History of the cholera in Manchester, in 1849; as reported to the Registrar General of Births, Deaths, &c; / [John Leigh].

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HISTORY

OF THE

CHOLERA IN MANCHESTER,

IN

1849;

AS REPORTED TO THE REGISTRAR GENERAL
OF BIRTHS, DEATHS, &c.

BY

JOHN LEIGH,
M.R.C.S. OF ENGLAND,

AND

NER GARDINER,
SUPERINTENDANT REGISTRAR OF MANCHESTER.

LONDON:
SIMPKIN, MARSHALL, AND CO.
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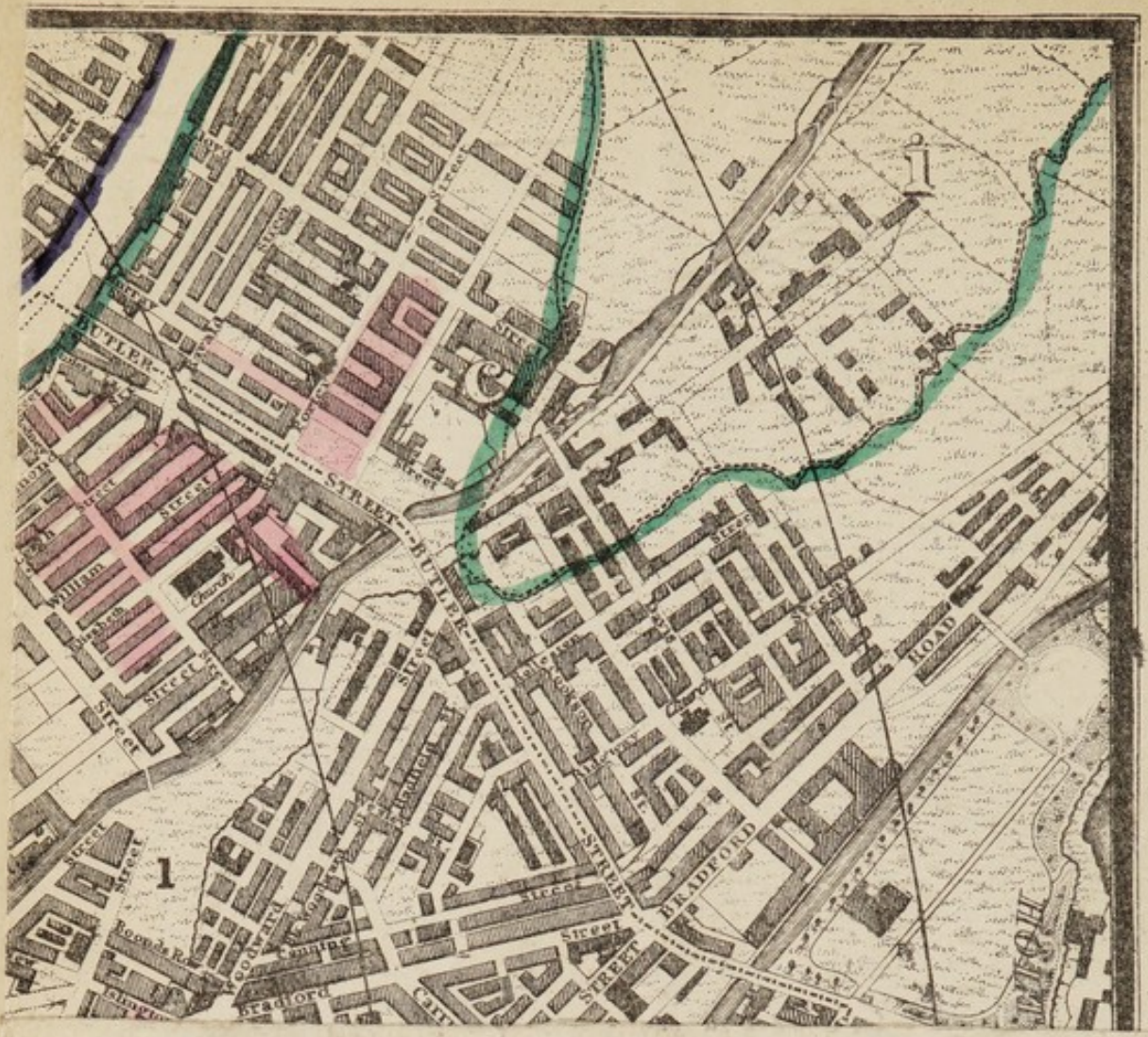
1850.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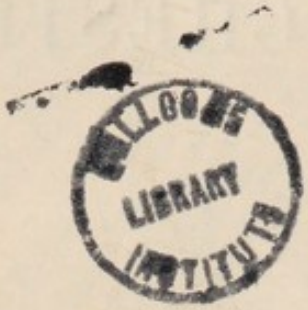

MANCHESTER :
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HISTORY OF THE CHOLERA IN MANCHESTER, IN 1849.

The second advent of Cholera into England is an event which must call forth, in the mind of every reflecting man in it, considerations of the gravest and deepest interest; and it is incumbent on every one to whom opportunities have occurred of observing its progress and phenomena, or of recording its fatal effects, to contribute the sum of his observations, that so, by the united efforts of many minds, the great mystery may at length be solved of the nature and origin, the exciting and predisposing causes, of this fearful pestilence.

Science is made up of many contributions; and individual facts, whose true significance, when isolated, is not perceived, acquire a distinctive character and value when placed in such juxta position that their relation and affinities may be recognized, and their discrepancies noted. The mind that can accumulate cannot always arrange; and as it is the business of one to collect, so it is of another so to dispose and bring into subserviency the vast array before him, that they shall tell the tale of their true meaning, and yield a general expression to their individual and collective tendencies.

By abstraction or accumulation are general laws attained, and the iterations of a single phenomenon may become the general expression of one of nature's constant operations. If, instead of mere guesses concerning what Cholera may possibly be, or may possibly be dependant on, actual investigations were made by men of science concerning what it is, or is dependant on, or even if positive determinations were obtained as to what it is not, there would be a better hope of our arriving at something satisfactory in its history, for every negative fact, by limiting the sphere of inquiry, conducts us nearer to the true path. To discover what a thing is not, is next in value to the discovery of what it is. But unhappily the Baconian system so fertile of discovery in physics, has been all but discarded in physic, and every wandering of the imagination that the non-worker has put forth has been hailed and applauded as the true arcanum sought.

One class attributes Cholera to a want of electricity in the atmosphere; and a periodical, professing to be scientific, gravely advises its readers to wear gutta percha soles, and insulate their beds with glass bottles. Another finds it in the deficiency of ozone, a substance which has never been isolated, and whose function in nature is entirely unknown. A third discovers it in the turbid streams and noisome drains of our crowded cities, whilst the hardy tenant of the far off mountain sinks beneath its fatal breath.

In the passing year, we have seen the bosom of Europe heave with convulsive struggles; men have rushed madly together in political strife; cities have rung with the din of arms; and the dead and the dying have polluted their streets and covered their pavements with gore; whilst the fair fields of Hungary have been watered by the blood of her sons and their foes. But, though thousands have perished, and the widow and fatherless mourn o'er the departed and lament the blood so vainly shed, yet are all these as nothing before the numbers that have fallen by the fell breath of the destroying Spirit of the East.

Regardless of age or sex, unchecked by nation or clime, it visited alike the mansion of the wealthy and proud, and the cottage of the lowly and meek.

On its first invasion, in 1832, the public mind of Europe was roused to an agony of alarm; analogues to its effects were eagerly sought, and caught at, in the vain hope that a conception of its true remedy would follow; and when, at last, exhausted by its own efforts, or having swept off all susceptible of its terrible influence, it left our shores, the minds of men, in calmer mood, traced its course, ascertained where it fell with most deadly effect, and what were the peculiarities in the sites or the people which seemed to foster its stay or invite its progress.

Whatever sunk and enervated the frame, whatever depressed the vital powers, impure air, impure water, deficiency or innutriciency of food, the thousand evils that surround the hapless poor, intemperance, loss of rest, &c. — all these seemed to prepare victims ready for its coming. It passed from among us. The young and ardent feared no return; the grave and matured in years prepared for the contingency, by suggesting alterations and improvements in our sanitary arrangements to mitigate its virulence, which the apathy of the age refused to adopt.

Years rolled by, and, lulled in fatal security, it was fondly hoped the pestilence had left our clime to return no more — for ever. At length a voice went forth that the dread spirit had left its haunts on the Ganges and the Jumna, and quitted the pestilential marshes of the Sunderbund, and was stalking westwards. Alike the hardy and sinewy Tartar on his desert steppes, and the soft and effeminate Persian sunk before it.

It accompanied the mariner to distant shores, and found a home in every land, and Britain again mourns under its fearful visitation.

Independently of the fact, that many, devoting themselves with more time and means to the special study of the progress of the malady, will be prepared to lay down a chart of its general course, this has been rendered almost unnecessary and a matter of affectation, by the masterly exposition of its course and progress published in the *London Times*, and it only remains, with this before them, for observers to mark the peculiarities of its local progress, and by accurately noting such circumstances as have attended its rifest influence and greatest mortality, to endeavour to throw some light on both these, and to elucidate the cause or causes on which it is dependent. In the course of this report, we shall endeavour to show in what localities the disease first made its appearance in Manchester; in what mode or track it spread from those localities; what are the physical conditions and peculiarities of the localities themselves, and the social and moral condition of the inhabitants; in what places the disease has been most fatal, with their conditions; what have been the characteristics of the disease; what the meteorological conditions which have ushered it in and prevailed before its advent, and we shall compare these with the meteorology of similar months in last year; what were the types of disease immediately preceding its invasion; and whether these apparently led to it or tended in its direction, comparing these with the mortality in similar months of last year. A few remarks on the geological position, natural and artificial drainage, with notices of the generally unhealthy districts of Manchester, taken from a pamphlet published some years ago by one of us, may fitly precede a history of the progress of an epidemic within it.

Manchester is situated on the edge of the new red-sandstone formation; the rock on which the town is built is the middle rock of the series, the upper new red-sandstone, or *bunter sandstein*, covered in patches by a thin stratum of red marl *(the keuper)*, which in some parts of England, containing vast beds of salt and gypsum, forms an extensive and very thick deposit. From the outskirts on the north and north-east the sandstone sweeps under the town, and spreads in a wide plain over the neighbouring county of Chester, taking a south and south-westerly direction. To this succeed, having their outcrop on the north-north-east of Manchester, beds of calcareous marls and limestone, the analogue and having the position of the magnesian limestone; below the lower new red-sandstone, the *rothe todte liegende* makes its appearance, a rock very similar, but less conglomerated than the upper, and of great thickness. The rocks, shales, and binds constituting the coal measures now stretch out, and occupy the country to the north-north-east and north-west of the town. The rock immediately underlying Manchester is a coarse conglomerated porous sandstone, of great thickness, in most parts made up chiefly of water-worn fragments of older rocks, coloured by peroxide of iron. From its very loose and porous texture, it admits of a very rapid percolation of water through it.

On the north-west, west, and south-west of the town, the rock

approaches very near to the surface. In the northern parts of the town and the north-eastern, comprising St. George's district, Angel Meadow, &c. and Ancoats districts, and in the central portion, the rock is covered by a detrital deposit of dense compact brick-clay, of variable thickness, but perfectly impervious to water. In the eastern, south-eastern, and part of the south-western portions of the town, comprising part of Ancoats, nearly all Ardwick, Chorlton-upon-Medlock, and Hulme townships, there is a considerable deposit of sand and gravel covering the rock, and an absence of clay. In some places the clay rests immediately on the red rock, but in many parts a layer of sand and gravel intervenes, occupying a different position and different in character from that which forms the soil in the places just mentioned. The rock is found nearest the surface along the tracts adjoining the river-courses, and on the inclined planes leading down those courses, in fact, in the valleys traversed by the Irwell, Irk, and Medlock.

