mind at a time when these qualities are most likely to fail, and when their failure is attended with the most disastrous consequences. A further important result of the visitation system faithfully carried out is the discovery and exposure of nuisances in and about the houses and premises of the poor, which would otherwise escape detection; of these we have had 66 reported, all of which have received the notice of our inspector. Many destitute persons have also received relief by the same agency. Lastly, this system is intended to provide certainly and promptly the best known means of succouring those unfortunates who have already become the subjects of the malady in its confirmed and dangerous form. A reference to the Tables in the Appendix will indicate how far these results have been attained during the three weeks that the system has been at work. It appears by them that about 2,600 cases of disease in various grades have been discovered by the surgeons and house-to-house visitors; of these 2,234 have been cases of simple diarrhœa, the great majority of whom would undoubtedly have never applied for relief at all, and many others only when confirmed cholera had set in; 218 are cases exhibiting symptoms approaching to cholera; and 130 were discovered in a confirmed state of the disease. It is very gratifying to remark, that of those discovered in the earlier stages only 10 passed into cholera while under treatment; a number which shows on the one hand the tendency of these forms of disease, when uncontrolled, to pass into cholera, and on the other, how efficacious have been the means employed in averting this deplorable result. We further remark, that of 218 cases of rice-water purging,—a very advanced form of the disease, on the verge, in fact, of cholera,—only five passed into cholera, 213 having been saved by being timely discovered and treated. The gross number of recoveries has been 1,615. It is true that the disease, following the well-known law of epidemics, had reached its climax, and was on the decline before this system was introduced. Yet we had melancholy evidence that its virulence was far from being exhausted in the sad cases which occurred in our own staff, as well as many others about the same time in the higher walks of life; while the mortality among the humbler classes, who were the objects of this visitation, maintained a singularly equable and rapid decline.

“The unanimous testimony of the visitors is in favour of the high value which the poor set upon house-to-house visitation as a mark of attention to their welfare; and of their readiness to give information and assistance, and their thankfulness for the relief afforded.”

*Saville-street, October 15, 1849.*

Dr. Cooper gives the following Table of general results of the visitation to October 11.

Diarrhœa . . . . .	2,174
Approaching cholera . . . . .	208
Cholera . . . . .	129
	————— 2,511

<i>Deaths.</i>	
Cholera . . . . .	49
Diarrhœa . . . . .	17
	— 66
<i>Recoveries.</i>	
Diarrhœa . . . . .	1,421
Approaching cholera . . . . .	88
Cholera . . . . .	77
	————— 1,586
<i>Passed into Cholera.</i>	
Diarrhœa . . . . .	10
Approaching cholera . . . . .	5
	— 15
<i>Attended by Night Officers.</i>	
Diarrhœa . . . . .	132
Approaching cholera . . . . .	39
Cholera . . . . .	25
	————— 196

In reference to the preceding Table, Dr. Cooper makes the following remark, which confirms what has been uniformly observed elsewhere, that the early discovery and treatment of cholera cases diminishes the mortality in a striking degree. He says—

“The total number of cholera cases discovered by the visitors in the confirmed stage of the disease, and treated by the surgeons, has been 129, of whom 49 have died. This is rather a favourable per centage compared with the mortality which the disease has uniformly, and under every form of treatment, exhibited.”

The experience of Hull, when contrasted with that of Sheffield, to be presently described, affords another evidence of the great saving of human life which might have been effected had the recommendations of the General Board of Health been adopted when they were first given; while it ought also to raise the question of resorting to other means for protecting the public during epidemics, than trusting implicitly to the management of Boards of Guardians. The value of human life is so great, that were there only the possibility of such another catastrophe as occurred under the mismanagement of the Guardians of the Hull parishes, it ought to lead us seriously to inquire whether more efficient agents should not be selected to cope with similar emergencies should such unhappily arise.

#### V.—REPORT ON THE MEASURES ADOPTED BY THE SHEFFIELD BOARD OF GUARDIANS FOR THE RELIEF OF CHOLERA WITHIN THE UNION.

SOON after Asiatic cholera appeared in this country, a few members of the Sheffield Board of Guardians, in conjunction with their clerk, Mr. Watkinson, began the work of preparation for the anticipated outbreak of the epidemic. They took the documents published by the General Board of Health as their guide, and proceeded with the determination of doing all that could be done, and at whatever cost, to save the town from the danger which impended over it.

Active measures were taken for continuous cleansing and for keeping the town free of nuisances, and suitable officers were appointed for the purpose, the object being to remove as far as practicable every



source of atmospheric impurity, so as to enable the population to resist the epidemic influence when it came upon them. The gentlemen on the Sanitary Committee availed themselves of every means of information, and when the advance of the disease became more threatening, they summoned the medical profession together, and consulted with them in regard to the proceedings which ought to be followed.

The results of this cordial co-operation were most beneficial. With a thorough knowledge of the habits of the people, and an enlightened appreciation of the importance of the great leading points in the preventive measures laid down by the General Board of Health, and guided also by the results of experience elsewhere; the Committee agreed to a certain definite plan of procedure of a medical preventive kind, to be put in operation as soon as the epidemic appeared.

It is hardly possible to overrate the importance of these preliminary steps. Unlike other Boards of Guardians, they had used the most available means for preparation, and they had nothing to seek when the emergency arrived. All their plans of operation were settled, and their machinery arranged. In this, the Sheffield Board of Guardians stands almost alone. They are, I believe, the only body in the country who had the enlightenment to perceive the full extent of their duty, and the courage and energy to perform it. This I believe was done without regard to expense, and in the firm conviction that apart altogether from the humanity of the course they had taken, the rate-payers would be large gainers in the ultimate saving of widowhood and orphanage which was, without doubt, effected.

In addition to the ordinary cleansing operations, the leading points which were kept in view in the plan of relief measures adopted, were: 1st. Directing the medical treatment almost entirely against the premonitory period of the disease. 2nd. The removal of the healthy from infected houses and neighbourhoods. 3rd. The use of quicklime wash to a large extent as a preventive measure. 4th. The home treatment of cholera cases.

It will be perceived that the Board of Guardians adopted those principles so often fruitlessly enforced on other similar bodies by the General Board of Health.

About the middle of July last, two imported cases of cholera occurred in Sheffield, but the disease attacked no one else in the town at that time. On the 26th of August, however, a sudden outbreak of diarrhœa took place, which in the space of three days spread over the whole town, but affected most severely those parts along the river banks, which are usually affected by typhus. One elevated district called the Park, which is chiefly inhabited by colliers, and in a bad sanitary condition, also suffered. As soon as this diarrhœa appeared, the circumstance was reported to the Sanitary Committee. The medical men who were to act were immediately called together. The dispensaries were opened. Notices were issued, and the whole machinery, previously prepared, was set in motion at once.

On the 4th of September, a week after the medical relief measures were in operation, the first cases of cholera occurred in Bald-street, opposite the dam head on the river Don, and from that period to the final disappearance of the epidemic, there were brought under treatment the following proportion of cases:—

	Diarrhœa.	Cholera.	Deaths.	Recoveries.
	5319	76	46	25*

An analysis of 2,196 of the cases classed as "Diarrhœa" in the preceding table gives the following result:—

Simple diarrhœa . . . . .	1,522 = 69.0 per cent.
Dysentery . . . . .	424 = 19.4 ,,
Diarrhœa, with vomiting . . . . .	130 = 6.0 ,,
Ditto ditto and Cramps. . . . .	39 = 1.8 ,,
Rice-water evacuations . . . . .	81 = 3.8 ,,

We have an epidemic of this character, attacking nearly the whole surface of a town, and no person who looks at the nature of the cases can doubt that they would have exhibited a much greater proportion of cholera attacks, had the preparatory steps already alluded to, not been taken. The population was, in fact, enabled to resist the epidemic influence and the object of the sanitary measures was to a great extent fulfilled. The main localizing cause in Sheffield was bad water and the dampness of the river banks, but especially the former. The town generally has a good water supply, but in the localities affected, as well in Sheffield as in the neighbourhood, the water used was largely impregnated with animal matter from sewerage and from street and road washings. This was the real reason, in my opinion, of the great majority of the attacks. The removable causes were summarily and effectually dealt with, and hence districts escaped with diarrhœa in Sheffield which in other towns would probably have been the seats of cholera. Causes which there were no legal powers to remove were left in operation, and under these cholera localized itself. Perhaps no more instructive illustration of the connexion between epidemic attacks and local sanitary defects could be given.

