

Report on the sanitary condition of certain parts of Manchester : being a letter addressed to the committee of the Manchester and Salford Sanitary Association / by A.T.H. Waters.

Contributors

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Sanitary
Manchester
1853-62

R E P O R T

(12)

ON THE

SANITARY CONDITION

OF

CERTAIN PARTS OF MANCHESTER,

BEING

A LETTER

ADDRESSED

TO THE COMMITTEE OF THE MANCHESTER AND
SALFORD SANITARY ASSOCIATION.

BY

A. T. H. WATERS, ESQ., M.R.C.S.,

ACTING SECRETARY OF THE ASSOCIATION.

PUBLISHED BY ORDER OF THE COMMITTEE.

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1853.

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R E P O R T .

TO THE COMMITTEE OF THE MANCHESTER AND
SALFORD SANITARY ASSOCIATION.

GENTLEMEN,

At your request I now proceed to lay before you the result of my investigations, during the past few months, into the condition of some of the districts of Manchester, which I have visited. The report is imperfect, and does not embrace many of the topics which ought to be considered in a sanitary report, such as geological position, drainage, sewerage, &c. Neither does it include the district of Salford, for reasons which have been assigned to you, and inasmuch as I was called upon to draw up the report before I had time to inspect that district.

I have directed my attention to those localities which have been reported on by the different Sub-Committees; and having had the services of the Sanitary officer of the Corporation placed at my disposal by Captain Willis, I have investigated the majority of the cases referred to by them; in addition to this, I have visited some of those localities in the older parts of the city, where the greatest over-crowding and the most need of sanitary improvement exist, some of which had not been inspected by the Local

Committees. My object has been to visit the worst parts of the city, those inhabited by the poorer classes, and to ascertain what are the great evils which there exist; and I have altogether omitted to make mention of those localities which are occupied by the better classes, and which are in a fair and satisfactory condition.

It is scarcely necessary to allude to the fact, that only a false impression of the real internal sanitary condition of any town can be gained by an examination of the broad and open thoroughfares, those with which the majority of the people are acquainted; hence the importance of a careful inspection of the back streets and narrow courts, as regards their external and internal ventilation, over-crowding, state of privies, supply of water, drainage, sewerage, &c. For not only does a want of sanitary regulations in such localities, entail disease and suffering on those who inhabit them, but there is reason to believe, that from their often close proximity to the more wide and open thoroughfares, the seeds of disease may be wafted to those habitations which are otherwise in a satisfactory condition.

The parts of Manchester which I have at various times inspected, include localities in the whole of the Registration Districts, viz: London-road, St. George's, Deansgate, Ancoats, and Market-street; and also in Chorlton and Hulme.

In this report I wish to direct the attention of the Committee to the following general facts, and to illustrate them by examples chosen from the above localities.

1st. The injurious position and condition of batches of houses, and the imperfect external ventilation there must necessarily be, from the manner in which habitations are often constructed; and this not confined to old property, as I shall be enabled presently to show.

2ndly. The over-crowded state of many parts of the City, especially those inhabited by the Irish population.

3rdly. The offensive and overflowing state of the privies, and the very inadequate number which generally exists, to meet the requirements of the population.

4thly. The supply of water.

5thly. The condition of the cellars.

1st. "*The injurious position of batches of houses,*" &c. In the older parts of the city the streets are, for the most part, narrow, and often winding, and but little intersected; thus they do not admit of a free circulation of air, and blocks of buildings are situated close to each other with but little interval between them. But what is worse, the localities abound in courts of which the following may be considered as a common description. They are, for the most part, entered by a narrow arched passage and closed at both ends, often by high buildings; they are but a few yards, and sometimes feet, in breadth; they have houses on both sides varying in number from 1 to 6 and 8 or more. The privies are placed either at the end or ends of the

courts, or else between two of the houses—(this, also, applies to many streets)—and in almost every instance were, when visited, in a filthy and overflowing state. Again, as an instance of the injurious manner in which habitations are built, I would mention that in many parts of the city the houses are built back to back, having a centre wall common to two rows of habitations. Examples of this kind are *very* numerous; often whole streets are built on this principle. It is needless to point out that such an arrangement permits of no perflation of air, and must necessarily be injurious to the health of the inhabitants.

As illustrating the effect of deficient ventilation of streets, &c., in producing an increase of mortality, I would mention the following:—

Mr. Holland, of Chorlton, examined the mortality in eighteen tolerably open streets and in eighteen others exactly like them, except that they were built up at the end, or the ventilation obstructed in some other way, and he found that the open streets gave a mortality for five years of 3·4 per cent. per annum of the population, or 1 in 29·4, while for the same period the deaths in the closed streets were 4·3 per cent. or 1 in 23·2.