The whole of the densely-populated tract situated between Deansgate, in its whole length, from Cateaton-street to Knott Mill and the river Irwell, is occupied by sand and gravel covering the rock, with an absence of clay.

The same description of soil characterises the small district just below Every-street, Ancoats, and the river Medlock, and is found in the very lowest portion of the valley of the Irk. From this river, however, the land rises rapidly to a great height, and spreads out in a thick bed of strong clay, occupying the centre of Manchester, with the thickly-peopled districts of St. George's and Ancoats, and the crowded ground and streets running from London-road, Chorlton-row, or rather Brook-street, Oxford-street, including Little Ireland. Hence it will be seen that with the small exception above-mentioned, the whole of Manchester is built on a soil which allows of no natural drainage, but that which the inclination of the land affords, or surface drainage.

The adjoining townships of Hulme, Chorlton-upon-Medlock, and Ardwick, are more fortunately situated, being with few and small exceptions founded on gravel. Salford, encompassed on three sides by the Irwell, has its lower sites occupied by gravel, the higher land by clay. An interesting relation is observable between the nature of these deposits and the quality of the spring or pump water obtained on their site.

In the water obtained by sinking wells, when the gravel forms the soil, a quantity of sulphate and carbonate of lime, with muriate of magnesia, has been detected by one of us. The presence of the latter is not generally detected in water procured some distance from Manchester, but always in the water from Deansgate, Strangeways, Hulme, Chorlton-row, and Ardwick. In that of Hulme, carbonate of iron exists, separating as a film of peroxide on exposure to air. These salts give the water the quality of hardness.

The water procured by sinking through the clay, and which is

mostly found in the layer of sand and gravel described as lying between the clay and the rock, is usually softer and freer from magnesian salts. The clay itself is nearly free from calcareous or magnesian carbonates, whilst the gravel of the districts before-mentioned, contains a large quantity of these salts. Hence it is probable that the large quantity of earthy matter the water contains, is owing to its percolation through this deposit. It is owing to the muriate of magnesia present, that the water containing it is so often unfit for manufacturing purposes.

The water of those wells immediately adjacent to burial-grounds situated in gravelly soil is generally somewhat softer. No doubt the ammonia disengaged from the decomposing bodies precipitates the magnesian salts.

The natural drainage of the town is effected on the large scale by the rivers Irwell, Irk, and Medlock; these receive some of the surface water from the inclined lands they traverse, together with the contents of the sewers and a vast quantity of refuse matter, poured into them from different manufactories.

Were the courses of the rivers uninterrupted, the immense quantity of matter with which they are loaded, rendering them black and turbid, would in a great measure be swept on into the country to enrich the agricultural district adjacent to the town, and no time would be afforded for that decomposition which is so injurious to the inhabitants of their particular localities, and the occasional freshes that happen from heavy rains would sweep out anything that might have subsisted during a dry season.

But these streams are dammed up in many places, even in the very town, by weirs thrown across, and behind which matters held in suspension subside to a considerable extent; these decomposing yield putrid emanations of a most offensive character. During the hot days of summer and autumn, bubbles of gas may be seen continually ascending to the surface of the water and bursting, the contained gases being carburetted hydrogen, sulphuretted hydrogen, and carbonic acid. When the water runs freely this is never seen.

It can scarcely be said now that Manchester is a badly sewered town, large wide sewers with the necessary regard to the due inclination have been laid in most of the streets, and the Corporation has been most active in carrying out the sewering and paving of all streets requiring it, whether old or new, and nothing is wanting but a sufficiency of water for flushing. It is hoped that on the completion of the new water-works, sufficient water will be obtained for this purpose.

It is in the courts and alleys and in the condition of house-drains that the greatest deficiencies exist; these are usually left to be drained by the landlord, and are in a most wretched and unwholesome condition. The due inclination to the large drains has not been observed in their construction, and they are scarcely ever cleaned out. The consequence is, that in many well-sewered streets the houses and

courts are in a most offensive condition. It is much to be regretted that the drainage of houses and courts is not also under the direction of the Corporation, The physical features of the ground on which Manchester stands afford great facilities for its natural and artificial drainage. Besides that it is traversed by three valleys through which flow the Irwell, Irk, and Medlock, the surface is exceedingly undulating, and the inclination to the great natural drains by the slopes of the main valleys is sufficient to effect a tolerable surface drainage, were it not that streets and rows of houses cut off the communication between the higher and lower grounds.

From St. George's-road to Every-street, in Ancoats, is a large densely-peopled table land, bounded on the south-west by Swan-street and Great Ancoats-street, where the level is little disturbed, and, being formed of clay, requires great attention to the artificial drainage.

From St. George's-road north-westward the ground slopes to the Irk, and the tract bounded by Miller-street, Swan-street, and Oldham-street, slopes down to the Irk and Irwell. Between Market-street, Mosley-street and Lower Mosley-street, and Albion-street, the included ground inclines gently to the Irwell and Medlock. East of Portland-street the Medlock takes the drainage. So intersected, however, is the land by buildings, that any consideration of surface-drainage is comparatively unimportant.

The artificial drainage of Manchester by sewers has of late years been rendered very complete. In some of the most crowded and ill-conditioned districts the streets have been excellently paved, with attention to their proper inclinations, and artificial drains laid to carry off the surface water; but what is most wanted is a proper communication, with a due inclination to these drains, from the adjacent houses, and the occasional sweeping out of the drains by gushes of water.

From the insufficient inclination of the small sewers, and the want of their being kept freely open, there are a great number of houses to which great nuisances attach.

As it is not intended to present a general report on the sanitary condition of Manchester, it will scarcely be necessary to do more than advert to the grave-yards, slaughter-houses, size-works, skinners' yards, and various manufactories of animal matters, except where they occur in localities in which the Cholera has been particularly rife.

In the examination of the streets and houses of Manchester, it is impossible to avoid the comparison of the wide, airy, clean and dry streets that are found in most parts of Hulme, Chorlton-upon-Medlock, and Ardwick, with the narrow streets, close-winding alleys, and crowded pent-up courts, to be found in many parts of Manchester. The out-townships, again, have the advantage of a dry, gravelly soil, with considerable elevation, whilst Manchester is built on the clay. The houses in the out-townships are of much more recent erection, and built with greater reference or attention to comforts and conveniences.

The number of cellars comparatively is not so great, and they are dry, whilst the great bulk of the inhabitants are of a better class, and, therefore, better provided with the necessaries and comforts of life. The great comparative freedom from the close and loaded atmosphere of Manchester, and the facilities afforded by the nature of the soil, both for surface-drainage and efficient sewerage, and the means afforded for ventilation by the existence of wide, unoccupied areas, must contribute much to the salubrity of these districts.

Though in those parts of Manchester where the streets are formed of the better class of houses, they are sufficiently wide, and their condition well attended to, yet the houses are more crowded together, there are fewer vacant spaces, the means of ventilation are imperfect, both from want of due space and from the dirt and inconvenience attending the too liberal admission of the smoky atmosphere of Manchester; the population is denser, for though an average of the number of inhabitants to each house gives little more than six persons, yet this gives no idea of the density of population. The number of persons to the acre is immensely greater in Manchester than in the out-townships. Thus in Ardwick there are about twenty-one persons to the acre; in Salford, thirty-eight; in Chorlton-upon-Medlock, forty; in Hulme, sixty-one; and in Manchester, one hundred and four persons to the acre.

But though the general condition of the atmosphere and the soil, the crowding and want of ventilation, the density of population, &c. may contribute to the insalubrity of the parts of Manchester now alluded to, yet it is not to these that we are to look for the aggregation of those special causes predisposing to, or productive of, disease, that give to Manchester and some other large towns their general character of unhealthiness. It is in the dirty back streets, the close-crowded, ill-ventilated, damp and badly-drained dwellings that are to be found in every large manufacturing town, that we are to seek them. The chief of these districts in Manchester are, Long Millgate, with the streets and courts running from it and extending from the Cathedral to the top of Ashley-lane; Angel Meadow, a district extending from St. George's-road, or Rochdale-road, to the river Irk, and bounded on the south-east by Miller-street, and on the north-east by Back Ashley-street; Little Ireland, lying on the south-west of Oxford-street; the great mass or block of streets lying between Great Ancoats-street, Oldham-road, Butler-street, and Every-street. The minor districts may comprehend single streets, as Back Hanover-street, Garden-street, Thorneley-brow, Wells-street, and Back-street, with numerous courts all passing off from Shudehill; Back Turner-street and Back Thomas-street, Back Quay-street, Back Hardman-street; the streets between Peter-street and Brazenose-street, and between Peter-street and Great Bridgewater-street off Deansgate; and the streets at Gaythorn lying between the canal and the river Medlock, comprehending Gaythorn, Hewitt, Little Peter, Gilbert-Smith, and Jordan streets, &c. &c.

The township of Manchester is divided into five Registration districts, called respectively the Ancoats, St. George's, Market-street, London-road, and Deansgate districts; and in tracing the track of the Cholera, we shall present, in a tabular form, its progress in each of these districts. The first death recorded from Cholera during this visitation, was that of a young man who died in Redfern-street (Market-street district), June 11th, after a few hours illness. He was a prize-fighter, and had led a very irregular life. On the day of the attack he had returned from Liverpool, from the haunts where Cholera had prevailed, and which place he had visited for purposes of dissipation. No other case occurred till June 26th, when a case was removed to the hospital from Ancoats, and terminated fatally. On June 28th, a person died from Cholera in Mill-street (Ancoats district). On July 1st, the disease made its appearance in Simpson-street (St. George's district), where one death occurred: and on Jnly 2nd, a person died of Cholera in Reather's-yard (Ancoats district). The disease seemed then to slumber for three weeks; no death occurring from it between the 2nd and 22nd of July, except two, reported to have occurred in the hospital, taken from Ancoats, and it will be remarked that all these cases were separated widely from each other. On the 22nd, 23rd, and 28th of July, fatal cases occurred in Gray-street, Every-street, and Blossom-street (Ancoats district); on the 27th, one in Bromley-street (St. George's district); on the 28th, one in Knowsley-street (Market-street district), and one in Heyrod-street (London-road district); on the 29th, one in Hatter's-lane (St. George's district); and on the 31st, one in Balloon-street (Market-street district). On August 2nd, one fatal case occurred in Bennett-street (Ancoats district), and one in School-street (St. George's district). On August 4th, the first case occurred in the Deansgate district, viz: in Rowe's-street, and no further case in this district until August 23rd, when one occurred in Hewitt-street, very closely adjoining the first. On the 7th, 11th, 13th and 14th August, one additional street was affected by single cases in each day specified. On the 15th, the disease occurred in three new streets; on the 18th, in two; on the 21st, in one; and on the 23rd, in four; in one on the 25th, 26th, and 27th; and on the 29th, in seven. By the end of August, the disease was completely established in each of the five districts. For its exact route, see Table No. 1.

The Tables numbered 2, 3, 4, 5, and 6, which exhibited the track of Cholera in each registration-district, as indicated by fatal cases, with the dates and number as they occurred in the several streets from the commencement of the disease to its termination, have been incorporated in Table No, 1.

From June 11th to July 31st, eight fatal cases occurred in the Market-street district; in August, six cases; in September, fifty-six; in October, twelve. In Ancoats district, from June 26th to July 31st, thirteen; in August, thirteen; in September, one hun-

dred and eighty-six; in October, thirty-nine. In St. George's district, from July 1st to July 31st, seven cases; in August, seventeen; in September, fifty-eight; in October, twenty. In London-road district, in July, one; in August, seventeen; in September, one hundred and twenty-four; in October, twenty-two. In Deansgate district, from August 4th to August 31st, sixteen; in September, one hundred and forty; and in October, twenty-nine. Total number of fatal cases in Manchester, eight hundred and fourteen.