The following are the details of the plan of medical relief which was adopted.

Sheffield was divided into seven districts with a day and night station to each. These stations were placed in the houses of mechanics and others in humble circumstances. A notice was drawn up telling the people where to apply for aid. It was posted on the walls, and a copy placed in every shop window and beer-house in the town. Copies were also placed in all the manufactories, but they were not distributed from house to house. Subsequently, however, it was found to be necessary to make house-to-house distribution of another notice, in order to warn the people more thoroughly.

At each of the seven stations, a quantity of astringent mixture was provided. Printed directions as to the amount of dose for each age were placed in the hands of the persons who distributed the medicine, for their guidance, and each applicant received a dose on the spot. His address was then entered in a printed form, and sent to the medical officer of the district, who visited the case at home. A printed form was provided for the prescription of the medical officer, and which was afterwards taken to the central dispensary at the workhouse, where the medicine was made up.

\* The results of five cases are not given.



Twelve qualified medical men were employed for this district service. They followed up the treatment of the diarrhoea cases, and in going round they took care to warn the people of the need of early application. They prescribed for many cases that might be brought under their notice, and they inquired if any persons were sick in the neighbourhood, with the view of visiting them.

On inquiry at a station situated in one of the districts infected by cholera, I was informed that about one-third only of all the applications made, were those of individuals who came for medicine for themselves, and none of them were stated to be very ill, while the remaining two-thirds were applications for persons confined at home. In these cases it was customary to send a dose of medicine to be administered to the sick, while the case was reported to the district medical officer, as in the instance of personal applicants.

On arriving at the house of the patient, the district medical officer treated the case, unless it happened to be one of cholera, in which event he filled up a printed form, and transferred the case to one of the two hospital surgeons, who took charge of all cholera cases. At the same time, he filled up a printed form for a nurse. If any of the family were labouring under diarrhoea, he filled up another printed form, and had the patient sent to an hospital for such cases. The remaining inmates he reported on a printed form, as fit for admission to the House of Refuge. All these filled up forms were sent to the Clerk to the Guardians, who saw that they were attended to.

There was one special house-to-house visitor for infected districts. All cases of cholera, with their residences, were reported to this gentleman, who, on receipt of the report, took a general sanitary and medical inspection of the affected locality, and treated any cases he might find in it. He visited the locality several times a day.

The home treatment of cholera cases was strictly carried out, wherever practicable. There was a small cholera hospital for destitute persons, but very few were admitted into it. A large and well paid staff of nurses was constantly available, and as many as 25 have been in employment in the Union at one time.

There was one large and commodious building used as a refuge for the town of Sheffield. It was well situated, and every way adapted for the objects in view. The value of this important instrument in saving human life was fully appreciated. The persons admitted into it were carefully inspected, and all severe diarrhoea cases that occurred among the inmates were removed to the proper hospital. A good diet was provided for those that were well. The results of this important preventive measure were most satisfactory. There were 145 persons admitted from infected houses, about one half of whom became affected with diarrhoea, but owing to great vigilance in detecting the cases, only two deaths occurred. Mr. Micklethwait, who had the medical charge of the refuge, states that "all the inmates improved materially in appearance and bodily vigour, and expressed themselves grateful and cheerful for the kindness shown them."

Along with these preventive measures, great care was taken of the sanitary state of affected localities, and all unhealthy houses were lime-washed and shut up.

It will be perceived, that Sheffield exhibits the first and only

instance of a faithful and voluntary application of those principles of preventive medicine which the General Board of Health has been so long endeavouring to enforce. The authorities recognized the *unity* of the preventive measures, and the necessity of working them all together, in order to obtain the best practicable result. While in almost every instance in which the General Board of Health has been called on to interfere, measures have had to be taken hurriedly and on the spur of the moment, not only to prevent or limit the ravages of the epidemic, but to endeavour by every means to save human life from instant danger. The plan adopted in Sheffield, though somewhat too complicated, was still a successful one. It comprehended the elements of procedure combined together, which elsewhere it had been necessary to use in greater individual pre-eminence, to suit emergencies.

The small number of cholera cases, when contrasted with the large number of those of diarrhoea, is a sufficient proof of the success of the medical relief measures, and Mr. Watkinson states that "The medical officers recollect no cases of diarrhoea which passed into cholera after they commenced treating them." It will be perceived that this result was obtained through dispensaries with a modified form of medical inspection. It proves that the plan was suitable for the intensity of the epidemic attack; but I have given sufficient evidence elsewhere to show that in severe seizures a rigid medical visitation is indispensable. Even the cholera cases which did occur in Sheffield were not seen in the early stage, for Mr. Watkinson says that they "were either in a state of collapse, or bordering on it, when they were found." Had the visitation of houses been so active as to have ensured the early discovery of all these cases, either in the premonitory stage or before the period of collapse, the carrying out of the preventive measures would have approached as near to perfection as possible; but the occurrence of so many cases in the stage of collapse confirms the experience of other localities as to the danger of trusting to the poor to apply for medical aid of their own accord. As has been already stated, I attribute the comparative immunity which Sheffield enjoyed from developed cholera, and the appearance of the epidemic in its milder forms, mainly to the very efficient preparatory measures which were instituted and actively carried out for so considerable a time before the disease showed itself among the population.

Cholera appeared also in part of Sheffield, situated in another Union. The usual preventive measures of the General Board of Health were in this instance also successfully carried out by the authorities.

The details given in the preceding Reports appear to be sufficient to show the methods which have been usually adopted in giving effect to the regulations of the General Board of Health; and in order to avoid repetition, I shall add a few notes on various other towns, instead of reporting every minute particular.

LIVERPOOL.—The preventive measures were carried out in this large town under the superintendence of Dr. Duncan, officer of health to the borough, who states that the chief localizing causes of the epidemic were "The ordinary local and removable causes of disease; to wit, filth, want of drainage, offensive cesspools, &c., and particularly overcrowding," over the last of which, however, the authorities have no power.

"Local outbreaks of more than usual intensity were in almost every instance associated with the usual sanitary defects, in particular want of drainage, filth, and overcrowding, more particularly the latter. There were cases in which internal filth and overcrowding could not be assigned as prominent causes; but in these the streets were undrained; and again, there were cases of sewered streets suffering in more than an ordinary degree, but where the houses were overcrowded and filthy in the interior. In the first category may be mentioned Burlington-street and Hornby-street, in which 144 deaths occurred, and neither of which were sewered at the time."

Dr. Duncan gives the names of a number of other undrained streets, which were not crowded, and yet suffered severely, and proceeds as follows:—"In the second category, of *sewered streets suffering severely from the epidemic*, may be placed Addison-street, Hodson-street, Oriel-street, and Paul-street (and these are the only instances of the kind I can recollect): the three first named, although sewered, are crowded with the lower class of Irish. Paul-street, also sewered, cannot be classed with the other streets named, in point of overcrowding; but as if it were determined that the exception should prove the rule, an *inefficient supply of water* was complained of, both by the inhabitants and by the medical visitor of the street."