As illustrations of the condition of some of the courts, &c., I would mention the following instances:—

Court leading out of Cotton-street, Ancoats.—

This court is entered through an arched passage, at the end of which is a yard about 18 feet square. When visited, this yard was in a dirty state, the sough

for carrying off the refuse water was offensive and acted imperfectly; the court is blocked up by buildings. In one corner are situated the privies, which are quite open, the top seat being removed. They were in a filthy condition, and the stench arising from them was perceptible throughout the yard. There is but one house in this court, containing one room on the ground floor, one on the first floor, and three on the second. The number of people occupying these rooms at the time of visitation was 35, varying in number in each room from four to twelve. The room occupied by the latter number presented an appearance of the greatest misery. The only articles of furniture it contained were a form, a small table, two stools, and a bedstead. In the corners of the room were placed some shavings on which the inhabitants slept at night. Underneath the house are two cellars, in one of which a horse is kept, and in the other a donkey.

Pott-street-court, Ancoats.—This court contains about fifteen houses; it is blocked up at one end, and opens into a narrow street at the other, it is about five yards wide, ill paved, and when visited the surface water was standing in pools. The cellars underneath almost all the houses are inhabited, they are low and small, some of them have back rooms, which are dark, and often damp. The houses are overcrowded, and the inhabitants are a low class of Irish.

M'Kee's-buildings, Oldham-road.—These consist of a batch of houses, some of which open into a court, the remainder into Primrose-street, German-street, and Silk-street. The habitations are built back to back, the centre wall being common both to those opening into the court and into the streets. The habitations opening into the court form an oblong

square, having an entrance through Primrose-street, and one through Silk-street; the latter being a narrow arched passage, close to which are placed the common middens and privies, being in close contiguity to some of the houses. The extremity of the court is blocked up, and privies and middens are placed there; both these and the former ones were in a most disgusting state when visited, and the stench arising from them was fearful. The court was wet from the inefficient state of the sough; the houses dirty both inside and outside, and they presented an aspect of general poverty. Most of the houses have inhabited cellars beneath them, and they are of the worst possible kind. Several of these were examined, and the dimensions taken, as was the case with nine of the houses; the latter consist of two rooms, an upper and a lower, and although visited in the middle of the day, the effluvia^{um} in them was of a most intolerable kind. The inhabitants are a low class of Irish.

In order to show what may be done with even property of this description, I will mention the following instance, which also serves to point out that where expense has been incurred for improvement, the rental is not more than that of similar property in a much inferior condition, and is sufficient to remunerate the owner for making necessary improvements.

Almost adjoining the property above described, viz., M'Kee's-buildings, is another batch of buildings, called Albert's-buildings, which, a few years ago (I am told), was in as bad a state as M'Kee's-buildings. The property fell into the hands of another landlord, who has much improved it; the court is now flagged,

and clean, the cellars and houses above them are much cleaner, and less overcrowded, and are inhabited by a better class of people. The rent, however, is about the same as in M'Kee's-buildings.

Property of a similar kind to that of M'Kee's-buildings, &c., is to be found in many parts of the city, and it is unnecessary to enter into a description of every spot. Gibraltar ; Back Smith-street, Gaythorn, Deansgate ; White-man's-buildings, London-road ; Paradise-court, Hulme, are some of the spots which may be mentioned.

I made a special investigation of the condition of *Little Ireland*, for a purpose which I will presently point out to the Committee.

This locality is situated to the south-west of the Oxford-road, in close contiguity to the large mills belonging to Mr. Birley. It consists of several streets or rows of houses, built on the back-to-back principle. James Leigh-street is the only street in which there are inhabited cellars. These are of a bad kind—having two rooms, one back and the other front. The back rooms have no windows, and light is admitted only by means of the doorway communicating with the front rooms ; they are used as the sleeping apartments, and in some, three and four beds were found, but the number of people occupying each room was by no means so great in proportion to their size as in some other localities.

In some of the streets there is a want of proper drainage, and water stands in them. The privies were generally found in a dirty state. In front of one of the streets are placed some pigsties, but they are not in close contact with the houses.

The railway runs through the locality, and the river Medlock runs at the back of it. Although a confined spot, and surrounded by high buildings, yet some of the streets have open spaces in front of them; and although the overcrowding is great, it is far less than in some other localities I have visited.

Some of the houses are likely to be rendered more unhealthy by an "improvement" which is now being made in Great Marlborough-street. The level of this street has been raised some ten or twelve feet, and the consequence is, that the lower stories of the houses situated close to it are converted into cellars.