The disease invaded Manchester somewhat later than many other towns, and declined with its general decline throughout England. On this account a smaller mortality, compared with the number and condition of the inhabitants, has occurred, than might have been expected. Still it will be seen, by a reference to Table No. 7, that, compared with the general mortality of the quarter, the fatality has been very great. Thus in Ancoats district there died from Cholera, two hundred and ninety; from Diarrhœa, one hundred and sixty; and from all other causes, three hundred and eighty-three. In Deansgate district, from Cholera, one hundred and thirty; from Diarrhœa, ninety-five; and from all other causes, two hundred and twenty-seven: whilst in the whole five districts, out of a total mortality of two thousand five hundred and twenty-five from all causes, one thousand one hundred and fifty-six were from Cholera and Diarrhœa, viz: Cholera, six hundred and sixty-four; Diarrhœa, four hundred and ninety-two; Dysentery, fifty-nine. The total mortality for the like quarter ending September 30th, 1848, from all causes, was one thousand six hundred and seventeen, including the deaths from the usual Diarrhœa and Dysentery. By comparing the mortality in the month of September just passed, with that of the same month in last year, it will be seen that whilst the Cholera actively prevailed here the mortality was very great. Thus in the month of September, 1848, the mortality for all Manchester was four hundred and ninety-five, whilst that for September last was one thousand two hundred and thirty-eight, of which number, five hundred and sixteen are recorded to have been from Cholera, and one hundred and forty-five from Diarrhœa; and we shall presently show that even this large mortality was confined to very limited portions of the town,—to blocks of streets peculiarly situated in regard to population and locality.

The group of streets situated in Angel Meadow (St. George's district,) are built on the declivity between St. George's-road and the river Irk. Some of these run parallel to the inclination, but a great number at right angles to it. The houses are generally of two stories, but occasionally three-storied houses are met with. The cellars, and generally the rooms, are let off to distinct families, consequently there is much overcrowding. The population is almost entirely of the labouring class, and contains a great number of Irish, whose uncleanly habits generally give a character to the district they inhabit. The streets have within very few years been excellently paved and

sewered, but as nearly all the houses were built before this was done, the latter no doubt are very imperfectly drained. Though the streets are sufficiently wide and in excellent repair, yet the dwellings are ill-ventilated, badly drained, very imperfectly supplied with water, much overcrowded,—the inhabitants of many parts in the lowest poverty, pictures of squalor and filth. Tallow-chandleries, pig-styes, and neglected cess-pools are dotted here and there throughout the district. The streets branching out of Shudehill (Market-street district) have long had an evil reputation as the resort of thieves and disreputable characters of all kinds; the streets themselves have lately been paved and sewered, but are exceedingly narrow; the houses let off in single rooms to different families, or occupied as low lodging-houses, overcrowded, ill-ventilated, and ill-drained. The streets and courts passing out of Long Millgate, narrow and confined—the remains of old Manchester,—winding and formed of half-timbered buildings, are well remembered as having been some of the chief seats of Cholera in 1832. In that year some of the courts here were almost entirely depopulated. Bounded on the south-east by the rising ground towards Market-street, Shudehill, and Angel Meadow, and on the north by the river Irk, they might have been healthy enough when the latter was a trout stream, but now running along the margin of that turbid river, loaded with the refuse of every kind of manufacture and decomposing matters, its banks, in many parts of the locality, occupied by skinners' yards, manufactures from offal, bone-size manufactories, one large parish grave-yard, &c. &c., these streets and courts invariably furnish numerous victims to every epidemic that passes over the town. The courts contain cess-pools, slaughter-houses, and in many of them are dressers of tripe, cow-heels, &c. The other group of streets in the London-road registration-district, is characterised by being narrow, having many courts, much overcrowded and ill-ventilated; and is situated on the banks of the Medlock, one of the most polluted and offensive streams in England.

In the Deansgate district, the two localities mentioned as those in which the greatest mortality took place, include the streets, with their courts, situate at Gaythorn, the boundaries of which are, on the south, the river Medlock; on the north, the Rochdale canal—a stagnant and most offensive pool; on the east, the streets are terminated by a bone-size manufactory and skinner's yard; and on the west is the Bridgewater canal and Knott Mill. No situation could possibly be worse or more offensive than this; the streets are narrow and contain many confined courts, the houses are small, and the cellars let off separately. The population is composed of the poorest kind of the labouring class. The district extending from Great Bridgewater-street to Peter-street, is occupied by long rather narrow streets; the houses are of three stories, let off to families in separate rooms; the population is, consequently, very dense; there are many courts, and the house-

drainage is very imperfect. There are particular streets, also, such as Jackson's-row in Deansgate, in which there is scarcely a house in which cases of Cholera, or Choleraic Diarrhœa, have not occurred.

Such is a general description of the localities in which Cholera has been most rife during this visitation. Some of them, such as Gaythorn, Long Millgate, parts of Shudehill and Angel Meadow, as well as the Granby-row quarter, are peculiarly situated, and would seem to possess every circumstance fitting them for the seats of epidemics. The exhalations from the rivers, canals, animal manufactories, &c., are in hot weather most insufferable, and cannot fail to be injurious to health. Yet in nearly all the districts the streets are well paved and sewered, and are regularly swept. The greatest praise is due to the Corporation for the determined and systematic manner in which the paving and sewering of the small back streets in Manchester has been persevered with, and if this alone would make a town sweet, Manchester must have become a healthy and salubrious place; but it is as a smart garment covering squalor and filth.

The regular accession of the disease from its first appearance till the attainment of its maximum, and its subsequent decline till its apparent termination, will be found in Table 9. After the occurrence of a few cases, the disease seemed to radiate in all directions, and to increase with frightful rapidity, till certain changes, to which attention will presently be called, took place, when it again declined almost as rapidly as it had progressed, and finally terminated by the occurrence of distant isolated cases just as it had begun. Happy was it for Manchester that those changes of temperature, &c. took place, which seemed to check its progress, for had it appeared earlier in the season, thousands would have fallen victims when hundreds alone have perished. On comparing the number of deaths at different ages during the last quarter, with the number of like ages during the same quarter of 1848, the amount of increase for each period will be observed. In Table 10, this has been done for each period of five years, and for each registration-district. By adopting this plan for each district separately, some very remarkable irregularities and discrepancies have been made apparent. In comparing the mortality for the whole of Manchester for the quarter ending September, 1849, with that of the same quarter in 1848, it will be seen that the total deaths under five years, are one thousand one hundred and fifty-six to nine hundred and forty-nine; between five years and twenty years, two hundred and eight to one hundred and seventy-four; between twenty years and forty years, three hundred and ninety to one hundred and ninety, or a little more than double; between forty years and fifty years, two hundred and forty to ninety-two, or twice and a half; between fifty years and sixty years, one hundred and ninety-four to fifty-four, or three and a half times; between sixty years and seventy years, one hundred and fifty-nine to fifty-eight, or three times nearly; between seventy and eighty years, one hundred and eight to

sixty-four; the greatest proportion of deaths to the ages then compared with the usual mortality, occurs in people from fifty to seventy years of age.

Whilst this is the general result, yet a glance at the Table itself will show how very unequally and capriciously the deaths have occurred in different districts. Thus in the London-road district, the mortality under twenty years of age was actually less during the last quarter, than in the same quarter of 1848. The subjoined small Table will exhibit these discrepancies: —

District	Age	July, August, September. 1848	July, August, September. 1849	July, August, Sept. 1848. All ages	July, August Sept. 1849. All ages
Ancoats ..	under 20 years	330	450	441	883
St. George's	ditto	163	246	241	417
Marketst ...	ditto	156	177	316	318
London Rd..	ditto	244	234	325	438
Deansgate .	ditto	230	257	294	456

On referring to the localities coloured on the map, we shall find that out of one hundred and eighty-four deaths from Cholera within the Deansgate registration-district, forty-eight have occurred in the small streets bounded by the river Medlock, Deansgate, Great Bridgewater-street, and the Gas-works, sixty-five in the streets lying between Great Bridgewater-street and Peter-street. The small comparative space occupied by these tracts in the registration-district, will be seen by reference to the map. Table 11 exhibits the number of fatal cases of Cholera in each portion of each district, the boundaries being described.

In the Market-street district, out of eighty-five fatal cases, thirty-four occurred in the small streets running out of Long Millgate, and thirty in those out of Shudehill. Out of one hundred and thirty deaths from Cholera in St. George's district, ninety-four occurred in the streets lying between St. George's-road and the river Irk, familiarly known as Angel Meadow. In London-road district, out of the one hundred and sixty-five fatal cases, twenty-six occurred in the small space situated between Granby-row and the river Medlock; thirty-two in that bounded by Granby-row and Shepley-street; and twenty-five in the small streets and courts lying between Port-street and Lees-street. In Ancoats district, sixty-two fatal cases occurred in the streets bounded by Ancoats-street, Oldham-road, Prussia-street and Union-street; fifty-seven between Prussia-street, Oldham-road, Lloyd-street and Canal-street; and sixty-eight in the streets between Great Ancoats-street, Union-street, Butler-street and Mill-street.

On entering the dwellings of the poor, the senses are sickened and oppressed by the fœtid atmosphere within. The walls of the houses are seen to be damp, the odour of the sewers is distinguished, together with the disgusting effluvium produced when many living beings are long thronged together; with such a foul atmosphere vigorous health is utterly incompatible. The paving and sewering of streets

is undoubtedly the first step — the necessary preliminary to the improvement of the sanitary condition of a town — but it is no more; it must not stop there, or very little benefit will follow. The cleansing and draining of courts, the improved drainage of houses, improved means of ventilation, abolition of cellar-habitations, must all be carried out before any great improvement will be perceptible in the sanitary condition of any crowded locality. Much good might be done if ministers of the gospel would more actively assist medical men in exhorting the poor to habits of cleanliness. As it is, medical men and the ministers of one sect of religion are almost left alone to this duty, and the extreme uncleanliness of the poor in their persons, clothes, and dwellings, if not seen, almost passes belief. No doubt, the want of water in sufficient supply is one reason for it, but it is to be hoped that the New Water-works will remedy this portion of the evil.

In Manchester, at all events, whatever may have been observed in other parts of England, it is proveable, then, that Cholera has almost entirely confined its ravages to those localities or particular streets in which noxious exhalations, proceeding from putrifying or otherwise decomposing matters in rivers, canals, stagnant waters, &c. prevail; in which the inhabitants breathe a polluted air, arising from bad drainage, overcrowding, and bad ventilation, whose employment is precarious and not very remunerative, and whose means, therefore, are insufficient to procure a necessary amount of suitable and nutritious food, and whose want of forethought and moral government often leads them to expend a great portion of their scanty earnings in intoxicating drinks rather than in procuring for themselves proper sustenance. Still all these circumstances have existed in all the districts mentioned, during all the years since the last invasion of Cholera. It cannot, therefore, be assumed that any one of them, or all of them associated, have been sufficiently potential for the production of the disease, but that this disease has arisen from something else superadded to all these. This we know, that all the circumstances noted above, individually and collectively, tend to depress the vital powers, to enervate and impair the living frame, and reasonably then, to render it less capable of resisting any agent calculated to set up a train of morbid actions in the system. The body, enfeebled and prone to disease, becomes the ready recipient of a morbific poison, and amongst those in reduced health, we have learned, that Cholera has found nearly all its victims. Amongst such a population as we have described, it must be remembered that the bodily powers become enfeebled or exhausted at a comparatively early period of life. It has been shown in enquiries of former years, that the term of life in these is short compared with the classes above them, and in drawing up the Table of the ages at which death had taken place from Cholera, it was with the expectation of finding that the disease had been most rife and most fatal amongst the enfeebled frames of those past the vigour of manhood. How truly

this was the case, will be seen by a reference to the Table, and to the statements on this subject in a former part of this paper.

