

A different kind of change is found to have taken place in the *lower* division of the township (comprising London Road, Deansgate, and Market-street), this having experienced a *decrease* of population in ten years amounting to 10,804, that is, from 92,176 in 1851, to 81,372 in 1861, diminishing its density by 14 persons to the acre. Yet, notwithstanding this sanitary gain in respect of agglomeration, its death-rate *per births* has decreased only .66 per cent, although, when estimated *per average population*, the change in its favour is greater. The latter result, however, as already intimated, does not always, and especially here, exhibit a faithful representation of the facts.

SANITARY CONDITION OF THE OPERATIVES.

It is popularly believed, especially by those residing at a distance and engaged in other pursuits, that the various employments in cotton manufactories exercise a peculiarly pernicious influence upon the health and bodily growth of those engaged in them; and that the manufacturers who encourage, and increase their wealth by such means must in justice be held accountable for some imaginary but incalculable amount of misery and fatality which their system is the medium of inflicting. There cannot be a fairer opportunity of testing the truthfulness or fallacy of these assertions than is afforded by the results furnished in the tables of the

Registrar-General, bearing on the rate of mortality of the upper and south districts of the town, which contain the dwellings of, at a rough computation, not less than four-fifths of all the factory operatives of the *borough* of Manchester.

This mass of population, amounting to 260,713 persons, is naturally divided by the river Medlock into two groups, one occupying the north-east or right bank, the other the south or left bank of this stream. The two divisions are somewhat differently circumstanced in several respects; but especially in regard to the nature of the soil upon which they are respectively situated, their relative density of population, and the social condition of the inhabitants who occupy them.

The north-east portion of these is the *upper* division of the township already noticed. Its soil is everywhere a dense clay, formerly much used for brickmaking; but the whole district, now crowdedly covered by buildings, is considerably elevated above the river level, and well drained throughout. At least nine-tenths of the houses are small cottage tenements, occupied by operatives. Many of these dwellings, especially such as have been erected within the past few years, are comparatively commodious and healthy, being provided with both front and back doors, by which means a thorough ventilation is secured. Each dwelling is abundantly supplied with excellent water and in some, though by no means in all instances the

household drainage is effectual. Most of them are certainly void of cellarage, the flags or tiles of one or both rooms lying on the soil; but as it is usual to interpose a layer of ashes between the flags and the original soil, it is only now and then that any appearance of dampness is observable. The cellarage occupancy is comparatively limited, care having been taken to rectify this evil, formerly much more prevalent than in the present day.

In this district, the dwellings retain of necessity the old-fashioned appendage which has fallen somewhat into disuse in large towns, namely, the outside ashpit or cesspool, which serves to receive all the ordure and refuse of the household. This "sink of infection," as it has been denominated, is thought by some to be a means of engendering fevers and other pestilential diseases. No greater error could have been committed, or assumption more gratuitous hazarded, implying a misconception of the nature and reactionary processes of the materials they contain. Animal ordure in a healthy state, however exposed, undergoes no change calculated to render it noxious to the health of those subjected to its effluvia. Night-soil men, since they have been persuaded to be temperate, are amongst the healthiest of workmen. It is true, vegetable and animal refuse, the articles chiefly susceptible of noxious transmutation, are thrown into the same receptacle, but these are daily covered by coal ashes from the house fires—one of the most potent as well as the

most plentiful of disinfectants which we possess. In the centre of the town this material is otherwise disposed of, being collected in the early morning at the doors of dwellings and warehouses by the cart of the scavenger, most of the fermentible material, small in individual instances, but cumulatively large, having been already consigned elsewhere.

One circumstance connected with this *upper* division should not be passed over unnoticed. It is this: Although, besides the streets, it contains no open space, either covered or uncovered, for physical recreation; no garden allotments—scarcely a patch of garden ground, and barely a green herb or shrub in its whole extent except those occasionally seen in the cottage windows; no hospital or dispensary, either special or general, whereat appeal for succour might be made in case of accident or other personal exigency; and a population unprecedentedly crowded considering its multitude (104,038), and at the same time so isolated as a class; yet is its death-rate considerably lower, and inferentially its sanitary condition more favourable than that of several of the chief cathedral towns of England, whilst its actual density of population is more than one hundred persons to the acre greater than that of any of them.