Several instances are given by Dr. Duncan, in which the proximity of offensive slaughter-houses appeared to have determined fatal attacks of the disease. An instance is mentioned of a small court of houses, the cellars of which contained stagnant water, which it was found impossible to remove for want of a sewer. In this court 11 people died of cholera in a single week.

"At the outbreak of the epidemic the town was in a *comparatively* good sanitary condition, from efforts previously made; but since the outbreak the courts in the worst districts have been regularly washed out, the exterior of the houses in those courts have been lime-washed, and the interior of nearly 3,000, in addition to those which have been voluntarily cleansed by the owners or occupiers. Extra scavenging was also employed."

In Liverpool, as in every town severely visited, the most extraordinary apathy was found to prevail among the poor in *making application* for medical relief, however freely it was offered to them. Dr. Duncan states, that "Bowel complaints, particularly when unattended with pain, were looked upon as trifling, and not requiring medical treatment. Many individuals were collapsed before they or their friends thought it necessary to apply for medical attendance." It was in order to meet this fatal neglect, that the house-to-house visitation was instituted, but even in districts where it was in operation, many cases of diarrhœa were allowed to go on unheeded, "chiefly from the obstinacy of the parties in refusing to believe that painless diarrhœa could be attended with danger, notwithstanding the plain and repeated warnings which were given."

Two plans of visitation were tried in Liverpool, one chiefly by lay visitors, the other by medical practitioners, but from a variety of causes of a local nature, already known to the General Board of Health, the system was not so fully carried out as it was elsewhere. Nevertheless, there can be no doubt, that a great number of lives were

saved by it. The following is Dr. Duncan's return of the number of cases discovered during a period of about three and a half months, the largest number of medical visitors employed being 25.

Diarrhœa . . . . .	10,452
Diarrhœa approaching to cholera . . . . .	840
Cholera cases . . . . .	1,391

About a dozen corpses are also stated to have been discovered. The number of families inspected by each visitor varied from 500 to 1,000 a-day, and in addition to the discovery of premonitory cases, these officers reported many instances in which local causes of disease existed in their districts. Dr. Duncan states, that the medical men who were employed in the work of visitation, made many objections to it at the beginning, which in time gradually subsided, and that the visitation was "very efficacious in diminishing the number of cases," while the poor were "grateful, with very few exceptions." The opinions of the medical visitors as to the probable amount of cholera prevented by the measures adopted is thus stated by Dr. Duncan; some believe "that diarrhœa, premonitory of cholera, can seldom be distinguished from ordinary diarrhœa previous to the rice-water stage, and others believe that the greater proportion of the cases would have passed into cholera without treatment."

It has been stated, that both medical and lay visitation were adopted in Liverpool; the former was first introduced, in compliance with the special regulations of the General Board of Health, but it was discontinued by the Committee of the select vestry, and a system of lay visitation was put in force instead. After the *lay* visitation had been in operation for a fortnight, the *medical* visitation was again restored, on account of the renewed interference of the Board. It may be supposed that a fair opportunity would thus be afforded of testing by another kind of statistical evidence, not only the comparative efficiency of the two systems, but also of the whole method, in diminishing the number of attacks, and the consequent mortality of the epidemic. The following is the result of this striking experiment as given by Dr. Duncan:—

"During the two weeks in which *lay* visitation was substituted for *medical* visitation in the parish of Liverpool the cases *discovered* fell from 1,382 in the previous two weeks to 766; and in the following two weeks, when the *medical* visitation was resumed, the cases *discovered* again rose to 1,484. At the same time the deaths from cholera in the parish rose from 582, in the two weeks ending August 4th, to 790 in the two weeks of *lay* visitation ending August 18th, and again fell in the two weeks (of resumed *medical* visitation) ending September 1st to 620, after which they steadily declined."

It may be remembered that Liverpool has been for a short period under the operation of a Sanitary Act; and although there has not been as yet sufficient time to carry it out thoroughly, it is gratifying to know that already its utility becoming apparent. The following facts in regard to this matter are stated by Dr. Duncan in his Report:—

"As an instance of the benefit derived from sanitary improvements, I may mention Lace-street, which, as you know, was formerly one of the most unhealthy streets in Liverpool. In 1847 it was undrained; and in that year about 200 deaths from fever occurred in the street, in

addition to about 250 more from other causes. About the end of 1848 it was sewerred; and during the epidemic of the following year (1849) the deaths from cholera were only 36; the total deaths in the borough from cholera falling little short of those from fever in 1847."

"With regard to *registered lodging-houses*, in a certain number whose history I have been enabled to trace, about 150 cases of fever occurred annually previous to registration (excluding years of severe epidemic visitation, such as 1847). During last year the cases of cholera in those houses were 98. In estimating the value of this fact, it must be remembered that the total cases of fever in the town in the years when 150 cases occurred in the lodging-houses (unregistered), were only about 5000; while last year there were not less than 10,000 cases of cholera in town, and only 98 in the same houses, registered and under sanitary inspection. So that, in fact, the cholera in the houses *after* registration was only in the proportion of one to three as compared with fever *before* registration."

Liverpool affords a striking illustration of the beneficial effect of another important sanitary measure, namely, the abolishing of cellar habitations, and sending people to inhabit the *surface* of the earth, as they were intended to do. This illustration is given by Dr. Duncan in a published letter, and is drawn from the results of the fever epidemic of 1847, and the cholera of 1849. The deaths from each epidemic having been nearly equal throughout the borough. In a certain district of the town *before* the fever of 1847 the cellar population amounted to about 12 per cent. of the entire population, and the fever carried off upwards of 500 of the inhabitants of the district. When the closely allied epidemic of cholera appeared, the inhabitants of the cellars in the same district had been reduced to less than 2 per cent. of the entire population, and deaths from cholera were only 94.

WOLVERHAMPTON UNION.—Cholera attacked nearly the whole of this Union, but was especially severe at Bilston and Willenhall, on account of the deplorable sanitary condition of those towns. After the epidemic had been in existence for some time, I was directed to visit the district, and as it appeared that nothing effectual could be done to remedy the obvious localizing causes of the epidemic, especially at Bilston, I suggested, in addition to the usual cleansing and lime-washing operations, &c., that the *special* points requiring attention were, first, the removal of the people to the greatest practicable extent, and second, a constant medical inspection of the whole affected districts. It was found that no suitable buildings could be obtained for places of refuge, and in order to save time the General Board of Health applied to the Board of Ordnance for a supply of tents. A quantity was immediately sent down, and more were offered if requisite. The accommodation thus afforded was made use of at Wolverhampton, but in Bilston and Willenhall, the places where it was more immediately required, I am sorry to say that such was not the case. There were eight medical visitors employed, and Dr. Mannix, who acted as superintendent of the Union, thus reports on the results of the two-fold form of prevention adopted.

"In addition to the duty of prescribing for diarrhœa, the house visitors made daily returns of the various nuisances discovered in the districts, and also of the cases of destitution, and, being for the most

part accompanied by respectable inhabitants, private benevolence was readily directed to the proper quarter.

"Being in possession of the requisite information daily, I was enabled with great effect to remove to the tents large masses of the people, *i. e.* from Wolverhampton, in some cases as many as 40 at a time, who on the removal of the nuisances and purification of their dwellings were restored to their homes. The tents were found to be admirably adapted to provide shelter, and during every variety of weather afforded ample protection, the health of the people being not only preserved, but improved in a marked degree. I have to express my regret, that similar advantages were not afforded to Bilston and Willenhall, where, although tents were provided, local Boards of Health discovered disinclination to supply that accessory accommodation which was essential.