If the causes enumerated above were influential in inducing the disease, or fitting subjects for its reception, it seems reasonable to expect that women, whose occupations are more within doors, and at their own homes, than those of the men, should suffer most from it; and this we found to be the case, not in one district only, but in all; the number of females, who have fallen victims to the disease, greatly exceeding that of males. The number of each in the subjoined districts were: —

	MALES.	FEMALES.	
Ancoats	108	143	
St. George's	55	77	
Market-street	35	47	
London-road	69	95	
Deansgate	74	111	
	341	473	Total, 814.

In the progress of the disease there were some remarkable circumstances, indicating an apparent capriciousness in its course, which one of us had peculiar opportunities of observing, as far as regards the Deansgate district. Commencing in Rowe's-street, the complaint gradually spread throughout the group of streets at Gaythorn, and crept up towards Great Bridgewater-street, on the precincts of which it lingered for a time, and then crossed to the narrow street, on the opposite or north side of Great Bridgewater-street; extending amongst these, in some of which it was terribly fatal, it gradually arrived at the borders of Peter-street, another wide street, where it again seemed to be arrested for a time. It then leapt over a considerable space to reach Jackson's Row, where the inhabitants in almost every house were affected. Radiating from this street, it found victims in Bootle-street, Queen-street, &c. In this course the inhabitants of Great Bridgewater and Peter-streets, the only two wide streets that lay in its track entirely escaped. The streets exempted are occupied by respectable shopkeepers, altogether of a different class to the inhabitants of the adjoining streets, and holding little intercourse with them. Separated from the localities above mentioned, by the width of Deansgate, the inhabitants on the west side and in the streets on the west of that great thoroughfare, suffered comparatively little, and such cases as did occur were entirely confined to the narrow streets and courts. In Little Bridgewater-street, a narrow street with cellar habitations, and in which is situated the Town's yard, for the reception of street sweepings, manure, &c. the disease commenced in a family who had removed from Little Peter-street, Gaythorn, in great alarm, from the extreme fatality attending it in this immediate neighbourhood. Two days after their removal two of the family were attacked, and died. The disease then appeared in another house in the street adjacent to the one first visited, the inhabitants of which had rendered little kindly

services to those first affected; the disease then rapidly spread throughout the street.

On the bank of the Medlock, and lying on the south east of Gaythorn, but separated from the latter by the Manchester Gas Works, some large manufactories, and a curve of the river, is the district called Little Ireland. It is occupied almost entirely by the most squalid and indigent Irish immigrants, has numerous pig styes, undrained houses and cellars, a population crammed to suffocation, has the exhalations from the river rolled over it by an opposite high bank, and has long been known to be one of the most unhealthy localities, and in the worst sanitary condition of any in Manchester. In a straight line it is but a few hundred yards, scarcely more than three hundred from Gaythorn, and yet a very few cases of Cholera only have occurred in this locality; indeed but five cases, and four of these happened when the disease was generally declining. Between the Irish immigrants and the English labourer there is but little sympathy and community of feeling, consequently but little spontaneous intercourse, and to this want of intercourse we attribute the almost entire exemption of Little Ireland from the epidemic, whilst to the same cause may be attributed the exemption enjoyed by the wide streets.

We thought that it would be interesting to ascertain whether there had been anything in the general type or character of the disease in the months immediately preceding those in which Cholera made its apppearance, that would appear to indicate a tendency to assume the choleraic character, whether there had been any thing that could be called a premonition of the coming evil; we therefore abstracted the deaths from Diarrhœa, Cholera, and Dysentery, in Manchester, during the months of April, May and June, 1849, and compared them with the number of fatal cases, from the same causes, in similar months of 1848. An inspection of the Table No. 12, will show that whilst the deaths from these causes in the above months, in 1849, were fifty-one, they were in the same period of 1848, fifty four. There was actually a less amount of mortality from such causes, in the months immediately preceding the advent of Cholera, than there had been the year preceding.

To shew how perfectly equal had been the circumstances affecting the mortality in Manchester, even during the first half of the quarters ending September 30th, in the years 1849 and 1848, and therefore up to the very period when the Cholera made its appearance in great intensity, it is only necessary to consult the Table numbered 9, where is exhibited the total number of deaths in Manchester, in each district, during each week, from all causes during the months of April, May, June, July, August and September, 1848–49. It will there be seen that during the first six weeks of the September quarter, the total number of deaths from all causes in 1848, was seven hundred and ninety-three, and in 1849, seven hundred and ninety-nine. The same Table will show that whilst in the fifth and sixth

weeks of September quarter of the present year, the deaths were in each one hundred and thirty-seven; in the seventh week they were one hundred and seventy, and gradually increased to three hundred and twenty-six per week, which was the maximum mortality, and from which they gradually declined. It may be mentioned here that nearly all the first cases of Cholera were fatal. It seems then that the disease appeared here *very suddenly and of great intensity*, without any warning, and without having been preceded by any form of disease, which gradually assumed or seemed to tend towards a choleraic character, a very important point to establish in the history of this disease.

Appended to this report is a Table (No. 13) exhibiting the mean atmospheric pressure, mean maximum and minimum temperature, mean difference between dry and wet bulb thermometer and quantity of rain for each week, from March 30th, to October, 1848, and from April 5th, to October 18th, 1849; and with this is a Table (No. 14) of mortality from Cholera and Diarrhœa, for each week, ending with the same dates, so that any relation that may be supposed to exist between atmospheric conditions and the progress of Cholera may be sought.

It is an opinion held by many, that the progress or continuance of epidemics, is very much dependent on the temperature of the atmosphere, and this opinion is in accordance with observation, and seems to be well founded. It is notorious that many epidemics decline, or are altogether arrested during the winter season, and that they often rage with great violence during the heats of summer. The experiments of the late Dr. Henry tend to prove, that a temperature much below the boiling point of water, is sufficient to destroy contagious matters, but the temperatures within which he supposes this destruction to be effected, are never reached in this country.

That certain diseases, such as Small Pox, Scarlet Fever, &c. are propagated by specific poisons of an organic nature, thrown off by the animal frame, and capable, when received into a living organism, of producing specific trains of symptoms, and of reproducing themselves, is certain; and that these particles of organic matter are capable of being conveyed by the atmosphere as a vehicle, from one individual to another, is equally certain; and that thus diseases existing in one individual may be produced in another, by absorption of matters eliminated from the first, and received by the second, either by direct contact or inhalation. As these matters are capable ef suspension in or of solution by the atmosphere, it is probable that they possess a certain amount of volatility, varying with each poison, and that to their existence in the atmosphere in due quantity to produce their own symptoms in a previously healthy frame, at a certain distance from their source, a particular temperature is necessary, and that under certain reductions of temperature they are not communicable except at within very limited distances from their source.

Certainly the disease, both in the visitation happily just past, and

on its invasion in 1832, declined and ultimately departed from us with the reduction of temperature attending the advancing season. It was even observed, during the late attack in this neighbourhood, that the disease sensibly declined during the prevalence of a cold north wind, although before and subsequently it raged with great fatality. No doubt, a high temperature in ill drained localities would be injurious to health, by raising into vapour and loading the atmosphere with the decomposing and pestilential matters always existing in stagnant sewers, rivers, and canals. A sudden reduction in atmospheric pressure would also injuriously affect the health at such a time as this just past, by allowing a greater quantity than usual of decomposing and particularly gaseous matters to pass into the atmosphere. It is well known that the quantity of any gas that water is capable of retaining in solution, varies with the pressure to which the water and gas are subjected. If the water of sewers, rivers, canals, &c., then, be saturated with a number of gaseous matters when the barometer is high, on a decline in the column a portion of these would escape into the atmosphere, rendering it offensive. It is partly on this account, no doubt, that before rain, sewers and the vicinities of stagnant waters everywhere become exceedingly offensive. We have had occasion very frequently to observe this, both in private houses and in streets.

On comparing the two meteorological tables, however, for the same periods of 1848 and 1849, there is nothing that strikes us as unusual, or in any way remarkable — nothing existing in relation to the atmosphere, which we could say, produced any sensible effect upon it, and therefore no relation, so far as we are able to judge or can legitimately deduce, between any ascertained condition of the atmosphere and the advent or continuance of Cholera. The amount of moisture existing in the atmosphere, or its ratio of saturation as affecting the rate or amount of cutaneous evaporation and pulmonary exhalation, may possibly exercise some influence on the health of the system, but the difference between the actual temperature and the dew point throughout the season, precludes us from attributing to this cause any unhealthiness that has of late prevailed.

Several theories have been put forth respecting the supposed operation of some general cause for the production of Cholera, and to three of these considerable prominence has been given by some daily and weekly publications. One party of observers believe themselves to have discovered the cause in a minute fungus infesting the atmosphere, water, &c., and which having been recognized in the evacuations of Cholera patients, was assumed to have been its potential cause throughout the world. This theory, having received its quietus in the Microscopical Society, need not occupy us. An ingenious and very eloquent gentleman, who is distinguished for his researches on light, suggested that the disease might originate in a deficiency of ozone in the atmosphere. At present we know nothing of the general existence of ozone in the atmosphere at all, and nothing of its

functions in the system of nature, nor do we know that it has existed in less than usual quantities during the past year. Observations on ozone are at present far too limited for us to admit it in explanation of any of the great phænomena of nature. Thirdly; it has been supposed, and the doctrine has met with many advocates and received much notoriety, that Cholera was due to a deficiency of electricity in the atmosphere. This, it is presumed, was merely meant to convey that the atmosphere was in a more than usually negative state; for we know nothing of atmospheric electricity except in its relation to that of the earth, to which it may be positive or negative; or in the relations of different atmospheric strata to each other, certain portions of the air being positive or negative to others, the higher strata being positive to those below them.

The theory of the electric origin of Cholera originated, we believe, in a M. Audrand, who, during the prevalence of the disease in Paris, failed to obtain sparks from his machine on turning round the cylinder or plate (he does not explain which). M. Audrand intuitively perceived a relation between this failure and the existence of Cholera in Paris; and believing himself, as he says, to have been on the eve of a great discovery, in a somewhat grandiloquent letter, immediately communicated his failure to the Academy of Sciences. Now, as the atmosphere must either have been positive to the earth or the earth to the atmosphere, a very simple arrangement must have sufficed to obtain electricity from the one source or the other; and it is difficult to resist the conclusion that there was some such thing as considerable humidity in the atmosphere, which conducted off the electricity as fast as M. Audrand's efforts to obtain it would allow. It preferred to go off in its own natural way, rather than in sparks, which was M. Audrand's way. On the whole, we are disposed to believe that the fault lay with M. Audrand, rather than with the electricity or his machine. As an illustration of the exceeding capriciousness of this agent and of the discordance which sometimes attends the efforts of different investigators, we may state that one of us was daily engaged during the prevalence of Cholera in Manchester, in the analysis of coal-gas, and had daily to use his electrical machine in order to explode the mixed gases with oxygen; singular to relate, the facility in obtaining a charge for a Leyden jar was unusually great, and was presumed to be in some degree related to the dryness of the surrounding medium. In order to ascertain whether there was really anything unusual in the electricity of the atmosphere, we requested Mr. Sturgeon, the well-known electrician, to make a few kite experiments during the time that Cholera was most fatal in Manchester. The experiments were made in the immediate neighbourhood of the town. The apparatus employed consisted of a kite formed of a large silk handkerchief stretched on a square frame-work of wood, to this was connected a strong string, traversed in its whole length by copper wire, and terminating, at its lower extremity, in a silken band, by which the apparatus was insulated; the band was firmly secured to

a stake driven into the ground. Connection was made by a stout copper wire from the string to the prime conductor of an electrical machine placed on the grouud, and insulated, in the usual manner, by a glass pillar. To the prime conductor was affixed an instrument formed of a glass rod, bent at right angles; the horizontal limb was fitted at one end into the prime conductor; the upright limit terminated in a brass cap and ball, the ball being perforated and traversed by a brass rod, terminating also, at each end, in a brass ball. The traversing rod was graduated and could be approximated or removed from the prime conductor, it was also connected with the ground by a copper wire. It constituted, in fact, Lane's discharging electrometer. The application of this latter apparatus was the suggestion of one of us to Mr. Sturgeon, as it was conceived that the striking distance between the prime conductor and the traversing rod, in other words, the thickness of a plate of air which the electricity would pass through, from the prime conductor to the terminal knob of the graduated rod, would measure the tension of the electricity, and the number of discharges in a given time, the quantity, so that comparable experiments could be made.