I have specially alluded to the state of this locality, for the purpose of endeavouring to explain the cause of the immunity it enjoyed during the last outbreak of cholera. It has been mentioned as a remarkable fact, that but few cases of the disease occurred in Little Ireland, a district said to be in every respect as bad, in a sanitary point of view, as those in which it prevailed to the greatest extent; and the fact has been explained, on the ground that there was but little intercourse between the inhabitants of the infected districts and those of Little Ireland.

I am not aware, from my own experience, what was the condition of this locality in 1849, but I am informed by the Sanitary officer of the Corporation, that it was very similar to that which it now presents; and as the streets are neither so closely packed together, nor is there so much overcrowding as exists in many other parts of the city, and as the inhabiting of cellars is the exception and not the rule, I think the immunity must be in a great measure

attributed to these causes. Moreover, another fact may be mentioned, which may have had some influence in it, viz., that just before the outbreak of the disease, the whole of the houses underwent a process of lime-washing and cleansing, under the direction of the Corporation. The inhabitants of this locality are for the most part Irish, but not entirely so.

As an instance of the injurious manner in which new property is erected, I would mention the following:—

There is a batch of buildings in Rochdale-road, which have a row of houses at their rear, called Jane's-place. The ground on which these houses are built is very sloping, and consequently the front row is raised much above the one behind. They are placed back to back, and between them is a narrow arched passage. The middens open into this passage. The privies are in close contact with the houses, and the effluvia^{um} from them is much complained of by the inhabitants.

This arrangement permits of no ventilation between the backs of the houses; and, moreover, is objectionable on account of the close proximity of the privies.

I would also direct attention to the fact, that, in many of our new streets, too small a space is left at their rear; often a passage a few feet in width is all that exists between the yards at the back of each row of houses.

The second subject to which I have directed attention is
“The overcrowded state of some localities.”

The localities in which I have found the greatest over-

crowding are, the neighbourhood of Angel-meadow, Long-millgate, M'Kee's-buildings, some parts of Ancoats, the neighbourhood of Gaythorn, especially about Back Smith-street, and some other parts of Deansgate; some parts of London-road; in some parts of Hulme, also, there is great overcrowding. In visiting these spots during the day, it is scarcely possible to arrive at the truth as to the number of individuals who occupy the houses; but as I have visited some of the localities during the night as well as the day, I will point out to the Committee the facts which I observed.

On the night of Friday, May 15th, in company with the Sanitary officer, I visited some of the localities in the neighbourhood of Oldham-road and St. George's. The first place visited was *M'Kee's-buildings*, which has been already described, and I there inspected eight cellars and five houses,—and the following is the number of people found in each:—

In Cellar No. 1.—*Five* people were sleeping.

„ No. 2.—*Thirteen* people were sleeping. The dimensions were as follows:—8ft. 6in. by 13ft., and 6ft. 3in. high—giving an allowance of only 53 cubic feet of air to each individual.

„ No. 3.—*Nine* people were sleeping, all on the ground. The dimensions were the same as those of No. 2, and allowing $77\frac{1}{2}$ feet of air to each person.

„ No. 4.—*Eight* people were sleeping, all being on the ground.

In Cellar No. 5.—*Ten* people were sleeping, *seven* being on the ground; *three*, viz., father, mother, and grown-up daughter in one bed, and in another placed on the ground, *five* were sleeping.

„ No. 6.—*Six* people were sleeping, *four* being on the ground.

„ No. 7.—*Six* people were found.

„ No. 8.—*Eight* people were found. Dimensions, 10ft. by 14ft. and 6ft. 3in. high,—allowing 112 cubic feet to each person.

In the five houses which I examined in these buildings, and which consist of two rooms, an upper and a lower, I found as follows:—

In House No. 1.—*Eight* people were sleeping in the room upstairs, and *three* in the one below.

„ No. 2.—*Five* were found upstairs, and *two* below.

„ No. 3.—*Nine* were found in the room upstairs, the dimensions of which were 9ft. 6in. by 9ft. 6in., and 7ft. high, giving an allowance of 70 cubic feet to each individual—and *four* were sleeping in the lower room.

„ No. 4.—*Eight* people were in the upper room, and *six* below.

„ No. 5.—*Fourteen* persons were sleeping in the upstairs room, of which the dimensions were 11ft. 3in. by 12ft., and 6ft. 9in. high, allowing 65ft. of air to each,—and *four* were found below.

In *Ludgate-street* I visited a cellar, the dimensions of which were 17ft. by 18ft., and 6ft. 3in. high. In this room *eighteen* people were sleeping—men, women, and children—some on bedsteads, others on shavings spread on the ground. The size of the room allows of 106 cubic feet to each occupant. This cellar contained the largest number of any I inspected.