"The result of the house visitation was, that 4093 houses were visited daily; that 5552 new cases were discovered and prescribed for, being at the rate of 23 new cases discovered by each visitor daily; and that no sooner were all the cases of diarrhœa fairly brought under treatment than the disease suddenly disappeared; which result might, indeed, fairly have been calculated on, since the average duration of diarrhœa, when treated, did not exceed 48 hours, and the instances of cholera occurring without being preceded by diarrhœa did not, as far as I was able to ascertain, exceed three or four during the whole epidemic."

DUNDEE.—The following extracts are taken from the report of Dr. Malcolm, who was chairman of the Medical Board of the parishes:—

"On the evening of the 29th May the first three cases of the disease simultaneously broke out in Fish-street, one of the most crowded, low-lying, and unhealthy parts of the town. None of these could be traced to contagion. From the middle of July the epidemic spread rapidly over the town, but usually operated most severely where circumstances favoured its development. This was in general in localities known as being particularly unhealthy, and almost invariably the seat of typhus when it prevailed." In describing one part attacked, Dr. Malcolm states, that it "lies on an elevated part of the town, but the houses in it, where the disease appeared, were dirty, low-roofed, and badly ventilated; some nuisances also existed in their immediate vicinity. The quantity of good water is very deficient in this neighbourhood." He describes another severely affected locality as "low lying, damp, overcrowded, and deficient in the supply of water. The disease was very fatal here; out of a population of about 100 about 40 died from it, and some respectable people in the neighbourhood fell victims." Other affected districts are stated to be "low-lying, the lanes, courts, and closes entering from them are numerous, narrow, dirty, and much overcrowded. The houses are filthy, and the stairs leading to them are seldom washed down. In these localities, during the whole time the disease remained in the town, cases were ever and anon occurring." A large crowded block of buildings where the disease located itself is thus described:—"Dudhope-crescent consists of about 17 large houses closely built together, and each containing five floors. They occupy a space of about an acre of low-lying damp ground. Immediately to the east of this crescent is a highly-embanked railway.

On the north the ground rapidly rises higher than the tops of the houses. On the west, separated only by a street, are two large mill-ponds; beyond these is placed the public slaughter-house, and a little further to the west of it is an open space of ground, on which the refuse of the town is deposited. This crescent contains a population of about 1,700, who consist of respectable working people. The houses are cleanly kept. Fifty-seven deaths from cholera occurred here."

"It was generally found that wherever the disease broke out with much violence, some local cause could be detected to account for it. Certain localities of the town, however, which appeared to be in a state to favour its propagation, escaped, with the exception of a few sporadic cases."

The nature of the attacks is thus described by Dr. Malcolm:—"In many instances persons apparently in good health, after a single profuse discharge from the bowels suddenly became collapsed, and died in 10 or 12 hours. Nearly one-fourth of the fatal cases were of this kind. The majority of cases, however, were preceded by diarrhoea of from a few hours up to six or eight days' duration, before the marked symptoms of cholera appeared."

The following were the arrangements carried out by the parochial authorities during the earlier part of the epidemic:—

"The town is divided into three districts, to each of which a medical officer is appointed, whose duty it is to attend and prescribe for the sick poor. Immediately after the appearance of the epidemic an additional medical officer was appointed to each district, and by the medical staff thus constituted most of the cases of cholera which occurred in June and July were attended. Wards in the infirmary were opened sufficient to accommodate 12 cholera patients. Many nuisances were removed from different parts of the town. The lanes and closes were well washed by means of the fire engines and water-plugs; and wherever the disease existed they were sprinkled with chloride of lime, and the inhabitants were urged by the medical officers and the parochial authorities to make early application for medical aid when they were seized with any of the premonitory symptoms of cholera, and to be careful in keeping their houses clean, and to avoid habits of dissipation."

These means were, however, found to be insufficient to meet the emergency. Dr. Malcolm states, that "great difficulty was often experienced in inducing the patients to make early application for medical assistance, and from this cause diarrhoea was often allowed to go on unchecked for three or four days, till it ended in collapse." A very striking instance of this fatal neglect is given by Dr. Malcolm, which will be found noticed elsewhere.

In the end of July I was directed by the General Board of Health to proceed from Leeds to Dundee to organize the needful preventive measures, Dr. Malcolm's account of which is as follows:—

"On the 30th July Dr. Sutherland arrived here, and more energetic and effectual means were adopted. Each of the three districts was then subdivided into three, and a medical officer was appointed to each of the subdivisions. In this way nine medical men were employed in attending cholera patients. Two advanced medical students were also appointed to each district, who daily went from house to house in all affected localities, each of them daily visiting about 200 houses, in-

quiring into the state of health of the inhabitants, carrying with them medicines, and prescribing for cases of diarrhoea and premonitory symptoms of cholera, and urging the necessity of early application for medical relief. The students immediately reported all urgent cases to the medical officer of the district, and a list of cases of diarrhoea, premonitory symptoms of cholera, and cholera was daily made up and forwarded to the General Board of Health. Of the nine medical officers three in rotation, with one of the students, remained in attendance during the night, in a house used by the Parochial Board for their general business. This house is in a central part of the town, and is well known to the poorer classes, who were duly informed of the arrangement. In this way every urgent case was promptly attended. Six dispensaries were opened in various parts of the town, where medicines were prescribed to all necessitous persons who were suffering from any of the premonitory symptoms of the disease."

"By orders of the Factory Inspectors a daily medical inspection of all the workers at the different mills was instituted" (this was done at the instance of the General Board of Health); "additional accommodation was procured for cholera patients in the infirmary, and for convalescents. A House of Refuge was also erected, into which the surviving inmates of any house where a death from cholera occurred were freely admitted, and kept till their own house was cleansed, washed with quick lime, and properly dried." "The inmates of the House of Refuge were examined twice a-day by one of the medical officers, and, though many cases of diarrhoea occurred amongst them, only three or four were seized with cholera, all of whom were immediately removed to the infirmary. None of the medical officers or students were seized with cholera, nor were any of the nurses or others connected with the infirmary."

"The dirty lanes and closes all over the town were cleaned and washed with quick lime, and also most of the houses occupied by the poor, in which a death from cholera took place.

"All the members of the medical staff here, are of opinion, that by actively following up these preventive measures, many cases which would otherwise have run on to cholera, were found out and successfully treated in the premonitory stages of the disease, and in this way, many valuable lives were saved.

"The washing with quick lime and the removal of the healthy from the diseased localities were also found most useful in preventing the spread of the disease, and very few cases of cholera were reported from the houses which had been washed."

The following were the cases treated under the visitation system:—

PREMONITORY CASES.				CHOLERA.	
Dispensary Cases.	Diarrhoea Cases Discovered by Visitors.	Cases approaching to Cholera Discovered by Visitors.	Total Premonitory Cases treated.	Premonitory Cases passed into Cholera.	New Cases.
3670	6417	705	10,792	64	924

Of the premonitory cases reported as having passed into cholera, 7 were diarrhœa cases, and 57 was the whole number of those caught in the rice-water purging stage; all the rest were cured.

HAMILTON.—This small town, with a population of about 9000, suffered severely. The outbreak of cholera began on the 24th December, 1848, and continued till March 7th, 1849, during which period 440 cases of cholera and 251 deaths took place. A house-to-house visitation was begun at my request on the 26th January, 1849, and from the commencement of the disease till the 28th, the date at which we may suppose this measure came into full operation, the cases of cholera had been 209 and the deaths 128. The following are the statistics of the epidemic under the visitation system.