Several experiments were made, both on fine clear and lightly-cloudy days, and sparks were obtained eight-tenths of an inch long, varying from sixteen to sixty discharges per minute; in the whole of the experiments abundant discharges of electricity were obtained, and we were quite satisfied that there was no deficiency of electricity in the atmosphere of the neighbourhood, whilst Cholera prevailed in Manchester. The electricity on each occasion was determined to be positive, by causing it to traverse a helix within which we placed a fine needle. Mr. Sturgeon, who, for many years, has been almost constantly engaged in experiments on atmospheric electricity, states that he does not recognize anything unusual about it this autumn. That there has been no want of electrical disturbance in the atmosphere, has been proved by the very violent thunderstorm which passed over us during the time of Cholera.

Although we are very much influenced by the amount of light and heat which we receive, and probably by the electrical state of the surrounding medium, being less excited on a damp day than in a dry insulating medium, yet we are not acquainted with any facts that would lead us to believe that a greater or less amount of positive electricity contained in our bodies or the atmosphere which surrounds us, at least, any such change in it as we believe can happen in the present constitution of things, is capable of inducing disease, or in any way affecting our health. This we know, that by placing ourselves on an insulating-stool, we may be brought into a negative condition and remain so for a great length of time without being conscious of any change in ourselves, or experiencing any unpleasant sensation. On the whole it does not appear to us that in the present state of our knowledge, any relation can be traced between the late advent of Cholera and the electrical state of the earth or atmosphere,

before or during its invasion. Putting out of view, then, these three latter, as untenable hypotheses, we have seen that in Manchester, at least, the Cholera has almost exclusively affected the inhabitants of ill-drained, ill-ventilated districts, within or adjacent to which are bodies of excessively foul half-stagnant water, the inhabitants generally being of the most ill-fed class of operatives, and that it affects, especially, the most dissipated amongst them. That amongst the females who are more constantly resident in the localities, the mortality has been greater than amongst the males, whose work more freqnently leads them from home. We know further, that this has been the constant condition of the localities specified, and of the inhabitants themselves, for many years, during which no Cholera made its appearance; and we have also seen, that in a locality in the worst possible condition, in which all the unhealthy circumstances of the affected districts have existed in an aggravated degree, and the inhabitants of which are in the most reduced and wretched condition, the Cholera scarcely existed at all.

Although it is abundantly proved that all the agencies cited above, and whatever else depresses the powers and lowers the tone of the vital system, fits the subject for the reception of Cholera, yet it is equally well proved that these alone are incapable of actually producing the disease, and that the latter is the result of some special cause superadded to all these. This cause, whatever its nature, may be supposed either to emanate from the earth, to exist in and be brought by the atmosphere, or to be generated within the living system itself under the influence of a special cause introduced into the system, finding there materials for its reproduction, as in Small Pox, Scarlet Fever, &c., and being in turn eliminated from the body, affecting the atmosphere and producing the disease in other frames fitted for the reception of the poison. With respect to any emanations from the earth independent of decomposing organic matter, as general agents in the production of disease, we are so entirely ignorant of such, that they cannot reasonably enter into any speculations on the cause of Cholera, or any other epidemic of similar type.

The only instance where this has been attempted with any show of analogy, was, when it was suggested that Epidemic Influenza might possibly be due to large quantities of hydroselenic acid thrown into the atmosphere by volcanic action. It is very well known that a very minute quantity of this gas, when inhaled, will produce symptoms of very severe Influenza, as one of us has experienced. If the poison which produces Cholera has been wafted hither by the atmosphere from a remote distance, it must have existed in the latter medium in one of three conditions, solid, liquid, or gaseous. Had it been solid or liquid particles suspended in the air, its progress would of course have been regulated by the direction of the atmospheric currents, and could not have affected districts swept by a wind from an opposite quarter to that marked by the prior track of the disease.

Now the progress of the Cholera over Europe has been from the east, westwards, having arrived in Europe from the east of Asia; but when the disease made its appearance in Manchester, the wind was not from the quarter whence we might have expected it to have brought the disease; and if the poison existed in this state, it is difficult to suppose it to have been carried over the vast expanse of the Atlantic without either such entire decomposition or dilution as should have rendered the wind harmless on reaching America. We know, however, that the disease has prevailed in America as well as in Europe and Asia. "We have seen," says the writer of an elaborate article in the *Times*, "the pestilential influence ascending the Ganges against the periodical monsoon, and travelling, thus opposed, as rapidly as in other districts during a windless season."

Had the poison been gaseous, then it would have been subject to the laws of gaseous diffusion, and been extended through the bulk of the atmosphere equally in all directions from its original source. The effects of the disease should have appeared then to be radial, and in the progress of its diffusion the inhabitants of every place or country that it reached, *cæteris paribus*, should have been equally affected. This, however, is far from having been the case; we find vast tracts of country between infected districts to have been totally unaffected by the disease. With a direction naturally westwards, so far as we are concerned, the disease having originated in the east, we find that it has followed the most tortuous and often retrograde courses, in order to reach certain destinations. The fancy that the disease has pursued a purely westward course from India is now amply disproved. It is known that from its original sources it has spread eastward to China, and northward to the Himalaya. The track of the disease, as traced on a map of the world, will show that it has followed no particular course or direction, but those of the lines of intercourse or commerce. Often has the disease made its appearance hundreds of miles from an infected district, in a port previously healthy, and decimated the population after the arrival of a ship, having either Cholera on board, or coming from an infected district.

It is natural to infer, if the disease were brought hither by the atmosphere alone, that the poison would arrive first, whether solid, liquid, or gaseous, in a very diluted condition, that it would gradually reach us in a more concentrated state, and at length in such intensity as to produce the fully developed disease: but we should expect that the diluted poison would, in the first instance, manifest itself by slightly affecting the general health; that gradually the public heath would be more disturbed; Diarrhœa of a choleraic character, occasional sickness, and in fact Cholera in a mitigated form set in, and at length the fully formed disease. But all this is contrary to the fact. It is shewn by the tables, that in Manchester at least, up to the middle of last August, there was actually less Diarrhœa of any kind, Dysentery and disease of this type, in fact, up to the very time when Cholera set in, and for the whole three

months previous to its arrival, than had existed up to the same time and during the same period of the year previous (1848).

The first cases of the disease that occurred were marked by extreme virulence and rapid fatality; indeed it was a subject of remark amongst medical men, that in the commencement of the epidemic, the cases were more intense, and less under medical control than subsequently. Those who have seen much of the disease, and it has happened to one of us to be so circumstanced that many cases have come under his observation, will agree that after a certain period the disease underwent considerable changes in its form, mode of attack, and progress; circumstances all sufficiently explicable, on the supposition of its being a poison elaborated within and eliminated from the living system.

As wide streets, airy dwellings, and non-intercourse, have been the constant checks, on a small scale, to its local progress, so the great barriers to its wide dissemination have been lofty ranges of mountains, extended desert steppes, and vast ocean plains.

The last view is that which considers Cholera, apart from its original source, to be a disease communicable from one individual to another, not by mere contact only, but by infecting the atmosphere or clothing, or any medium or media adjacent to, in contact with, or extending to, a certain distance from the affected subject. We do not know at present sufficient of the nature of contagion or infection, accurately to define its laws, but we know that there are certain poisons capable of being eliminated from a diseased frame, which being received into a previously sound one, either by direct introduction, or by inoculation, or by inhalation and various other modes, are capable of exciting within the latter a train of symptoms similar to those existing in the first, and with the production of the same kind of morbific matter, capable of re-exciting the disease in another system, and of reproducing itself. Such are the poisons of Small Pox, Scarlet Fever, Plague, &c. That the disposition to be attacked by these poisons differs greatly amongst mankind, both as regards individuals, states of health, and surrounding circumstances, some individuals possessing apparently a constitutional power of resisting these diseases, others seeming remarkably susceptible of them.

That certain poisons admitted into the system, appear to discover there a *materies morbi*, acting on which, they establish the disease that produced themselves, but which *materies morbi*, once eliminated from the system is not apt to re-form, except under particular circumstances and in particular individuals. Such may be supposed to be the *materies morbi* which aids in the production of Small Pox and Scarlet Fever. Certain systems again seem to contain other materials which lend themselves to the production of certain diseases, as Typhus, Plague, and perhaps Cholera, and are again liable to reproduction within the frame, so that a first attack is no safeguard against a subsequent one. Irrespective of well known mineral and vegetable poisons, we know that there are other poisons, the re-

sult of simple decomposition of dead, previously organized and living matter, which received into a living frame are capable of exciting a most terrible and often fatal train of symptoms, but not communicable in the way of infection; such is the poison received by puncture often, in the examination of the dead human subject, and of the vegetable class that which produces ague.

The first cases of Cholera which appeared in Manchester, or its immediate vicinity, were all ascertained to have been imported cases, one from Glasgow, the others mostly from Liverpool. The earliest cases occurred in people of dissipated habits, or of previous bad health, or reduced by want and privations. The earliest cases in England occurred in sea-port towns, and in many instances, as at Hull, the disease was clearly brought by infected shipping.

The general course of the Cholera in Manchester will be sufficiently indicated by the tables and map; but it lay within the province of one of us particularly to observe its progress, in a particular district, containing about thirty thousand inhabitants—the Deansgate district. Almost entirely confined, for a length of time, to an isolated portion of the district called Gaythorn, a family at length, alarmed by the number of deaths daily taking place around them, removed from thence to another part of the district, and one previously entirely unaffected by the disease. In two days after their removal, two members of this family were seized with the disease; within a day or two more some of their newly-acquired neighbours, who had kindly gone into their house to assist them, were also attacked and perished, and from these the disease gradually spread through the locality into which the first family appeared to have brought it. The question as to whether Cholera is a disease communicable or not, will perhaps be best studied by a careful observation of its local progress, and one of us, from having been a medical officer attending the cases, and having in his capacity of a registrar to record all the fatal cases within his district, had moderately extensive opportunities of investigating its progress. In all cases, enquiries were diligently instituted, as to whether parties affected had been in communication with others who were so, or had been in situations exposing them to the risk of infection, and in most instances it was found that such had been the case, either the disease already prevailed in the locality where the cases arose, or, if in a fresh district, such intercourse had taken place with affected districts, as left no difficulty in accounting for the disease, on the hypothesis of infection. Independently of the instance cited above, where a family removed from Little Peter-street to Bridgewater-street, and appeared to convey the seeds of the disease with them, many others of a similar character occurred. Thus, after the disease had been temporarily arrested by Great Bridgewater-street, it was carried across to Strand-street, by another family from Gaythorn, and then rapidly spread on to Peter-street. The poor seem to congregate together utterly unconscious or regardless of danger.

It was observed, also, that very frequently several persons were attacked successively in the same house, and the subsequent attacks were chiefly of those persons who had been in close attendance on the first cases. In some instances the patients have stated that after having visited those affected, they were seized with faintness and nausea, and some hours afterwards symptoms of Cholera have come on.

After carefully weighing the evidence afforded by the late invasion of Cholera, comparing its general route to and throughout Europe with its progress in particular localities, we are led to the belief that if there exists any evidence of infection at all from any cause, and productive of any disease whatever, that that evidence has been afforded by the progress and phenomena of Cholera.

We believe Cholera to be the result of a specific poison, producing a disease *sui generis*, how originating in the first instance we know no more than of the origin of Small Pox, Scarlatina, and many other minor infections. The objection that medical men and others, attending on or brought into contact with the sick, have not suffered in any great proportion, has but little force; medical men *have* perished from Cholera, and chiefly from amongst those who were in active attendance on the sick. Besides, it has been shown that the disease has chiefly affected persons in previous infirm health, or placed under generally unfavourable sanitary conditions. Medical men do not often die of Scarlet Fever, Typhus, and many infectious diseases, with the sufferers from which they are often brought into contact.