The other portion of the quarter containing the dwellings of the factory operatives, comprising the Chorlton townships, occupies the south or left bank of the river Medlock, and partly that of the Irwell, and consists of Hulme, Chorlton-upon-

Medlock, and Ardwick. This quarter contained in 1861, a population of 156,765 persons,* occupying an area of 2,070 acres, which yields a density of 75·70 persons to the acre,—to say nothing of the increased agglomeration caused by the presence of manufactories, which however are fewer in this than in the other districts,—and exhibits a death-rate, per births, of 60·61,†—lower by 4·45 per cent than the general average for England, and lower, estimated per population (2·124), than that of any of the forty county and cathedral towns, except seven of them—Nos. 1, 2, 6, 10, 13, 15, and 30; whilst its acreage occupancy is immensely greater than that of any. The whole of this quarter is flat, but possesses a sufficient fall towards the rivers for effectual drainage. Its soil is light and porous in at least five-sixths of its extent, being chiefly sandy in the Ardwick township, and gravelly elsewhere, with patches of clay towards its southern confines. The tenements, generally more modern than those of the St. George-Ancoats district, are in the main commodious and comfortable, their supply of water and household drainage good, and the streets wider; and there exist also several large open spaces which serve doubtless to improve the salubrity of the atmosphere. This district contains, moreover, a considerable number of detached establishments, the residences of private

* Gorton (estimated at 7,000 inhabitants) and Didsbury being excluded.

† This number includes the fatalities in the Union Workhouse for the five years ended 1855.

families, as well also as a still greater number of less pretentious but excellent houses, sufficiently commodious as dwellings for families of ample means. The proximity of this wealthier class has here, as similar comminglings of social elements have elsewhere, the effect of visibly improving the moral tone of the populace, and of augmenting their material comforts.

It is but an act of justice towards an important class of the community to notice in passing, that although usually residing at considerable distances from their manufacturing establishments, the principals of these concerns are far from being unmindful of the means necessary to the moral and intellectual culture of their workpeople. In many instances, educational institutions, founded and supported by the owners of these establishments, are attached to the large manufactories, and not seldom enjoy the supervision, either of the principal himself, or of members of his family or firm. In one part of the district under consideration, and formerly perhaps the worst locality within its precincts, several considerable streets of poor insalubrious tenements have been entirely removed to afford space for the erection of an extensive and elegant place of worship (episcopal), with commodious schools, reading-rooms, &c., and provided with a well-disciplined staff of teachers. Another similarly endowed establishment, equally commodious and complete, has been planted in a

quarter a little distant from the first-named; and a third is in process of erection,—all within the same township, and done at the expense of one firm, the principals of which are members of one and the same family. The amount of outlay necessitated by these highly praiseworthy undertakings must be very considerable. In efforts to further the objects of these institutions, one of the principals has for years past spent, and does continue to devote the whole of his leisure time, always to the abridgement of his own personal comforts, though probably not always without prejudice to health.

The tenements of the operatives in the south (the Chorlton), like those of the north-east or *upper* (the St. George-Ancoats) quarter, already spoken of, are provided with the outside ashpit or cesspool, the inside water-closet being found in the larger dwellings only.

These two quarters numbered in 1861, as before stated, a population of 260,713 persons, four-fifths at least of whom are families who earn their livelihood in the cotton manufactories, warehouses, machine-works, iron and glass foundries, and other collateral and associated branches of industry. A considerable number of the town shopkeepers also, whose places of business, like the warehouses, are deserted at night, have residences in the Chorlton quarter.

The whole space occupied by this mass of 260,713 inhabitants amounts to 2,770 acres, giving a density

of 94·12 persons to the acre; and the average death-rate per births for the ten years ended 1860 was 65·83. This rate of mortality is ·77 per cent above the national average; but when compared with that of other populations of towns usually deemed healthy, the disparity, though variable, is mostly in its favour. For instance, it is lower *per births* than that of any of the forty county and cathedral towns mentioned, with the exception of five only, namely, Oakham, Derby, Huntingdon, Bedford, and Appleby. Estimated *per population*, its death-rate—2·401 per cent—is lower than that of twenty-two of the county and cathedral towns, though higher by ·198 per cent than the average of the remaining eighteen.