In *Style-street* I visited another cellar, in which eleven people were sleeping, the dimensions being 12ft. by 13ft., and 8ft. high, giving an allowance of 113 cubic feet to each person. This was the last cellar visited, about 1 a.m., and the stench on entering it was almost intolerable.

It must be borne in mind that the allowance of air to each individual, as above-mentioned, is made on the supposition of the rooms being empty; but inasmuch as some of them were almost half filled with articles of furniture, bedsteads, &c., that all of them contained more or less of these, and that the individuals themselves occupied a considerable space, the *actual* allowance to each must have been in every instance *considerably less* than that which is mentioned.

Several other houses in the neighbourhood were visited, and in almost every instance the overcrowding was such as to render it absolutely necessary, that the occupants should breathe over and over again air, contaminated by the effluvia from their own bodies; and, moreover, the air of the rooms is not pure when the people retire to rest, for, inasmuch as they are often occupied during the day, and as there is no efficient means of ventilation, the air in them necessarily becomes impure.

The number of cubic feet of air allowed to each prisoner in our gaols, is from 800 to 900, and this constantly renewed by a system of ventilation; and the great immunity they enjoy from fever and epidemic diseases generally, must be considered as in a great measure due to this abundant supply of air. The experience of epidemic diseases points out that, the smallest amount that can be considered compatible with health for each occupant of a sleeping room, is from 400 to 500 feet. The quantity of air consumed during twelve hours, and rendered in a highly poisoned condition, cannot be put down at less than from 120 to 180 cubic feet for each adult. If we compare the amount of air allowed to each person in the cases which I have cited, first of all, with that allowed to prisoners confined in our gaols, we shall find that it is, in the different instances, as 1-16, 1-13, 1-12, 1-11, 1-7, &c.; or, in other words, that in the same space allotted to one prisoner the numbers sleeping were 16, 13, 12, 11, 7, &c.; but the comparison here lamentably fails, for whereas in the prisons there is a system of ventilation, in these houses and cellars there is none.

Again, if we compare it with the lowest amount which appears to be compatible with health for a sleeping apartment, we find that the numbers are 3, 5, 6, and 8, where there should be only one.

The scenes which were witnessed during this nocturnal visit were of the most offensive nature. Some of the rooms were in an extremely filthy condition; in many instances the ceilings were so low as scarcely to admit of the

erect posture; in some of the houses the rooms were filled with dilapidated articles of furniture, and in others there was scarcely even a bedstead, and they presented the appearance of the most abject poverty. In very many instances, water was standing in open vessels in the rooms, and would be used for consumption the following morning.

The occupants of the beds were, for the most part, in a state of nudity, and were huddled together in the same bed, men, women, and children, without any reference to age or sex. Some of them were sleeping on bedsteads, but the majority were on the ground or floor, lying on a few shavings, and having a blanket or counterpane thrown over them. It was no uncommon thing to find four or five lying lengthwise in a bed, and one or two more contrariwise at the foot of the bed. In one house, No. 5, the floor of the upstairs room was literally covered with human beings, and it was almost impossible to take the dimensions of the room without treading on them. In every instance the windows were found closed, and the inlets for air stopped up. In some of the houses the women were found at work, sewing, &c., even at the midnight hour. At the time these visits were made the occupants had not long retired to their beds, but the stench in the rooms was almost intolerable.

I subsequently (on the same night) visited some of the Registered Lodging-houses and found them in a satisfactory condition; and the air of comfort and cleanliness which the rooms presented, was a gratifying contrast to the misery and wretchedness of those I had previously entered. The ma-

jority of the places inspected were of the class of "common lodging-houses," the occupants paying so much per night to the person who rents the house or cellar, as the case may be.

The third subject alluded to is "*The state of the privies, and the inadequate number which exists.*"

In almost every street and court which I have visited, I have found the cesspools and middens in an overflowing condition, and from the dirty habits of the people, the seats of the privies, and the passages leading to them, are covered with offensive matter. The poisonous gases which are given off from these spots, contaminate the surrounding atmosphere, and render it in some cases almost insupportable. It is a very common thing to find privies of this kind immediately under sleeping rooms, and in close proximity to the rooms on the ground floor of the houses on either side of them; and in several of the houses which I have entered, the malaria has been at once perceptible, and is loudly complained of by the inhabitants themselves, and in more than one instance I have found their health evidently suffering from it.