It ought to be remarked, that although the number of fatal cases of *Cholera* registered in the township of Manchester up to October 18th, when the disease had almost entirely disappeared, is 814, yet it has been the custom very much with medical men, when the disease has occurred in children, to certify the deaths as having taken place from Diarrhœa, so that the number of deaths registered from Cholera is actually much below the truth. On inquiry into the character of the Diarrhœa, it has almost always been found to be Choleraic. Indeed it is our opinion, founded on observation, that there has been very little true bilious Diarrhœa, much less than the average amount for the season; and it is to be regretted that so important a point in the history of the disease should have been neglected from any feeling of reluctance; indeed the weekly tables of mortality will more correctly represent the real amount of Cholera in in its various forms than the special tables of Cholera return alone.

The phenomena of Cholera are very remarkable, and strongly distinguished it from every other disease, so much so, that it will never be mistaken or confounded with any other, by those familiarised with its aspect; yet there are two forms under which the symptoms make their appearance and progress, which will be readily recognised by all those who have seen much of the disease.

In the first, the disease commences with Diarrhœa, very often quite painless; this may last with greater or less intensity for

several hours; in some cases Diarrhœa with colourless evacuations exists for a day or two before the symptoms become much marked; in others the Diarrhœa exists for a very brief period before symptoms of collapse come on. The evacuations are at first of the ordinary character, consisting of the contents of the large intestine; very soon, however, these having been removed, the evacuations become entirely watery, colourless, having flocculi or flakes floating of apparently albuminous matter; the discharges, indeed, have the appearance of serum with floating flakes of albumen.

A feeling of nausea follows the Diarrhœa, and presently vomiting takes place, of a colourless serum resembling that discharged from the bowels; great prostration of strength rapidly supervenes; the discharges from the stomach and bowels are in enormous quantity; (in the appartments of the poor it is not uncommon to find the floors covered, to use a common expreasion, almost swimming in fluid;) the voice becomes husky and whispering, the face assumes an anxious, bewildered, ghastly expression; the surface, first of the arms and legs, and subsequently of the whole body, becomes cold, and copiously bedewed with a cold dampness, or rather wetness, which is not perspiration; the pulse is imperceptible, the breath cold and short, the surface of the body of a leaden hue. Cramps, beginning sometimes at the toes and extending to the legs, abdomen, and arms; sometimes beginning at the abdomen and extending to all parts of the body, torture and harass the poor sufferer, who soon dies, apparently exhausted, the senses clear and vigorous to the last.

During the whole course of the disease it will be found that the secretions are suppressed, and a minute enquiry will generally elicit that this has been the case for some time prior to the attack, or rather the development of the more prominent symptoms. There is no urine secreted, no bile, no true perspiration: the discharged matters are not the true secretion of the mucuous membrane, and it is probable that nearly all the other secretions of the body are in like manner arrested. The discharges are exudations, not secretions. The blood is dark, thick, and pitchy or treacly, and the whole frame shrunk to an extreme degree.

The other form of Cholera sets in thus: — The person affected is seized in the first instance with spasmodic pains, commencing generally in the abdomen, but sometimes in the lower extremities, and gradually extending over nearly the whole body. The spasms in a short time become so severe as to cause the patient to cry out loudly, and require his limbs to be rubbed. The countenance assumes a painful and anxious aspect; there is considerable gasping; the pulse, at first quick, becomes exceedingly feeble; the skin pallid and cold, but with scarcely the leaden hue so characteristic of the other form of the disease. The cold perspiration and cold breath occur as in the other form; but very often there is either no vomiting or purging at all, or in a very slight degree. The secretion of urine is suppressed, and, as far as can be judged by the scanty evacuations, that of bile

also. Whilst in the first form of the disease the patients seem to die of exhaustion, in the second form they seem to sink under the excessive spasm, and probably perish directly from spasm of the heart.

We have generally observed that cases of the second form are more rapidly fatal, and less under medical control, than of the first. The system seems to be more thoroughly poisoned.

When all is mysterious and doubtful, it seems almost presumptuous to hypothetise: still, looking at the whole history of the disease, and the grounds on which we are led to regard it as communicable are already stated; seeing how early in its development the secretions are suppressed; that the liver, after the lungs the great emunctory of carbon, ceasing its functions, throws the carbon it should eliminate into the blood; that the blood itself, after a little while, slowly and feebly circulates through the system, and in its tardy transit through the lungs get very imperfectly oxygenized, and therefore still retains its carbon; that the kidneys, whose especial function it is to remove nitrogen from the blood, and cannot, we know, at any time have that function arrested without inevitable and speedy death, ceases also at an early stage of Cholera to remove the *effete* nitrogenous matter from the vital fluid: regarding these circumstances only, without reference to other secretions whose true office is less perfectly known to us, it is difficult to resist the conclusion that some compound, either of cyanogen, or of a more highly complicated and perhaps organized constitution is formed within the system, and acts as a poison to it; the poison itself may be the result of the reception into the system of one of similar constitution. And it is not difficult to conceive, that the wretched Pariahs of India, living on scanty and innutritious food, wallowing in uncleanliness, sleeping after the days' intense heat on the marshy banks of the Ganges and Jumna, may have experienced such a sudden check to the secretions of their already exhausted frames as, under special circumstances with which we are not acquainted, to have produced within themselves a poison which destroyed the vital forces, and in its elimination added thousands to its victims.

In the absence of any specific mode of treatment, the indications offered by the symptoms are, to arrest the vomiting, to check the Diarrhœa, from the enormous extent of which exhaustion rapidly comes on, and the blood becomes inspissated, to endeavour to restore the secretions, and by the outward application of stimulants to maintain the circulation on the surface.

As far as the experience of one of the writers is concerned, the most successful method of treatment, in the first form of the disease, consisted in the exhibition of large doses of opium or morphia, and in some instances of hydrocyanic acid, followed, when the irritability of the stomach had been allayed, by the rapid administration of powerful astringents, such as the compound powder of chalk with catechu and capsicum—or (what the writer has found most powerful as an astringent) the nitrate of alumina, simultaneously with

these latter, calomel in large and often repeated dozes, followed again, when the Diarrhœa was checked, by saline diuretics copiously administered, the surface of the body being at the same time almost covered with mustard or turpentine, but mustard was preferred.

The treatment, whatever it be, must be active; for there is little time for the operation of comparatively inert remedies. The second form of the disease was treated in the same general way, but without the use of astringents.

TABLE I.

The following is the order in which the cases occurred in the several streets, the first case taking place at the date specified, the others, it may be, at various periods:

1849.	Street.	District.	Cases
June 11	Redfern st	Market st	1
26	— —	Ancoats	1
28	Nield st	Ditto	1
July 1	Simpson st	St. George	1
2	Reathers's yard	Ancoats	1
17	Long Millgate	Market st	2
20	Tib st	Ditto	2
22	Gray st	Ancoats	2
23	Every st	Ditto	1
23	Back Crown lane	St. George	1
26	Blossom st	Ancoats	2
26	Gibralter	Market st	9
27	Bromley st	Ancoats	1
27	Angel meadow	St. George	2
28	Knowsley st	Ancoats	1
28	Heyrod st	Ditto	1
29	Hatter's lane	St George	1
29	Blakeley st	Ditto	9
31	Balloon st	Market st	7
31	Crown lane	St. George	5
Augst 2	Bennett st	Ancoats	2
2	School court	St. George	1
4	Rowe st	Deansgate	1
7	Portugal st	Ancoats	4
11	Bloom st	London rd	1
13	Style st and Back do.	St. George	13
13	River st	London rd	4
14	New Murray st	Ancoats	6
15	Holbeck st	London rd	1
15	Back Piccadilly	Ditto	1
17	Portland st	Ditto	2
18	Spear st	Market st	1
18	Boardman st	London rd	4
18	Foulkes' court	Ditto	2
18	Shaw's ct Pump st	Ditto	1
18	Wakefield st	Ditto	1
21	Holgate st	Market st	1
22	Silver st	London rd	3
22	Pitt st	Ditto	4
23	Hall st	Ancoats	3
23	Parker st	St. George	1
23	Hewitt st	Deansgate	4
Aug. 25	Port st	London rd	3
25	Ledger st	St. George	2
26	Miller st	Ditto	1
27	Chamber buildings	Deansgate	1
27	Hardman st	Ditto	2
27	Charter st	St. George	5
29	Little Peter st	Ditto	10
29	Acton st	Londn rd	8
29	Back Acton st	Ditto	
29	Chesterfield st	Ditto	1
29	Dyche st	St. George	2
29	Silk st	Ancoats	3
30	Simpson st	St. George	2
30	1 passage, Buckley st	Ancoats	1
30	Albert's buildings	Ditto	5
30	Wellington court	Ditto	3
30	Rose hill	St. George	1
30	Smith st	Deansgate	3
30	Omega place	Ditto	1
31	Bridgewater st	Ditto	10
31	Lombard st	Ditto	10
Septr 1	Strand st	Ditto	4
1	Strand court	Ditto	
1	Young st	Ditto	1
1	Holme st	Ancoats	2
1	Back Boslam st	Ditto	1
1	Sycamore place	Ditto	2
1	2, Fetter lane	London rd	2
2	Deansgate	Deansgate	5
2	Gregson st	Ditto	4
2	Rose st. Gaythorn	Ditto	1
3	Chambers' buildings	Ditto	1
3	Commercial st	Ditto	7
3	Andrew's court	Ditto	1
3	Harrison st	Ancoats	1
3	Woodward's buildings	Ditto	1
4	Kirby st	Ditto	3
4	Beard's ct. Style st	St. George	1
4	Major st	London rd	3
5	Trumpet st	Deansgate	4
5	Jordan st	Ditto	5
5	Fleet st	Ditto	11