But some allowance may, not unreasonably, be claimed for this combined operative district on the score of dimensions and density; for, while its population is more than 230,000 in excess of the average for each of the said eighteen towns, its rate of occupancy is ninety persons to the acre greater.*

As already stated, the death-rate for the *lower*—the central district of Manchester—was, per births 90·22, and per population 3·232 per cent per annum;

* The towns alluded to are Nos. 1, 2, 3, 4, 5, 6, 9, 10, 13, 15, 16, 17, 19, 27, 29, 30, 32, and 36 in the table. Their aggregate population is 550,713, yielding an average of 30,595 for each town; and the space which they collectively occupy is 163,234 acres, being at the rate of 3·37 persons to the acre. The correlative items for the combined operative district are given in the text.

being 17·65 by the first process, and ·212 by the second, higher than that of the *upper* district. It may be enquired: To what agency or combination of conditions is this excessive mortality owing? It cannot be due to the presence of factory operatives, even were it not already proved that factory employment has not the pernicious tendency commonly assigned to it; for this quarter contains not above one-fifth of them. The greatest number of this supposed one-fifth are found within the precincts of London Road, that of Deansgate having a still smaller proportion. The Market-street district contains but a very minute proportion of this class. Its multitudes of shops (besides warehouses) and its extensive markets, employ the great bulk of its resident poor; but it has also a large strolling, migratory, and vagrant population.

In the production of this higher death-rate many agencies are doubtless concerned, amongst which agglomeration has a share, though perhaps not the principal one; for it has been shown that the districts which are the most densely crowded are more favourably conditioned than those which are less crowded. Neither can it in any great measure be due to the existence of outside cesspools; for in the same, the higher and more healthy quarters, every house is provided with one of these appendages; while in the lower parts, the warehouses, shops, hotels, and respectable private dwellings are furnished with the inside

watercloset; the cesspool receiving chiefly the kitchen refuse, which is daily covered and rendered innocuous by coal ashes.

The greatest amount of disease of almost every kind, and the cases which prove the most intractable under treatment, are ever associated with personal uncleanness, indolent and unthrifty management, household squalor, organic putrescency, crowded sleeping rooms, the obstinate exclusion of fresh air, cramped, ill-ventilated, badly-regulated workshops, or intemperate habits. These, and a few kindred moral depravities to be met with in every household, doubtless stand foremost among the agents of insalubrity everywhere. Under certain degrees of aggravation and continued operation, they inflict their maleficence as effectively within the isolated mansion, the tenements of the scattered hamlet, the ship at sea, as in the crowded city.

Sewage fermentation plays also its part, and doubtless an important one. In districts having a high situation above the river level, the influence of this agent is less felt; but in situations where the drains become large, and wherever the current is sluggish, the more solid materials are liable to lodge, especially in dry seasons, sufficiently long to putrefy and emit gaseous products, which are extremely noxious as well as offensive. These poisonous effluvia regurgitate along the drains and escape upwards through the first imperfectly-valved grids arrived at, mixing with the surface

stratum of the ozoneless air, already charged with mephitic exhalations from other sources, and unavoidably producing effects more or less prejudicial to the health of those respiring the vitiated compound.

The quarter of the town under consideration, namely, the lower and more central part of Manchester, occupies a gently sloping tract of land, bounded, on three sides, by the rivers Irwell, Irk, and Medlock, with two smaller streams—the river Tib and Shooter's brook—running in nearly parallel course along the slope between the Irk and Medlock, both terminating in the last-named. But the large sewers empty their loads of refuse into the three principal currents, which are further tainted by waste matters poured into them from dye-houses, chemical manufactories, chandleries, &c.; and it is to these agents more especially that a weighty measure of evil is commonly attributed.