PREMONITORY CASES.			CHOLERA.		
Dispensary Cases.	Diarrhœa Cases Discovered.	Rice-water Purging Cases Discovered.	Passed into Cholera.	New Cases.	Deaths.
170	659	166	21	231	123

Of the cholera cases, 15 are reported as having occurred in private practice, and in 15 instances the patients, though visited in the diarrhœal stage, denied being ill. It is worthy of remark that on one day all the cases of cholera, 3 in number, took place in houses which had been accidentally omitted in the daily visitation. No deaths took place in diarrhœa or rice-water purging cases, and 19 of the former passed into the rice-water purging stage of the disease. No fewer than 91 cholera cases were reported as "sudden," but on close examination most of the seizures were found to have had neglected premonitory symptoms, and the majority of these cases must, therefore, be placed among those in which the patients denied being ill. Dr. Steven, who acted as Medical Superintendent, reports as follows:—

"Previous to my entering upon duty, diarrhœa and rice-water purging were not taken into account at all. From the 20th to the 25th (January), there were known 17 of the former alone, and on the 26th, when visitation from house-to-house was begun, the number rose all at once to 20, after which it kept high for a considerable time. To any one at all conversant with the peculiar character of cholera epidemics the foregoing facts cannot fail to be interesting. They afford the strongest evidence of the advantages of a system of finding the disease and treating it, at its earliest period: a system of daily visitation from house-to-house, such as has been carried on here, with not less happy results than have been obtained by it in other towns similarly visited."

The usual effect of the system of visitation on the ratio of mortality was also observed in Hamilton. Out of 209 cases of cholera occurring before the plan was adopted, 128, or 61 per cent., died; while of 231 cases occurring under the house-to-house visitation, 123, or 53 per cent., were fatal. These results show the epidemic to have been of great severity, but they also prove the benefit of the early treatment insured by the discovery of the cases.



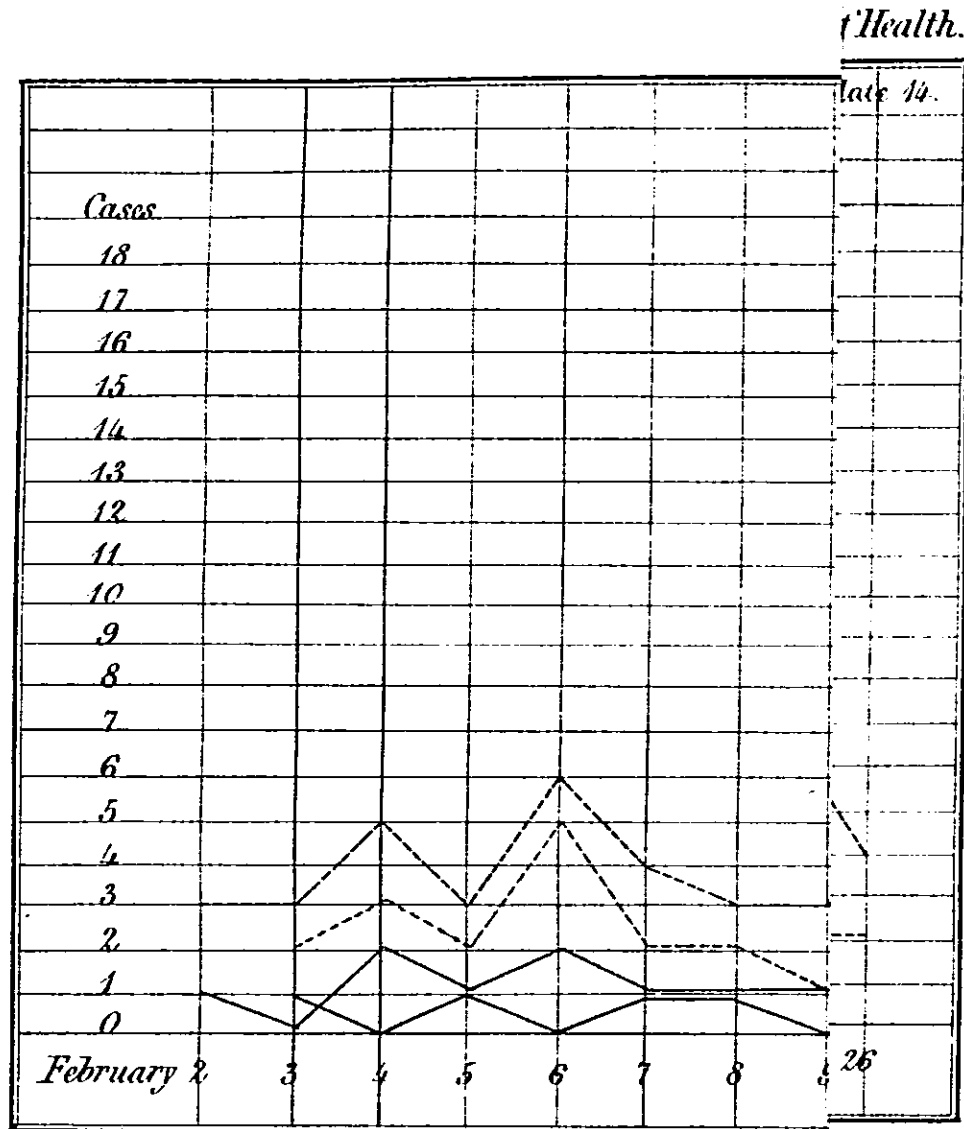


Diagram of an entire epidemic at Glengarnock, and the space between it, and line and the continuous Red line represents developed Cholera. The continuous Red line represents

rt.  
Old Jewry.

GLENGARNOCK IRON WORKS.—While cholera prevailed in Glasgow it attacked a number of villages in Ayrshire, chiefly inhabited by persons engaged in the manufacture of iron. I select one of these as an illustration, because the population was small in number, and was completely under the control of the medical officers, so that every epidemic case for each day was known and tabulated. The locality alluded to is the Glengarnock Iron Works. The village contains about 1183 people, and was placed under careful inspection by Dr. Miller, and Mr. Carleton who was engaged to aid in carrying out the needful preventive measures. Mr. Carleton states in his report that the proprietors did a great deal to protect the people by providing a proper water supply, cleansing, whitewashing, and fumigating of houses, and in warning them to be temperate. Whenever the diarrhoea appeared "the system of house-to-house visitation," says Mr. Carleton, "was put in full force, the inhabitants were seen often during the day, and we discovered many cases of diarrhoea with rice-water dejections, which from early treatment we were at once able to check. In this manner it is not difficult to perceive by the report that the severity of the epidemic was in a great measure averted by putting the preventive system in full operation, thereby saving many lives."

Dr. Miller also writes—"I have attended a great many cases of diarrhoea at Glengarnock Works and the neighbourhood, both before and since Mr. Carleton came here; and I have no doubt many of these would have gone on to undoubted cholera had they not been treated early. From what I have seen of cholera, I am of decided opinion the house-to-house visitation is the most successful plan for suppressing the disease. We had no regular House of Refuge, but we made use of the uninhabited houses for that purpose. I may remark that three-fourths of the diarrhoea cases were discovered through the house-to-house visitation system."

In another part of the report Mr. Carleton describes the miners of this district as "a most reckless and dissipated class of beings," and states that in some cases they refused to take medicine for fear of being poisoned.

I have transferred the statistics of the attack to the diagram in Plate 14, but in this case the epidemic is treated as a unity; that is, each curve marks the total epidemic cases between it and the base line, so that the real index of the progress of the epidemic is the dotted black line, while the lines below it mark the progressive stages of the disease.