Another evil in connexion with these privies is the inadequate supply to the requirements of the population. It is no uncommon thing to find a whole row of houses, and often a whole street or court, with one, or at most, two sets of privies. The possession of a privy by the inhabitants of each separate house is a luxury I have rarely discovered.

The difficulties which the Town Council have lately experienced in procuring sufficient "horse power" to remove the contents of the middens and cesspools, by which means they have been allowed to become more than usually full, and have been the cause of much complaint on the part of the inhabitants, clearly point out the importance of the adoption of some other method of removal, whereby that enormous amount of labour might be saved.

As examples illustrating the condition of these privies, and the injurious influences likely to be produced by them, I will mention the following cases:—

Pump-street, Rochdale-road—Between two of the houses in this street are some privies in a very dilapidated state; the doors are destroyed, the cross rails alone remain. The privies are quite open, and were, when visited, overflowing, and the floor was covered with offensive matter. Bed rooms are situated over them. The inhabitants of the houses on either side complain much of the offensive smells, especially during wet weather. At the time of visitation there was a perceptible odour in one of the houses, and the health of the woman occupying it was evidently bad. The stench is described as being worse at night.

In Silver-street, St. George's, the privies are in much the same condition, being placed between two houses, and over one set of them is a sleeping room. According to the statement of the Sanitary officer, this is a favourite "habitat" of fever.

Diggles-court, Cable-street.—In this court there are five privies common to sixteen houses; they are in a filthy condition, and the inhabitants of the house

adjoining them complain of the offensive smell arising from them. This house is a notorious spot for fever, and several deaths have taken place in it, from that disease, during the last few years.

Back Simpson-street.—Between two of the houses in this street is a pit which is filled with animal matter and refuse, and is used as a sort of common privy and receptacle for filth.

Flag-alley-court—In a house in this court the fluid from an adjoining privy occasionally soaks through the floor of one of the rooms.

Smith's-court, Back Cotton-street, Ancoats.—The privies in this court are in immediate contact with the houses, and were, when visited, in a filthy condition; the effluvia^{um} was much complained of by the inhabitants.

Back Lad-lane, Deansgate.—The effluvia^{um} from the privies complained of by the inhabitants; over one of them is a sleeping-room.

Back Smith-street, Gaythorn.—The supply of privies is very inadequate, and there is a common cesspool at one end of the street, over which are sleeping-rooms.

In this neighbourhood the supply of privies is very insufficient.

Numerous other instances might be mentioned, both of the injurious position and inadequate supply of these privies, but the above, chosen from several districts, will, probably, be sufficient.

The fourth subject referred to is “*The supply of water.*”

In many parts of the city I have discovered that the water is only “on” during a short portion of the day. The

consequence of this is (that as there are no tanks connected with the houses, in which the water may be stored,) the people are obliged to collect, once a day, a sufficient quantity to last them the 24 hours, and the result is, that this water stands in open vessels in their rooms, and thereby soon becomes loaded with organic matter.

The people appear to be entirely ignorant of the consequences of thus allowing the water to stand in their rooms, and have no conception whatever that it may, by this means, become a source of disease.

Not only is the supply intermittent, but as there is often only one tap for several houses, and perhaps a whole street or court, some of the inhabitants have to carry their water a considerable distance. I need not say that this alone materially tends to diminish the quantity used, both for personal and domestic purposes.

The fifth subject referred to is “ *The condition of the cellars.*”

In all parts of the city, as is well known, cellars exist, and it is in these that the greatest overcrowding and the most abject misery are to be found. The following have been chosen as illustrations, which might be multiplied to any extent:—

On the 9th April, I visited a cellar in *Davis-street, Hulme*, of which the following is a description:—It consists of two rooms; the back room is used as a sleeping room; it is dark, having no window; the floor is of stone, dirty and damp from the drainings

of a privy. The inhabitants complained of the offensive smell perceptible at times. The beds were placed on the damp ground, without any kind of bedstead whatever.

On the 29th April I visited a cellar in *Royton-street, Deansgate*. It consists of two rooms, the dimensions of each of which are about 11ft. by 9ft. and 7ft. high. The front room has a door and a window. The back room communicates with the front, by means of a doorway; it has no window, and neither light nor air enter except through the doorway mentioned. The room is consequently perfectly dark at mid-day. The floor and ceiling are damp. The inhabitants are Irish; they pursue their avocation, that of chopping wood, in the front room during the day, and sleep, to the number of nine, in the back room at night,—and the rent they pay is 1s. 3d. per week.

Instances of cellars of a similar kind might be mentioned, in every district of the city. The majority of them, however, consists of only one room: examples of this kind have been already given in M'Kee's-buildings. In some cases I have found the ceiling of the cellars on a level with the street, but as a general rule they are above it.