TABLE 1. — *Continued.*

1849.	Street.	District.	Cases
Septr 5	Fairclough's court	Deansgate	1
5	Redford st	Ditto	1
5	Back Newberry st	Ditto	2
5	Back Garden st	Market st	1
5	Back Turner st	Ditto	1
5	Back Thomas st	Ditto	2
5	Ebden st	London rd	1
5	Morville st	Ditto	1
5	Syer's buildings	Ditto	1
5	Commerce st	Ditto	4
5	Broom square	Ditto	4
5	Angel st	St. George	13
5	London road	London rd	1
6	Brown st	Ditto	2
6	Ludgate st	St. George	1
6	Gaylor st	Ditto	1
6	Ledger court	Ditto	1
6	Alport town	Deansgate	2
6	Hall's court	Ditto	1
6	Gartside st	Ditto	2
6	Thornley brow	Market st	2
6	Minshull st	London rd	1
7	Gaythorn st	Deansgate	1
7	Murray st	Ancoats	1
7	Pott st	Ditto	7
7	Back Pott st	Ditto	
7	Higginson st	Ditto	1
7	Horne st	Ditto	1
7	Love lane	Ditto	1
7	Back St. George's rd	St. George	7
7	Marshall st	Ditto	3
7	Bengal st	Ditto	8
7	Sandford st	Ditto	2
7	Ecroyd st	London rd	1
7	Warwick st	Ditto	1
7	Whiteman's buildings	Ditto	3
8	Great Ancoats st	Ditto	1
8	Lever st	Ditto	5
8	Back Lever st	Ditto	
8	Spring gardens	Market st	1
8	Greenwood st	Ditto	1
8	Watson st	Deansgate	2
8	Water st	Ditto	4
8	Cooper's lane	Ditto	3
8	William st	Ditto	1
8	Back Kirby st	Ancoats	1
8	Mellor's court	St. George	2
8	Major st	London rd	1
8	Marsden's court	Ditto	1
8	Brown st	Deansgate	1
9	Michael's place	St. George	1
9	Foundry st	Ditto	1
9	Oldham road	Ditto	4
9	Mill bank	Market st	4
9	Ancoats st	Ditto	1
9	Mather st	London rd	2
9	Aqueduct st	Ditto	1
9	Whittle's croft	Ditto	1
9	Hilton st	Ditto	1
9	Gee's buildings	Ditto	3
9	Elizabeth st	Ancoats	2
9	Henry st	Ditto	8
9	Rowley's buildings	Ditto	1
9	Oldham road	Ditto	1
10	Gerard's ct. Bengal st	Ditto	1
10	Tame st	Ditto	1
10	Back Woodward st	Ditto	1
Sept 10	Leigh st. East	London rd	1
10	Queen st	Deansgte	6
10	Back Queen st	Ditto	
10	Cupid's alley	Ditto	1
10	Gun st	Ancoats	6
11	Fairbottom's court	Ditto	6
11	Austin's court	Deansgate	1
11	St. Andrew st	London rd	3
11	Back Brook st	Ditto	5
11	Canal st	Ancoats	8
11	Lower Canal st	Ditto	
11	Mitchell st	Ditto	1
12	Hewitt's buildings	Ditto	2
12	Tonge st	Ditto	1
12	Copperas st	Market st	3
12	Mount st	Ditto	1
12	Canal st	London rd	1
12	London road	Ditto	3
12	Friday st	Ditto	1
12	Ashworth's court	Ditto	2
12	Tetlow's buildings	Ditto	1
12	Back Nicholas st	St. Georg	8
12	Nicholas st	Ditto	
12	Trafford st	Deansgate	2
12	Newberry st	Ditto	4
12	Barton st	Ditto	2
12	Irwell st	Ditto	4
12	Whitworth's court	Ditto	1
12	Back Coates st	Ancoats	1
12	Back Buckley st	Ditto	1
12	Primrose st	Ditto	8
12	1 ct. Commercial st	Deansgate	1
13	Hanover st	Market st	3
13	Lower Mosley st	Deansgate	2
13	Eltoft st	Ditto	2
13	Tickle st	Ditto	3
13	Welch's court	St. George	1
13	Lydia st	Ditto	1
13	Mason's ct. Major st	London rd	2
13	Long st	Ditto	3
13	Caygill's court	Ditto	3
13	Brierley's court	Ditto	3
13	Lloyd st	Ancoats	3
13	Back Lloyd st	Ditto	
13	Jenny's entry	Ditto	1
13	Singleton st	Ditto	2
13	Stopford's court	Ditto	1
13	German st	Ditto	1
13	Back German st	Ditto	1
13	Rolleston st	Ditto	2
14	Pole st. Pott st	Ditto	1
14	Spinner st	Ditto	6
14	Loom st	Ditto	3
14	Back Clayton st	Ancoats	2
14	Hampson's buildings	Ditto	1
14	Richmond st	Ditto	6
14	New Islington	Ditto	1
14	Coates st	Ditto	2
14	Tib st	Market st	2
14	Brown's court	St. George	4
14	Nelson st	Ditto	1
14	Tebbutt st	Ditto	1
14	New Mount st	Ditto	6
14	New Allen st	Ditto	1
14	Mount st	Deansgte	3
14	Great Mount st	Ditto	
14	Cochrane's court	Ditto	2

TABLE 1. — *Continued.*

1849.	Street.	District.	Cases
Sept 14	Back Dolefield	Deansgate	3
14	Dumvile st	Ditto	1
15	Whalley st	Ancoats	1
15	Aspinall court	Ditto	1
15	East Newton st	Ditto	2
15	Leigh st. East	Ditto	1
15	Mill and Back Mill st.	Ditto	3
15	Knowles' court	St. George	1
15	Bk Turner st & Tame st	Market st	6
15	Edge st	Ditto	6
15	Manchr. workhouse	Ditto	8
15	Albion place	London rd	3
15	Britain st	Ditto	1
15	China lane	Ditto	1
15	Chesterfield st	Ditto	1
15	Chorlton st	Ditto	3
15	Chapman's court	Ditto	1
15	Southern st	Deansgate	3
16	Bradford st	Ancoats	3
16	Peel st	Ditto	1
16	Newton st	Ditto	2
16	Robinson st. East	Ditto	1
16	Bradley st	Ditto	2
16	Camp st	Deansgate	3
16	Buxton	Ditto	1
17	Kinder's court	London rd	3
17	Caroline st	Ancoats	2
17	Marshall's court	St. George	3
18	Crossley's buildings	Ancoats	1
18	Howarth's gates	Market st	1
18	Lomas st	London rd	2
18	Pump & Back Pump st.	Ditto	3
18	Richmond st	Ditto	2
18	1 court, Mount st	Ditto	1
18	Berry st	Ditto	2
18	London court	Ditto	3
18	Travis st and court	Ditto	4
18	1 court, Cooper's row.	Deansgate	1
19	Flag alley	St. George	4
19	Cleminson's buildgs	Market st	1
19	Bond st	Ditto	2
19	Charles st	London rd	1
19	Medlock square	Ditto	5
19	Granby row	Ditto	1
20	George Leigh st	Ancoats	3
20	Butterworth's court	Ditto	1
20	Portland st	London rd	2
20	Lloyd st court	Deansgate	1
20	Wilson's buildings	Ditto	3
21	Cumberland st	Ditto	3
21	Allum st	Ditto	1
21	Duke st	Ditto	6
21	Hadfield st	St. George	1
22	Russel st	Ancoats	1
22	Canning st and place.	Ditto	3
22	Booth's court	Ditto	1
22	Poland st	Ditto	1
22	Wood st	Deansgate	2
22	Clay st	Ditto	3
23	Reather st	St. George	1
23	Union st	Market st	1
23	Paris st	London rd	1
23	Chapel st	Ditto	2
23	Worsley st	Ditto	1
24	Catharine st	Ditto	4
24	Nunn's square	Ditto	1
24	Fort's row	Ditto	2
Sept 24	2 court, Bank st	London rd	1
24	Thompson st	St. George	1
24	Prussia st	Ancoats	1
24	Junction st	Ditto	2
24	Beckett st	Ditto	2
24	Taver's st	Ditto	1
24	Fielding's court	Ditto	1
24	Well st	Market st	5
25	Cross st	St. George	2
26	Spittall st	Ancoats	1
26	William st	Ditto	8
26	Jackson's row	Deansgate	6
27	Taylor's court	Ancoats	2
27	New Allen st	St. George	1
27	Addington st	Ditto	1
27	Anvil st	Ditto	3
27	Garden st	Market st	3
27	Finn's court	Ditto	1
27	Angel tap	Ditto	1
27	Ashton st	London rd	1
28	Heath st	Ancoats	7
28	Jersey st	Ditto	1
28	Fawcett st	Ditto	1
28	Little Green st	St. George	1
29	Pilling's court	Ancoats	2
29	Rodney st and place	Ditto	5
29	Andrew's court	Ditto	2
29	Butler st	Ditto	2
29	Walsh court	St. George	2
29	Railway st	Ditto	1
29	Kerr's court	London rd	1
29	Lomax st	Ditto	1
29	Dyer's lane	Deansgate	1
29	Hamilton place	Ditto	1
Octr. 1	2 passage, Red bank	Market st	1
1	Brighton st	Ditto	3
1	Snowhill	Ditto	1
1	Stott's court	Ditto	2
1	Nicholas croft	Ditto	1
1	Shepley st	London rd	1
1	1 court, Bank st	Ditto	1
1	Ash st	Ancoats	1
2	Collin's court	Ditto	1
2	Limer st	St. George	1
2	Captain's entry	Deansgate	1
3	Mc.Cracken's court	Ancoats	1
3	Back Armitage st	Ditto	1
3	Munday st	Ditto	2
3	Great Ancoats st	Ditto	2
3	Sutton st	Ditto	1
3	Halton st	Ditto	1
3	Burke st	Ditto	2
4	Catharine court	London rd	1
5	Hague's court	Ditto	1
10	Aspden st	Ditto	1
11	Sutcliff st	Ditto	1
11	Nightingale st	Ditto	1
11	Castle st	Deansgate	1
11	Liverpool road	Ditto	1
11	Little Pitt st	Ditto	1
11	Mc.Gee's court	Ancoats	2
11	New Butler st	Ditto	2
11	Isles st	Ditto	1
11	Reid's place	Ditto	2
11	Fairfield st	London rd	1
17	Lee's st	Ditto	1

TABLE 7. — TOWNSHIP OF MANCHESTER.

Particulars relating to mortality in the quarter ending 30th September, 1849.

Disease	Ancoats district	St. George district	Market street district	London road district	Deansgate district	Total	Cholera and Diarrhœa
Cholera	290	73	47	120	134	664	1156
Diarrhœa	160	105	48	84	95	492	
All other causes....	383	239	286	234	227	1369	——
Totals	833	417	381	438	456	2525	——

TABLE 8. — TOWNSHIP OF MANCHESTER.

Particulars as to mortality relating to the calendar month of September, 1849.

Ancoats district		St. George district		Market street district		London road district		Deansgate district		Cholera cases	Diarrhœa cases	Cholera and Diarrhœa
C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	TOTAL.	TOTAL.	TOTAL
216	45	55	35	33	11	97	28	99	26	500	145	645

Deaths for the same period from all causes:

466	186	146	213	227	Total from all causes..1238

TABLE 9. — DEATHS WEEKLY IN THE TOWNSHIP OF MANCHESTER,

In April, May, and June, 1848.

Registration district	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Total
Ancoats	36	34	32	36	24	37	33	31	26	25	23	39	42	418
St. George.....	23	20	23	22	16	22	23	13	19	23	26	32	28	290
Market street....	28	26	18	28	21	31	17	27	26	22	14	22	27	307
London road....	17	16	11	18	22	17	11	19	16	24	15	30	30	246
Deansgate	18	33	15	17	21	23	25	14	12	15	10	23	30	256
Totals	122	129	99	121	104	130	109	104	99	109	88	146	157	1517

DEATHS WEEKLY IN THE TOWNSHIP OF MANCHESTER,

In July, August, and September, 1848.

Registration district	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	One day	Total
Ancoats	30	50	33	31	39	37	22	25	36	36	19	40	33	10	441
St. George..	28	26	19	28	18	17	16	12	17	14	15	11	12	8	241
Market street	29	16	19	22	28	19	39	13	28	20	12	42	25	4	316
London road	28	18	38	32	23	23	19	21	20	22	23	28	19	11	325
Deansgate ..	19	29	20	29	23	22	18	24	19	29	19	20	22	1	294
Totals	134	139	129	142	131	118	114	95	120	121	88	141	111	34	1617

TABLE 9.— *Continued.*

DEATHS WEEKLY IN THE TOWNSHIP OF MANCHESTER,

In April, May, and June, 1849.

Registration district	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	To-tal
Ancoats	40	40	39	39	26	41	36	25	21	27	22	31	44	431
St. George.....	20	22	24	32	22	30	20	25	22	19	19	23	16	294
Market street....	24	22	21	36	17	20	42	15	25	37	22	24	29	334
London road....	22	14	22	20	23	18	23	20	17	28	23	30	25	285
Deansgate	14	17	28	15	14	34	20	19	13	24	30	19	34	281
Totals	120	115	134	142	102	143	141	104	98	135	116	127	148	1625

DEATHS WEEKLY IN THE TOWNSHIP OF MANCHESTER,

In July, August, and September, 1849.

Registrtn. district	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Oct 8	Oct 15	Oct 22
Ancoats ..	26	31	29	72	32	34	48	51	61	67	133	121	118	99	50	36
St.George	15	23	30	21	22	24	37	36	28	38	46	41	51	42	25	21
Market st.	23	18	26	31	32	29	19	30	31	32	42	27	38	25	31	35
Londn rd.	20	18	18	37	25	24	39	24	24	43	52	65	47	43	25	13
Deansgte.	23	17	22	25	26	26	27	32	37	77	53	49	39	38	22	18
Totals ..	107	107	125	186	137	137	170	173	181	257	326	303	293	247	153	123

TABLE 10.— TOWNSHIP OF MANCHESTER,

Deaths at the ages specified for the periods stated.