COATBRIDGE.—This town is situated in Old Monkland parish, and is the centre of a large mining and iron district. Cholera prevailed extensively over the whole neighbourhood, but the statistics do not afford sufficient data to show the precise results of the preventive measures employed. These were, however, the usual cleansings, dispensaries, and house-to-house or district visitation by medical officers. The returns from the town of Coatbridge, which contains a small part only of the population, namely about 4000, give the following proportions of cases, which prove the extent to which the disease prevailed over the district and the efficacy of the means adopted.---



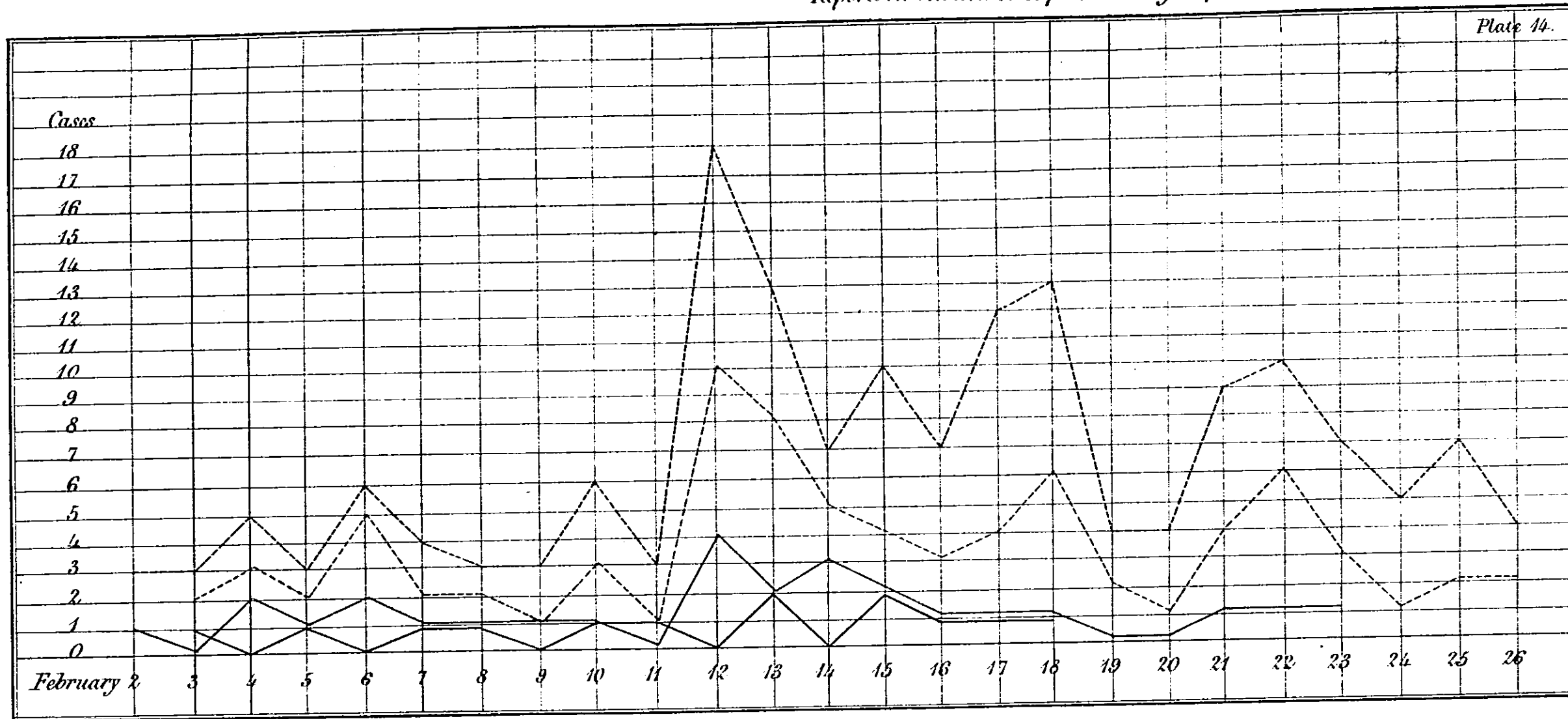


Diagram of an entire epidemic at Glengarnock Iron Works, Ayrshire. The dotted Black line represents the numerical boundary of the epidemic, and the space between it, and the dotted Red line the amount of Diarrhoea Cases. The space between the dotted Red line and the continuous Red line represents the number of Cases arrested in their passage from the rice water purging stage to developed Cholera. The continuous Red line represents the number of Cholera Cases, and the continuous Black line the number of deaths.

D. Sutherlands Report.

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GLENGAR attacked a m engaged in illustration, completely u epidemic ca alluded to i about 1183 Dr. Miller, a the. needful } that the prop a. proper wa houses, and i appeared "th " was put in day, and w dejections, w check. In t that the sev putting the j lives."

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Diarrhoea . . . . .	2659
Vomiting, purging, and cramps . . . . .	480
Rice-water purging . . . . .	175
Cholera cases . . . . .	107
Deaths from cholera . . . . .	61

CARNBROE.—The village of Carnbroe is situated at a short distance from Coatbridge, and is inhabited by a population engaged in manufacturing iron. It was attacked by cholera on the night of the 31st of December, 1848, and suffered more suddenly and severely than almost any other locality with which I am acquainted. The population does not exceed 1,200, who were all in good health up to the night in question. They had been visited by Dr. Cullen, of Airdrie, in the forenoon, and he states that all were well, and that no premonitory symptoms existed.

The people, however, had been drinking largely, as is the custom at the conclusion of the year, and this no doubt had predisposed them to the disease. At midnight of the 31st, Dr. Cullen was sent for, and on his arrival found the first patient, a man, already in the stage of collapse. Other three cases of cholera were also found, one of which was collapsed, and two cases in the premonitory stage.

In the course of the morning a great number of persons were seized with premonitory symptoms. The disease rapidly extended itself. On the morning of the 1st of January, 1849, five cases of cholera and one death took place. Within the next 24 hours no fewer than 40 cases and 13 deaths had occurred; and such was the terror inspired by the event that one man committed suicide by cutting his throat.

I was informed of the state of this village on the night of the 2nd January, by the manager of the works, Mr. Reid, and directed him to institute a continuous house-to-house visitation, beginning as soon as he could get there; and on the following morning I went out myself to examine into the state of the people. One of the visitors told me that nearly every person in the village was suffering more or less from the epidemic.

Dr. Cullen immediately undertook to see the houses properly visited, and the inspection was kept up till about the end of February, when the disease had nearly disappeared.

Within this period there were about 1100 people attacked out of a population of 1,200. The disease was extremely severe, and required active measures to subdue it. Almost all the cases had a tendency to pass into developed cholera, but such was the result of the speedy and effective treatment adopted, that not more than 240 cases became cholera, about 50 of which occurred at the first outbreak of the disease; and of this number 94 only died, and one-half of the entire mortality took place within the first week or ten days from the beginning of the attack. The premonitory cases averaged from 20 to 30 a day. The great amount of work thrown on the medical staff rendered it impossible to keep very accurate statistics, but the following Table will give the proportions in which the cases and deaths happened each day, for the first three weeks of the epidemic.

Date.	Cases.	Deaths.	Date.	Cases.	Deaths.	Date.	Cases.	Deaths.
1848.			1849.			1849.		
Dec. 31	5	1	January 8	11	7	January 16	4	..
1849.			„ 9	5	5	„ 17	1	..
January 1	40	13	„ 10	4	6	„ 18	..	..
„ 2	19	9	„ 11	13	..	„ 19	4	..
„ 3	11	3	„ 12	10	4	„ 20	1	..
„ 4	13	6	„ 13	11	2	„ 21	..	..
„ 5	15	6	„ 14	9	2	„ 22	..	..
„ 6	7	4	„ 15	7	..	„ 23	2	..
„ 7	2	3						

The result of the system of visitation and the active treatment of the disease is well shown in the preceding Table, and there can be no doubt that a great many lives were saved by it.