It may be said that it is useless to point out the existence of the evils enumerated unless remedies can be suggested. With regard to the first subject, viz., “the construction and arrangement of habitations, &c.,” although those already built cannot be altered, as far as their external arrangement is concerned, much might be done for

them by a proper system of ventilation applied to each house. It is impossible to remove at once all courts and narrow streets, and all dwellings built on the back-to-back principle; but what is, or at least ought to be, in the power of local boards to enforce, is, that no such buildings should be henceforth erected, and that all new streets should have a wide, open space at their rear, and this is especially important under the present system of middens and cesspools. By the adoption of such measures the extension of the evil would be prevented, and gradually the older property would give way, and wide and open streets might be substituted in its place.

With regard to the overcrowding, this is an evil which loudly calls for interference, and the beneficial results which have attended the registration and inspection of lodging-houses, and the limitation of the number of individuals to a given space, point out the great desirability of a more universal extension of the measure. A good deal of property is, however, in such a condition as to render it perfectly unfit for human habitation, and the registration of such places, although it would be attended with present good, would only tend to perpetuate the evil. The erection of Public Lodging-houses on an extensive scale, and in every part of the city, appears to me to be the only means whereby this evil is to be remedied.

All the evidence that has hitherto been collected tends to prove that overcrowding, and consequent deficient supply of air, is the most potent predisposing cause of disease

which exists; and not only does it act as a predisposing cause to epidemic diseases, such as the cholera, but it must also be considered as one of the chief causes of many of those low forms of disease which are witnessed, especially amongst the poor. I would particularly refer to the three following, viz.: *Fever*, *Scrofula*, and *Convulsions in children*.

We know that formerly, when a limited supply of air was allowed to our prisoners, the "gaol fever" was constantly present in our gaols; that on board many of our emigrant vessels, when there has been great overcrowding, numbers have perished from fever, and that the whole of the individuals who survived the black hole at Calcutta suffered from "putrid fever," of which several died. These, and many other facts which might be adduced, are, I think, sufficient to show that whatever other causes of fever there may be, deficient supply of air must be considered as one.

The second disease I have mentioned, which appears to be intimately connected with deficient supply of air, is *scrofula*. It has been found in the case of animals confined in badly ventilated places, that a large proportion sooner or later die of some form of this disease. Cows confined in large towns soon show evidences of it, and it is said that on its occurrence the milk becomes more abundant, and the flesh also softer, and consequently more esteemed.* The tuber-

* Tweedie.

culous or scrofulous deposit, has also been produced in insects, by keeping them in a closely covered uncleansed box.

The following evidence, from Mr. Toynbee, bears also on this subject:—

“The general climate, the cold, the damp, and the soil, were at first accused of the excessive mortality amongst the animals in the Zoological Gardens, but it is now clearly ascertained that it arose principally from defective ventilation. I found that scrofula was by far the greatest cause of their mortality. Since the dens have been properly ventilated, the previous complaints have much diminished.”

It is well known that this disease prevails to a great extent in densely-populated towns, and where there is least attention to sanitary regulations. It is true that there are many agencies at work to produce it, but of the influence of impure air as a cause of the disease, I think most authors are agreed, and the evidence furnished by the facts above-mentioned, with respect to the lower animals, tends to confirm the view; and that the disease prevails to a considerable extent in this city, a few tables which will be found further on will, I think, be sufficient to point out.

Being desirous of ascertaining the proportion of cases of consumption and other forms of scrofulous disease among the patients of the Manchester Workhouse, a short time ago, Mr. Thomas, the surgeon of the establishment, and myself, made an analysis of the cases of all the patients in the wards at one time, with the exception of those in the fever

wards, and out of 317 men, women, and children, we found that 97, or a little less than a third, were suffering either from consumption, in an advanced stage, or some other form of scrofula; and it is probable that, if a more careful examination had been made, other cases of incipient tubercular disease might have been discovered. The following table shows the relative number of cases amongst the men, women, and children:—

Men	120		Scrofulous	47		Consumptive	24
Women	168		ditto	39		ditto	20
Children	29		ditto	11		ditto	1
Total.....	317			97			45

The third disease to which I have alluded as being much connected with deficient supply of air, is *convulsions in children*,—a disease which prevails to a fearful extent in manufacturing towns, and is undoubtedly in a great measure due to the practice which exists of administering opiates to children—but that foul air may also become a cause of the disease, I think the following fact clearly points out:—In the Dublin Lying-in Hospital, in the year 1782, when the ventilation was defective, every sixth child died within nine days after birth, and nineteen-twentieths of the deaths were from convulsive disease. As it was considered that a foul and vitiated air was the cause of the disease, a system of ventilation was established, and the mortality of infants during the five succeeding years was reduced to one in twenty. It remained, however, for Dr. Collins to carry out the principle still further, and for the seven years, ending 1832, during which he was master of the hospital, and when the strictest possible

attention was paid to ventilation and cleanliness, the mortality from this disease averaged 1 in 450 per annum for the whole period, and for the last four years only 1 in 666.