Now, it is seriously questionable if these contaminating admixtures have any real share in rendering either the streams or surrounding atmosphere less salubrious than they would be without them. With the drain refuse disposed of as it is, I am inclined to think otherwise. So far as I have been able to learn during a quarter century's experience in the centre of these localities, typhus and other forms of disease commonly attributable to mephitism, are not more prevalent near the banks of the large streams than they are found to be

elsewhere: even the greater prevalence of typhus in towns generally, with streams thus tainted, than in those with limpid currents, is highly problematical.* Unquestionably, both the appearance and the exhalations emitted from the rivers and some of the canals are sufficiently objectionable; but any deleterious effect which these are likely to produce upon physical health is more justly referrible to that portion of the drain matters furnished from sinks and waterclosets, and not to those which impart to the water its dark colour and sometimes peculiar odour.† Such inference would seem to be countenanced at least by this evidence: The liquid refuse issuing from dyehouses and other such places of industry consists largely, if not chiefly, of the products of coal-tar, tan, neutral salts—such as chlorides of lime, alum, iron, and of other basic bodies—articles which chemists especially recommend, under sanction of Government patent, as valuable disinfectants. They cannot, therefore, according to accepted theories, be deleterious to health. Indeed, should an efficient system of drainage be effected, such as that now contemplated for Salford, it might not be unwise to make arrangements for a diversion of these chemical waste waters into the main drain current, both as a means of assisting the flushing process and of deodorisation.

* See note on Deaths from Typhus at the end.

† The word *peculiar* is here used in contradistinction to putrescent or noisome.

Moreover: The operatives employed in dye-houses, chemical manufactories, tanneries, &c., bargemen and their families who live on the tainted streams, and others residing and labouring on their banks, are not known to be less healthy, less vigorous, or more prone to specific ailments than labouring men generally; and their offspring are as numerous and as well developed as those met with in quarters remotely situated.

It remains to be noticed, that no inconsiderable amount of atmospheric impurity of dwellings is due to the very defective state of household drainage. In all or the great majority of houses in towns, the drains leading from the sinks and waterclosets to the main sewers, traverse the whole extent of the basement premises, from extreme back to front. In every instance these conduits are badly constructed, being leaky at numerous points of their transit, from which circumstance the subsoil, especially if of porous quality, becomes saturated with pestiferous moisture to a considerable distance below and on each side of the drain, rendering the air of the lower apartments musty and disagreeable, as well as positively baneful to health. Another essential fault of these basement drains is, that their course is horizontal, or with so little fall that any amount of drenching with water is insufficient to cleanse them, so that they are always more or less choked with stagnant, putrefying

refuse. There is probably no subject which demands the attention of the sanitary reformer more urgently than this.

The tenanted part of the Market-street district has a higher situation above the river level than that of the other two districts of this *lower* quarter, and a steeper descent for its terminal drainage, hence, perhaps its lower death-rate as compared with that of Deansgate and London Road. If it were not so favoured, its rate of mortality might probably be much higher, seeing that its *actual* density is twenty or thirty persons per acre greater than either of the other two. The position of the two last-named districts being much nearer to the river level, the drain current in them is more sluggish, and more liable to be arrested in its course.

Analogous instances are met with in London, and probably also in other large towns. Take for example the parish of Westminster, comprising the districts of St. John and St. Margaret, the former chiefly inland and on elevated ground, the latter low and on the left bank of the Thames. Deducting the fatalities which occur in its three military Hospitals—namely, those of the Grenadier Guards, Coldstream Guards, and Scots Fusileer Guards, and in the Millbank Penitentiary from those of the parish of St. John; and the deaths which occur in the Workhouse, Westminster Hospital, and House

of Correction from those of St. Margaret's,—the population, acreage-density, and death-rate affecting the permanent inhabitants of the two districts respectively, will stand as follows:—

<i>Westminster.</i>		Area in	Population	Persons to	Deaths to	Deaths to
		Statute Acres.	in 1861.	the Acre.	100 Births.	100 Poplatn.
St. John	260	37,483	144.16	63.85	2.239	
St. Margaret ...	657	30,730	46.77	77.74	3.037	

The Houses of Parliament are situated in the district of St. Margaret, and it was probably the regurgitating air of the large sewers in its concentrated essence that so frequently offended the noses of "honourable members" on recent occasions, and not the effluvia from the river.