LEEDS.—Shortly after the occurrence of the first cases of cholera in Leeds, in July, 1849, I was directed by the General Board of Health to proceed thither from Hull to confer with the authorities in regard to the preventive measures. At that time the disease had subsided apparently in consequence of the thorough cleansing which the town had received from a heavy and continued rain. I made the needful inspections, and stated to the Guardians the principles involved in the general preventive measures which might be required should the disease re-appear. I again returned in the early part of October, and met the medical men in order to ascertain the results which had been obtained, the disease then having been on the decline.

The following was the plan of medical relief which had been adopted:—The ordinary division of the township into four districts for medical relief had been preserved; the medical officer of each district having been held responsible for the management of the disease within his subdivision. Thirteen qualified medical officers and 10 assistants had been engaged by the Guardians, making a medical staff of 27 in all. Nine lay visitors had also been employed.

The duties of these medical officers were—1st. To attend to all cases of cholera within the sub-districts allotted to them. 2nd. To visit throughout the affected localities either every house where the disease was most prevalent, or to make known their presence in the particular street or court in such a way as to attract the attention of the people, and to induce them to give information of any cases of illness that might be in the neighbourhood. 3rd. They carried medicines with them to administer on the spot to affected persons. The lay visitors were employed to aid in this work of visitation, and they generally either sent the cases discovered to the medical officer of the district, or reported them to him. Another part of their duty was to see to the burying of the dead, and to the reporting of all nuisances, or houses requiring cleansing. The police force often performed similar duties, in warning the people, and informing them of the arrangements made for their protection.

There were two dispensaries, one of which was at the workhouse. But in addition, the surgery of every medical man employed by the

Board of Guardians became a place of relief for applicants, who were treated on the spot, and their names and addresses taken down, and subdivided among the district medical officers at stated hours each day. At a meeting which I had with the medical officers, they stated in evidence their unanimous opinion, that, so far as the preventive measures went, they had been efficacious in preventing the development of cases of cholera, while a great number of cases of the disease had been brought under treatment before the period of collapse. Many cases of cholera nevertheless occurred, and this marks a certain incompleteness in the machinery, which was partly attributed to the fact, that, at the period when the disease was at its worst, it was found to be impossible to obtain a sufficient number of medical men to act as visitors. A considerable mortality also arose from the neglect of the people themselves. It may be stated in illustration, that numerous instances occurred in which no application for medical relief was made, although the parties knew quite well what to do; while in other cases persons denied being ill who were actually suffering from diarrhoea when seen by the medical officer on his visitation, and to whom he was subsequently called when they were in hopeless collapse. It had also happened that when the medical officer had called at a house, cases of cholera in a collapsed state were actually in the house at the time, without the inmates giving information. In one house two such cases were found by the visitor, and a number of similar instances were reported. Persons sometimes suffered because they obstinately refused to take medicine.

The reporting of cases was not so thoroughly done as could have been desired, which was attributed to want of time when the disease was most severe. A number of returns had however been sent in, of which the following aggregates will probably give the ratios, though not the whole numbers for the township:—

Simple Diarrhoea.	Dysentery.	Choleraic Diarrhoea.	Cholera.	Premonitory Cases passed into Cholera.
5,129	1,484	1,273	1,090	18

By extending these ratios over the whole township, it will be obvious that a great number of cases were arrested in their progress towards cholera; while the very small number which passed into the developed state of the disease must occasion regret that the visitation could not be made more complete at the time it was most required.

There was a house of refuge and two cholera hospitals opened in Leeds during the epidemic.

In regard to the workhouse, Mr. Taylor, the medical officer, writes,—

“I am happy to say that we have not had a single case of cholera, which I attribute entirely to its premonitory symptoms having been carefully watched;” and he also says, “the visitation from house to house was exceedingly useful, and I doubt not has been the means of saving many lives.”

SUNDERLAND.—By direction of the General Board of Health, I pro-

ceeded to Sunderland on the 13th March, to organize the preventive measures required for the Union. Diarrhoea prevailed chiefly in the more elevated and healthy parts of Bishop Wearmouth, where there were only two or three cases of cholera; but the disease itself was located in Sunderland parish, where the sanitary conditions were most congenial. Few places were altogether in a worse condition than the affected parts of the borough, and I cannot but attribute the comparatively small number of cases, to some extent, to the improved water supply carried into these districts before the epidemic appeared.

The chief means of cleansing I advised, was washing the streets and lanes, and flushing the sewers with the fire-engine, the water for which was forced upwards from the river. The disease immediately subsided on the use of this measure, but increased in a few days, and again nearly disappeared after a heavy rain-fall, which produced a thorough cleansing. The same occurrence took place a second time after rain, and cholera then disappeared entirely.

The preventive measures adopted were house-to-house visitation, an open dispensary, a house of refuge, lime-washing of affected houses, &c. The first return was made on the 17th of March, and the last on the 26th of April, between which dates the following cases had occurred in Sunderland parish:—

Dispensary Cases.	Diarrhoea Cases Discovered.	Cases approaching to Cholera.	Cholera.
243	125	38	77

One peculiarity of the disease in Sunderland was the small proportion of cases which had a premonitory stage, while the diarrhoea cases had a strong tendency to pass into cholera. The following is the history of the cholera cases as reported by the Union medical officers:—

Sudden cases	62
Cases in which the patients concealed the premonitory symptoms	13
Diarrhoea cases which passed into cholera	2
Cases approaching to cholera, which passed into the developed form	1

It is probable that the number of sudden cases reported is greater than ought to have been the case, on account of the difficulty of ascertaining the truth; but it is very satisfactory to perceive how small a proportion of those actually caught in the earlier stages of the disease passed onwards to cholera. The total number of houses visited was 8,418, or about 200 a-day. There were 156 houses, 457 apartments, and 150 staircases and passages, cleansed and washed with quick-lime. Only a small number of persons entered the refuge, but many left infected houses of their own accord.

EDINBURGH.—The city of Edinburgh was the first part of the United Kingdom attacked by cholera. The sanitary condition of the affected districts was at the time most defective, even in regard to the

removable causes of disease; but it is to the credit of the local authorities that they proceeded immediately and vigorously with the abatement and removal of nuisances, and with the cleansing of filthy streets and closes. For the latter purpose, water at head pressure and a hose were used with great advantage. The first set of special regulations issued by the General Board of Health were addressed to the five parishes of Edinburgh and Leith, and contained the usual provisions, which were not, however, carried out with equal efficiency by all the parishes. One provision, that of house-to-house visitation, does not appear to have been adopted in any parish. The preventive measures chiefly relied on were an excellent system of refuge, lime-washing of affected localities, open dispensaries and notices, and adequate medical attendance. There was also one large and excellent hospital opened by the City parish. It was by far the best establishment of the kind in use in any of the districts under my inspection.

The house of refuge of the City parish was a large new school, very well situated and in every way adapted for the purposes to which it was set apart. The wards were clean, lofty, well lighted, and well ventilated, and the inmates were treated with every care and consideration. The total number of persons admitted into the refuge from affected houses was 270, and amongst these there occurred not a single case of cholera.

The lime-washing of affected districts was carried out to a great extent in the worst parts of the Edinburgh parishes. This process appears to have been mainly relied on as the most effective preventive measure, and I know no city or town where it was adopted to anything like the same extent. It was in Edinburgh that the practice was first successfully adopted to put an arrest on the progress of epidemic typhus, and there can be no doubt that it operated as beneficially in diminishing attacks of cholera in the fever localities. The Canongate parish had nearly every close in it lime-washed; and on making visits of inspection I often found the washers at their work. This poor parish escaped with comparatively little disease.