The following Table, from the *Liverpool Health of Towns Advocate*, shows the proportion of deaths from the above-mentioned diseases, to the whole population annually, in the five following towns :—

Diseases.	Birmingham.	Leeds.	London.	Manch.	L'pool.
Fever	1 in 917 ...	1 in 849 ...	1 in 690 ...	1 in 498 ...	1 in 407
Consumption .	1 in 207 ...	1 in 209 ...	1 in 246 ...	1 in 172 ...	1 in 166
Convulsions...	1 in 645 ...	1 in 301 ...	1 in 453 ...	1 in 205 ...	1 in 188

The greater prevalence of the two last-mentioned diseases in Manchester and Liverpool requires no comment.

The following Table shows the number of deaths, as extracted from the Registrar's books for the districts of Ancoats, St. George's, and London-road, Manchester, for the year 1851, from the same diseases.

The total number of deaths in the three districts was : Ancoats, 1,654 ; St. George's, 1,039 ; London-road, 906—making a total of 3,599. Of these, 543, 332, and 274, respectively, giving a total of 1,149, or about one-third, were from fever, convulsions, and consumption, divided as follows :—Fever, 256 ; convulsions, 492 ; consumption, 401. If the deaths from all other forms of scrofula had been included, it is probable that we should have found that nearly half the deaths were due to the three forms of disease to which I have especially directed the attention of the committee, as being much favoured by want of ventilation.

As an instance of overcrowding acting as a predisposing cause to the invasion of cholera, I will quote the following

case from the report of Dr. Sutherland to the General Board of Health, on the epidemic of 1849 :—

In the autumn of that year, a sudden and violent outbreak of cholera occurred in the Workhouse of the town of Taunton, no case of cholera having previously existed, and none subsequently presenting itself among the inhabitants of the town in general, though diarrhœa was prevalent to a considerable extent. The building was altogether badly constructed, and the ventilation deficient; but this was especially the case with the school-rooms, there being only about 68 cubic feet of air for each girl, and even less for the boys. On November 3, one of the inmates was attacked with the disease; in ten minutes from the time of the seizure the sufferer passed into a hopeless state of collapse; within the space of forty-eight hours from the first attack, forty-two cases and nineteen deaths took place; and in the course of one week, sixty of the inmates, or nearly twenty-two per cent. of the entire number, were carried off, while almost every one of the survivors suffered more or less severely from cholera and diarrhœa. Among the fatal cases were those of 25 girls and 9 boys; and the comparative immunity of the latter, notwithstanding the yet more limited dimensions of their schoolroom, affords a remarkable confirmation of the general statement here advanced; for we learn that, though “good and obedient in other respects, they could not be kept from breaking the windows;” so that many of them probably owed their lives to the better ventilation thus established. In the gaol of the same town, in which every prisoner is allowed from 819 to 935 cubic feet of air, and this is constantly being removed by an efficient system of ventilation, there was not the slightest indication of the epidemic influence.

The causes which render the inhalation of air loaded with the products of respiration so dangerous, are not merely that it contains carbonic acid gas—itsself a poison which, in a concentrated state, will destroy life in a few minutes—but that it is also loaded with an animal substance, probably of a “nitrogenous” nature, and apparently in a high state of decomposition, the result of the disintegration of the tissues of the body,—a poison which is eliminated from the blood by the process of respiration, and cannot be with impunity again received into it. Moreover, it has been proved that in proportion to the amount of carbonic acid present in the inspired air, so will the quantity of carbonic acid thrown off and of oxygen absorbed by the lungs, be diminished; and as a free supply of oxygen is essential to the proper oxidation and elimination of the effete matters of the body, through the medium of the blood, it will necessarily follow that, under the influence of an atmosphere which has been respired, not only will carbonic acid be retained in the blood, but other matters also which may be considered to be in a semiputrid state, and which must have a very prejudicial action on the system.