Again. The parish of Marylebone situate inland, and that of Chelsea on the river, may be contrasted with similar results. Marylebone, now centrally located and crowded, having a density of 107 to the acre, has a death-rate per births of 77.41; while Chelsea, with an acreage population 34 lower in density, and comparatively suburban, has a death-rate both per births and per population a little higher. The difference is certainly not great, but the less crowded state of Chelsea and its external position, ought to render it much more healthy comparatively. Their items by the two processes stand as below:—

	Area in	Population	Persons to	Deaths to	Deaths to
	Statute Acres.	in 1861.	the Acre.	100 Births.	100 Poplatn.
Marylebone	1,509	161,680	107.13	77.41	2.342
Chelsea	865	63,439	73.34	77.56	2.343

Another still more remarkable instance is furnished by the two districts comprised in the parish of St. Martin-in-the-Fields—Long Acre, situate inland, and Charing Cross, bordering the river, and consequently on the tract of the terminal drains. Long Acre is notoriously crowded, having a density of population more than six times greater than that of Charing Cross, yet has a death-rate per births of $2\frac{1}{2}$, and per population .874 per cent lower—the fatalities occurring in the Workhouse and Hospital of the latter district having been deducted. The respective items stand as follows:—

<i>St. Martin's.</i>		Area in	Population	Persons to	Deaths to	Deaths to
		Statute Acres.	in 1861.	the Acre.	100 Births.	100 Poplatn.
Long Acre	42	11,618	276.62	69.04	2.225	
Charing Cross...	263	11,071	42.09	71.80	3.109	

One example more shall suffice to finish this category. The parish of St. George, in the borough of Southwark, situate inland, and the combined parishes of St. Saviour and St. Olave in the same borough, bordering the Thames on its right bank—one above, the other below London Bridge, adjoin each other. The fatalities which occurred during ten years in the Workhouse, Queen's Prison, House of Occupation, and the Bethlehem Asylum being deducted from the sum of deaths in the St. George's parish; and those of the two Workhouses, and Guy's and St. Thomas's Hospitals, from the general results of St. Saviour and St. Olave, the population, acreage-density,

and death-rate affecting the permanent inhabitants of these two groups respectively, stand as follows:—

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.	Deaths to 100 Poplatn.
<i>Southwark.</i> St. George	282	55,510	196.84	65.64	2.250
St. Saviour.....	419	55,226	131.80	70.81	2.431
St. Olave.....					

In a report published a few years ago (which I am unable at present to find, nor do I, to my regret, remember the author's name) on the relative healthfulness of occupations in London, it was stated that the Thames watermen enjoyed a very favourable measure of health and duration of life. It is not probable, therefore, that dampness, supposed to be charged with noxious effluvia, emitted from a stream which is perpetually renewed by rapid movement, can be a cause of insalubrity in these and similarly situated districts. It is much more likely that, in such instances at least as the preceding, the products of putrefactive fermentation in the large and terminal drains are doubtless the more mischievous agencies.

RATE OF MORTALITY OF MANUFACTURING AND NON-MANUFACTURING TOWNS COMPARED.

In regard to rates of mortality affecting other large manufacturing towns in Lancashire, Cheshire, and the West Riding of Yorkshire, the results will be found to differ but slightly from those given for Manchester, although none of them will bear comparison with it in respect of density of population. The following list may serve to illustrate, approximately, the state of salubrity, as denoted by their respective death-rates, of 22 of the chief of these, ranged in the order of their occurrence in the Registrar-General's tables.

In compiling for these several items, it seemed probable that an additional means towards estimating the relative healthfulness of manufacturing and agricultural districts, as influenced by employment, might be afforded by placing, in juxtaposition with the results for each town, those also of the entire Unions, of which the respective towns form the centre. For, the suburban populations of growing manufacturing towns are, in most instances, largely engaged in the same branches of pursuits as the more central masses which they surround; while the populace situated immediately beyond the precincts of county towns (with three or four exceptions*) are as largely so in agricultural and the collateral industries.

* Norwich and Newcastle for instance, and in a less degree, Nottingham and Derby.