AGES.	Ancoats' district.		St. George district.		Market-st. district.		London-rd. district.		Deansgate district.	
	April, May, and June.		April, May, and June.		April, May, and June.		April, May, and June.		April, May, and June.	
	1848.	1849.	1848.	1849.	1848.	1849.	1848.	1849.	1848.	1849.
Under 5 years.	226	223	150	164	96	105	98	131	128	153
5 to 10 ,,	34	34	16	23	13	7	21	16	14	9
10 to 15 ,,	11	8	7	4	4	7	8	3	5	5
15 to 20 ,,	18	11	8	7	13	12	4	15	7	5
20 to 30 ,,	22	27	19	17	29	35	21	30	20	19
30 to 40 ,,	28	18	15	13	38	32	28	22	17	19
40 to 50 ,,	21	30	25	18	34	45	19	23	22	27
50 to 60 ,,	22	34	11	22	30	35	12	11	17	18
60 to 70 ,,	17	18	27	14	18	25	18	21	13	11
70 to 80 ,,	13	21	8	9	22	26	14	12	11	10
80 to 90 ,,	6	6	4	3	8	5	3	1	2	5
90 and upwards.	0	1	0	0	2	0	0	0	0	0
Totals.....	418	431	290	294	307	334	316	285	256	281

AGES.	July, Aug. and Sept.		July, Aug. and Sept.		July, Aug. and Sept.		July, Aug. and Sept.		July, Aug, and Sep.	
	1848.	1849.	1848.	1849.	1848.	1849.	1848.	1849.	1848.	1849.
Under 5 years.	282	371	135	213	124	139	203	209	205	224
5 to 10 ,,	28	42	16	22	15	17	25	14	19	14
10 to 15 ,,	10	18	4	8	6	7	8	4	3	9
15 to 20 ,,	10	19	8	3	11	14	8	7	3	10
20 to 30 ,,	22	67	13	30	32	33	25	36	6	28
30 to 40 ,,	19	67	15	30	30	38	13	32	15	29
40 to 50 ,,	18	84	12	33	27	33	17	41	18	49
50 to 60 ,,	24	76	14	29	15	36	8	41	5	47
60 to 70 ,,	14	61	9	19	22	29	5	24	8	26
70 to 80 ,,	11	21	11	25	23	19	12	27	7	16
80 to 90 ,,	3	4	4	5	10	13	0	3	5	3
90 and upwards.	0	3	0	0	1	3	1	0	0	1
Totals.....	441	833	241	417	316	381	325	438	294	456

TABLE 11.— CHOLERA CASES IN SECTIONS,

As marked on Map.

ANCOATS DISTRICT.

Section bounded by Great Ancoats, Oldham Road, Prussia Street, and Union Street .... 62 cases.

TABLE 11. — *Continued.*

Section bounded by Prussia Street, Oldham Road, Lloyd Street, and the Canal ..... 57 cases.
Section bounded by Union Street, Butler Street, Mill Street, and Great Ancoats Street ..... 68 cases.

St. George's District.

Section comprising Angel Meadow ..... 94 cases.

Market Street District.

Section — Streets and Courts about Long Millgate..... 34 cases.
Section — Streets and Courts about Shudehill ..... 30 cases.

London Road District.

Section — Streets between Granby Row and the river Medlock ..... 26 cases.
Section — Streets between Granby Row and Shepley Street ..... 32 cases.
Section — Streets between Port Street and Lever Street ..... 25 cases.

Deansgate District

Section — Streets between the Medlock, Bridgewater Street, and Deansgate ..... 48 cases.
Section — Streets between Bridgewater Street, Peter Street, and Lower Mosley Street ..... 65 cases.

TABLE 12. — MANCHESTER TOWNSHIP.
Cholera and Diarrhœa for the periods stated.

District.	April, May, and June. 1848	April, May, and June, 1849	July, August, and Septbr. 1848	July, August, and Septbr. 1849
Ancoats.				
Cholera	0	4	0	290
Diarrhœa	9	9	75	160
St. George.				
Cholera	1	0	0	73
Diarrhœa	13	11	35	105
Market Street.				
Cholera	0	1	0	53
Diarrhœa	9	9	28	43
London Road ..				
Cholera	0	0	0	125
Diarrhœa	7	8	60	84
Deansgate.				
Cholera	0	0	1	134
Diarrhœa	15	9	65	95

TABLE 13.—METEOROLOGICAL TABLE, 1848.

Week ending.	Mean atmospheric press.	Mean max. temperature.	Mean min. temperature.	Diff.	Dry bulb thermometer	Wet bulb thermometer.	Diff.	Rain.
March 30	29.72	50.71	38.28	12.42	49.57	46.14	3 43	0.71
April 6	29.83	59.71	42.10	17.57	58.10	52.70	5.40	0.18
,, 13	29.42	48.42	34.87	13.57	47.42	44.00	3.42	0.15
,, 20	29.51	53.71	40.86	12.85	52.85	48.00	4.85	0.59
,, 27	29.68	54.57	40.57	14.00	53.30	48.00	5.30	0.16
May 4	29.94	60.71	37.14	23.57	59.28	49.43	9.85	0.06
,, 11	30.01	68.00	44.50	23.50	66.10	55.10	11.00	0.02
,, 18	29.72	70.42	49.83	20.60	68.00	59.00	9.00	0.78
,, 25	30.05	65.80	45.40	20.40	64.00	56.00	7.30	0.08
June 1	29.83	66.00	50.00	16.00	63.00	57.00	6.00	0.70
,, 8	29.43	62.14	45.85	16.20	58.42	53.14	5.28	1.02
,, 15	29.61	63.85	46.70	17.15	60.28	55.57	4.71	2.14
,, 22	29.90	69.50	52.50	17.00	66.70	61.50	5.20	0.97
,, 29	29.63	67.71	53.71	14.00	63.00	59.14	3.86	0.40
July 6	29.76	65.07	48.14	17.43	62.00	55.70	6.29	0.79
,, 13	30.07	70.28	53.80	16.48	67.70	62.80	4.90	1.52
,, 20	29.88	69.00	53.20	15.80	64.80	58.20	6.60	0.43
,, 27	29.61	66.00	50.00	16.00	63.28	59.00	4.28	0.95
August 3	29.40	65.28	52.85	12.43	63.28	57.57	5.71	0.70
,, 10	29.60	63.12	48.42	14.70	61.57	55.42	6.15	1 93
,, 17	29.62	62.85	46.71	16.14	60.85	56.00	4.85	0.53
,, 24	29.62	61.30	46.30	15.00	60.00	55.00	5.00	1.45
,, 31	29.99	64.85	51.71	13.14	63.14	59.14	4.00	0.98
Sept. 7	30.00	65.42	52.85	12.57	62.85	57.57	5.28	0.16
,, 14	29.95	58.00	43.00	15.00	56.00	51.00	5.00	1.48
,, 21	30.08	63.70	43.00	20.70	62.42	56.00	6.32	0.05
,, 28	29.51	63.00	50.00	13.00	62.00	59.00	3.00	1.10

TABLE 13. — *Continued.* —— METEOROLOGICAL TABLE, 1849.

Week ending.	Mean atmospheric press.	Mean max. temperature.	Mean min. temperature.	Diff.	Dry bulb thermometer.	Wet bulb thermometer.	Diff.	Rain.
April 5	29.36	54.00	36.00	18.00	53.00	50.00	3.00	0.51
,, 12	29.48	49.42	37.00	12.42	47.57	44.14	3.43	0.12
,, 19	29.51	46.00	32.00	14.00	43.28	39.71	3.57	0.24
,, 26	29.60	51.00	40.00	11.00	48 00	44.00	4.00	0.47
May 3	29.92	60.00	44.00	16.00	59.00	52.00	7.00	0.10
,, 10	29.62	55.00	42.00	13.00	.....	.....	4.00	.....
,, 17	29.56	60.00	45.00	15.00	.....	.....	5.00	1.49
,, 24	29.48	60.42	49.28	11.14	.....	.....	4.28	1.16
,, 31	29.92	64.00	51.00	13.00	.....	.....	6.00	0.50
June 7	30.09	66.57	50.42	16.15	.....	.....	7.00	0.57
,, 14	29.86	61.10	45.00	16.00	.....	.. ...	5.00	0.08
,, 21	29.09	63.00	49.00	14.00	.....	.....	6.00	0.66
,, 28	29.86	64.85	51.42	13.43	.....	.....	5.71	0.12
July 5	29.81	64.00	52.00	12.00	.....	.....	4.00	1.23
,, 12	30.12	71.28	56.14	15.14	.....	.....	7.28	0.17
,, 19	29.88	68.28	53.57	14.91	.....	.....	6.00	1.01
,, 26	29.60	62.00	50.00	12.00	.....	.....	3.70	2.36
August 2	29.78	63.28	53.85	9.43	.....	.....	4.14	0.31
,, 9	29.82	67.70	55.00	12.70	.....	.....	4.70	0.36
,, 16	29.59	66.57	56.00	10.57	.....	.....	4.00	1.33
,, 23	29.58	63 57	51.42	12.15	.....	.....	4.71	0.49
,, 30	30.19	59.70	45.00	14.17	.....	.....	4.00	0.43
Sept. 6	29.90	68.00	57.00	11.00	.....	.....	5.00	1.51
,, 13	29.62	60.42	47.14	13.28	.....	.....	5.14	1.21
,, 20	30.19	59.70	45 00	14.70	.....	.....	4.10	0.28
,, 27	29.89	62.30	48.70	13.60	.....	.....	5.00	0.47
Oct. 4	29.43	53.28	44.28	9.00	.....	.....	3.00	2.56
,, 11	29.58	50.14	37.28	12.86	.....	.. ...	2.57	1.03
,, 18	29.86	52.00	39.40	12 60	.....	.....	4.00	0.03

TABLE 14. — TOWNSHIP OF MANCHESTER.
(To collate with the Meteorological Table.)

Date 1849	Ancoats district		St. George district		Market strt. district		London rd. district		Deansgate district		Total cases	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
July 5	1	0	1	4	0	1	1	2	0	0	3	7
12	0	2	0	3	0	1	0	3	0	1	0	10
19	0	9	0	9	1	1	0	3	0	3	1	25
26	0	26	2	4	2	6	0	10	0	6	4	52
Aug. 2	0	18	5	5	4	3	1	7	0	12	10	45
9	0	8	2	5	0	5	0	6	1	9	3	33
16	2	11	5	13	0	3	8	9	0	7	15	43
23	6	10	3	14	2	4	5	11	3	13	19	52
30	4	16	6	6	1	1	5	5	10	9	26	37
Sept. 6	17	10	8	8	11	2	20	5	30	10	86	35
13	47	19	21	16	15	8	34	6	44	7	161	56
20	42	11	16	13	16	2	38	7	33	8	145	41
27	45	15	29	8	13	5	29	14	27	6	143	48
Oct. 4	53	11	27	6	13	2	18	2	21	6	132	27
11	23	9	5	1	0	5	10	3	9	5	47	23
18	4	1	3	5	1	7	2	5	7	4	17	22
Totals ..	244	176	133	120	79	56	171	98	185	106	812	556

TABLE 15. — TOWNSHIP OF MANCHESTER.
Deaths at the periods named, with particulars.

District	April, May. and June, 1849	July, Augst. and Septbr. 1849	July, August, and September, 1849.			
			Cholera	Diarrhœa	Dysentry	Other dises.
Ancoats	431	833	290	160	28	355
St. George ..	294	417	73	105	15	224
Market street	334	381	47	48	7	279
London road.	285	438	120	84	7	227
Deansgate ..	281	456	134	95	2	225
Totals	1625	2525	664	492	59	1310
			1215			

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