As to the third subject referred to—“The state of the privies and the system of cesspools”—much good may be effected by a more frequent removal of their contents, by a more adequate supply to the requirements of the population, and by a strict supervision of their cleanliness. The whole system, however, requires alteration. The abolition of all cesspools, and the substitution of a system of impermeable sewers, by means of which all the refuse of our crowded

cities might be safely and rapidly carried into the country, and applied to the cultivation of the soil, are urgently called for; and indeed until such is the case—until every man's house shall be furnished with its water-closet, and that contamination of atmosphere which arises from the present system of open privies and cesspools, and the emptying of our sewers into rivers which run through our cities and towns, shall have been done away with, we cannot expect that high standard of health to which we might otherwise attain.

In considering this subject, it is impossible to overlook its importance, not only in a sanitary, but also in an economical point of view. Even if we put aside the question of the value of the refuse of our population as an article of manure, the enormous expenditure which is now incurred in the removal of a large portion of it, by means of hand labour, is one which should force itself on the minds of all economists. But if we look at the subject in its true light—first, as affecting the health of the people; secondly, as to its value as an article of manure; and thirdly, as to economy of removal; it has been proved over and over again, and it appears almost useless to repeat it, that in every respect we should be gainers by the adoption of the system which has been alluded to. It is certainly an extraordinary fact, that in the middle of the 19th century, with all our boasted civilisation and scientific knowledge, we are disregarding the very first principles of animal and vegetable physiology; for, though we admit the truth that, “whilst the plant prepares food for the animal,

the animal throws off food for the plant," yet in practice we ignore it; and at the same time that we send to distant lands for a supply of guano, we are throwing away that which is of equal value, and although in the economy of nature nothing is lost, yet, probably but a very small portion of the refuse which finds its way into our rivers, is taken up by the plants of this country, and directly benefits us.

But it is not simply that we are satisfied with thus wasting the *excreta* of our population, which if unattended with harm might be excusable, but we allow them to pollute the streams which take their course through our densely populated districts, to contaminate the atmosphere which the inhabitants breathe, and to saturate the soil on which our towns stand; by these means we convert into a prolific source of disease that which, if collected and applied to the cultivation of the soil, would stimulate it to a production rivalling that of more genial climates.

The following statement from the Report on the Improvement of Manchester, by Dr. R. Smith, will serve to point out the enormous quantity of valuable matters annually carried off from this city by one river alone:—

"The phosphoric acid at present brought down by the Medlock alone is sufficient to supply 95,000 acres of ordinary wheat crops, 184,000 acres of clover, 258,000 acres of potatoes, or 280,000 acres of oats. The silica in solution in the waters of the Medlock would supply 56,000 acres of wheat, and the other elements would respectively supply a still larger extent of cultivation."

I cannot close these remarks without expressing my thanks to Captain Willis, for his kindness in permitting the Sanitary officer of the Corporation to accompany me in my investigations, and for the attention he has always given to the reports with which I have furnished him.

I would also allude to the fact that at the present time, under the direction of the Sanitary officer, and in pursuance of the orders of the Town Council, the processes of lime washing and cleansing the houses of the poor are being carried on throughout the districts of Manchester, and must undoubtedly be attended with great benefit.

In conclusion, gentlemen, let me add, that, in looking forward, to the future progress of your Association, and the results which may be anticipated from the application of the already known principles of Sanitary Science, to practical purposes, in ameliorating the physical condition of the people, it may be interesting to take a retrospective glance at what has been hitherto accomplished in this country. Not to mention the many local effects which have followed the local application of the principles of drainage, sewerage, ventilation, supply of water, &c., with which the evidence of the last outbreak of cholera abundantly furnishes us, I would confine myself to a few of the grand facts which are now become matters of history. The plague, which devastated European populations, has disappeared from our shores; the ague, the bane of our agricultural districts, has been almost driven from our counties; the scurvy, which formerly swept off thousands and thousands of our seamen, is now scarcely known

in our navy; the “gaol fever,” at other times the terror of our prisoners, no longer decimates the inhabitants of our gaols; an antidote has been discovered for the poison of the small-pox—its ravages have been mitigated; and it only requires that the still lurking ignorance and prejudice of the age should be displaced, in order that it may be expelled from our land. These results have been accomplished by the advance of civilization—by an improved cultivation of the soil—by a better appreciation of the principles of sewerage and drainage—by a greater attention to personal and domestic cleanliness—by the philanthropic labours of a Howard—by the scientific researches of a Jenner; and when we contemplate these effects, we shall not despair that the period may arrive, when, by a further development of that knowledge, which it is the object of your Association to spread throughout the length and breadth of the land, the typhus fever and the scrofula which now swell our tables of mortality, and the cholera, that great epidemic of modern times, will no longer find an “habitat” amongst us.

I have the honour to be, Gentlemen,

Your most obedient servant,

A. T. HOUGHTON WATERS.

June, 1853.