In a communication received from Mr. Hay, Inspector of the Poor of the City parish, he states that in that parish "the places cleansed by lime-washing and fumigation, were 21 closes, 300 houses, 1060 single rooms, 926 passages, and 1130 flights of stairs. The cleansing was done by a staff of men, at the expense of the Board, recovered in a considerable number of cases from the proprietors." The affected portion of the City parish contains about 20,000 inhabitants, and the amount of lime-washing must appear considerable to any one who knows the structure of the houses. It will be seen that the main preventive measures were directed to the diminishing of the absolute number of epidemic attacks, and this may account for the fact that the deaths reported during the late epidemic were only about one half of those reported during the epidemic of 1832, while in all those towns where equally effective sanitary measures were not adopted, the mortality was very much greater from the late than from the former epidemic.

The following abstract of the Police Returns, from the beginning of the epidemic to the 18th of January, 1849, gives the approximate numbers of attacks and deaths:—

	Cholera Cases.	Deaths.
Edinburgh . .	801	448
Leith . . .	244	86
Newhaven . .	30	20

BRISTOL.—The preventive measures in this city were carried out by the Corporation of the Poor of St. Peter's Hospital, with the co-operation of the other local authorities. At the time the cholera appeared the parochial authorities appointed Mr. Samuel Goldney to act as their medical superintendent, and they proceeded to prepare the worst parts of the town for the epidemic.

In certain parts of Bristol there are notorious fever localities, which were at once dealt with in compliance with the advice of the General Board of Health. A whole street of fever-courts was thoroughly cleansed and lime-washed, so that, on comparing its condition with what it formerly was, the locality could hardly be recognized. All streets requiring constant attention were reported regularly to the proper authorities, and were preserved in a good sanitary condition, so far as the removable causes of disease were concerned. Mr. Goldney reports the results of these measures as follows:—

"The lime-washing operations were continued throughout the whole time of the epidemic, and certainly obtained immunity from attacks of cholera, even in the most notoriously unhealthy districts. Nearly the whole of a large fever-district was washed prior to the appearance of the cholera, and escaped." Mr. Goldney also states that "wherever the disease appeared there were obvious localizing causes, viz., defective drainage, want of water, &c."

From extensive examination I am firmly persuaded that the chief localizing causes of the epidemic in Bristol were connected with the state of the permanent works. The drainage was in many places positively injurious to public health, and the state of the water-supply and privies in the affected localities perhaps worse than I have seen it in most other places.

These special local causes led to sudden and fatal seizures of circumscribed localities, a great number of persons being struck down within a few hours, and a high rate of mortality prevailing.

The medical preventive measures adopted by the guardians were as follows: the city was divided into five districts, with a medical officer to each, and such a number of qualified assistants as might be required to meet emergencies. The medical officers also acted as district visitors. Dispensary relief was freely given. An hospital was opened, of which the medical superintendent took charge, and a suitable staff of nurses provided. During the early part of the epidemic there was unfortunately no house of refuge, and although I urged the absolute necessity of this measure on the Board, there were found to be great local difficulties in obtaining one, from prejudice and the want of consideration of persons who ought to have afforded every facility for the saving of human life. The nature of the localizing causes and the sudden and fatal character

of the attacks rendered the removal of the people absolutely necessary and subsequent experience fully proved that many lives might have been saved had earlier accommodation been obtained. In consequence of the difficulties which had been experienced in this matter, and the great urgency of the case, I deemed it to be my duty to address a written declaration to all the local authorities in the city, calling on them to lend their aid in obtaining suitable premises. The result was, that in a few hours a suitable house was found, and the same night persons were received into it. From this time it was continually in use, and the result is thus stated by Mr. Goldney:—

“The number of inmates in the house of refuge was constantly varying. The largest number in at one time was between 50 and 60. It was visited twice a-day by a medical man, and no cholera occurred. There were occasionally cases of premonitory symptoms, but nothing serious. The total inmates admitted amounted to 210.”

The following striking illustration of the utility of the house of refuge is also given by Mr. Goldney:—

“In a certain lodging-house in Bristol there were 35 attacks of cholera and 33 deaths during the epidemic of 1832. There was then no house of refuge in existence. During the late epidemic a case of cholera occurred in the same house, and I went, and by the aid of the police turned out of it 64 people, 49 of whom were sent to the house of refuge. Out of that number not a single case of cholera took place, but there was a good deal of diarrhœa, which was immediately arrested.”

In addition to the customary district visitation of the medical officers, I recommended the practice, so useful elsewhere, of concentrating the staff on the affected localities, so as to bring as many cases under treatment in the early stage as possible, and Mr. Goldney states, as “the result of these active measures, that a very large number of cases were arrested and prevented from going into cholera, and many lives consequently saved.”

During the whole period of the epidemic a prodigious amount of diarrhœa prevailed in Bristol, but the outbursts of cholera were chiefly confined to well marked, defined, bad localities, and along the banks of the river Frome. This peculiarity of attacking particular spots and leaving the interspaces nearly unaffected, or chiefly suffering from diarrhœa, was strongly marked, and afforded many most instructive illustrations of the truth of the principles of sanitary science.

The amount of premonitory cases of all kinds treated was enormous, as the following general results of the statistics from the 10th of June to the 18th of October will show:—

PREMONITORY CASES.				CHOLERA.		
Dispensary Cases.	Diarrhœa Cases discovered.	Cases approaching to Cholera.	Total Premonitory Cases treated.	New Cases.	Deaths.	Recoveries.
10,477	3,546	717	14,730	789	415	344

The daily statistics are given in Table IX., which also exhibits the peculiarities of the epidemic seizure of Bristol. It will be observed that

the latter is made up of a succession of outbreaks of the disease, which occurred each in a different locality. The effect of the preventive measures is also well marked, by using the “Cases approaching to Cholera” as an index. The plan of relief in these local attacks was, as has been said, to concentrate the medical staff on them; and the proportion of cases arrested by this procedure is shown to have increased after each outbreak, and to have been followed by an immediate diminution of the cases reported as cholera, generally on the same day, which may be accounted for by the practice of reporting the cases every morning for the preceding 24 hours; so that, although the effect appears in the table to have been synchronous with the cause, it might have followed some hours later.

The number of premonitory cases which passed into cholera was exceedingly small; only one or two diarrhœa cases, and about half-a-dozen of those reported as approaching to cholera, having proved fatal. With one solitary, but important exception, to wit, the want of a house of refuge in the early part of the epidemic, the preventive measures were very well carried out in the city of Bristol.

## SECTION V.

### COMPARATIVE RESULTS OF THE TREATMENT OF CHOLERA CASES, AT HOME AND IN HOSPITAL.

THE results of the treatment of cases of cholera in hospital, as compared with those of home-treatment, have fully borne out the statement made in the first notification of the General Board of Health, in regard to the experience of the former epidemic, namely, that “the establishment of cholera hospitals was not successful.” When we consider the wretched, over-crowded dwellings occupied by a great proportion of the parochial cholera patients, and the apparent impossibility of bestowing on them that amount of medical care and assiduous nursing which they so much require; and when we contrast with this the great apparent advantages possessed in hospitals for the treatment of so virulent a disease, we should naturally expect the balance of recoveries to be in favour of the latter. The parochial surgeons had in general every disadvantage to contend with in the home-treatment of cholera, while the patients in hospital were watched over with unremitting care, by night and by day, and every appliance of the healing art brought to bear on their cases. I believe that nothing was left untried which afforded the patients a chance of recovery, and yet the statistical results of the two modes of treatment preponderate greatly in favour of leaving the patient at home.

I select as illustrations the following returns from three cholera hospitals in Glasgow, and four in Liverpool, and place them in contrast with the results obtained by the district surgeons in their home treatment:—