

**On the cleansing operations of Edinburgh, as compared with other towns /  
by Henry D. Littlejohn.**

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ON THE  
CLEANSING OPERATIONS OF  
EDINBURGH,

AS  
COMPARED WITH OTHER TOWNS.

BY  
HENRY D. LITTLEJOHN, M.D.,  
F. R. C. S. E.

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*Read before the Social Science Association 1863.*

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THE object of the present communication is to bring as briefly as possible under the notice of the Section of Public Health, the sanitary arrangements adopted by the authorities in Edinburgh, by which not only are all accumulations of filth and solid refuse by the inhabitants prevented, but by the sale of such matters, the expense of cleansing the city is greatly diminished, while at the same time a cheap fertilising agent is placed at the disposal of the agricultural community.

At present much is said and written about sewage and the importance of preserving for agricultural purposes the *liquid* refuse of large towns. We have Blue-books devoted to the subject, in which it is abundantly proved that the loss of fertilising products, arising from the waste of sewage in Great Britain, is something enormous ; and that, while the farmer has to invest a large portion of his capital in manures, such as bones, guano, &c., the cost of which is much enhanced by the expense of carriage and their increasing scarcity, we are daily polluting our streams and rivers with the very substances the impoverished land requires, and without which, in some shape or other, it rapidly becomes unproductive.



As to the manner in which the sewage might be collected, there is no difficulty. In all towns with a system of drainage it is conveyed into large sewers, and can at once be made available for the purposes of the farmer. The only questions which have arisen refer to these three points, viz. :—

First, the best methods of deodorising the sewage ; secondly, of applying it to the land ; and thirdly, as to the distance from towns at which these operations can be safely carried on. Years may, however, elapse before these questions are satisfactorily answered, and the sewage be put to productive use. Our manufacturing chemists are not unwise in their generation, and no class know better than they the amount of organic matter that is enveloped in the city *ejecta* ; but, then, so long as the components of artificial manure can be purchased ready-made at a cheaper rate than these products can be extracted from sewage, so long shall we find that the utilising will be postponed. Commerce does not profess to minister to the health of towns, but to make money. And nothing will induce agricultural chemists to come to the aid of the scavenger until it is their interest to do so. Meanwhile, since science keeps aloof, let us see what can be done by the simple mechanical appliances of the broom, the shovel, and the dust-cart.

In all our towns there is a large daily accumulation of *solid* refuse, readily and at once applicable as a manure—the full value of which, as a commercial commodity and a source of municipal revenue, is not fully recognised. In many instances, no doubt, it is ultimately put to some useful account ; but what I am at present advocating is the daily collection and removal, by local authority, of the solid refuse of towns, so as to constitute a source of civic income, and at the same time to confer benefit on the surrounding country, by supplying it with a cheap and effectual manure. And I think it redounds somewhat to the credit of Edinburgh that now, for a long series of years, by this simple method of exchange, it has enriched both itself and the neighbouring land ; while at the same time fulfilling one of the most important sanitary re-



quirements, viz., the removal of external filth. In none of the large towns of England—the metropolis not excepted—is any systematic attempt made for its daily collection ; while in but a few towns in Scotland is the method pursued in Edinburgh fully carried out.

The machinery by means of which the daily collection is made is very simple.

In our local Police Act it is enacted that all offensive matters shall be taken in pails or buckets, or other proper vessels, to the streets or courts, to be emptied into the dust-carts by the scavengers or carters, under a penalty not exceeding forty shillings for each offence. Sixty carts or waggons are employed in this service, and as Edinburgh admits of an easy division into two portions, viz., an old town to the south, and a new town to the north—the tall storied houses of the one being tenanted by the poorest of the population, and for the most part destitute of conveniences, while the wealthier classes inhabit the modern houses of the other—arrangements are made whereby the Old Town and the poorer districts of the New Town are visited by the waggons twice daily (morning and evening) for the removal of refuse ; while the greater portion of the New Town only receives a morning visit.

The arrangements are under the superintendence of an Inspector of Cleaning (who has also charge of the lighting of the town), and he is assisted by eight district overseers or assistant inspectors, and 135 scavengers.

Each scavenger has an allotted beat or portion of a district within which he has to labour, and for the cleansing of which he is responsible. Again, each of the overseers has a district of the town assigned to him ; and, under the directions of the inspector, he has charge of the scavengers whose beats are comprised within his district.

The scavengers commence work (from 8th February to 25th October) at 5 A.M., and, with the exception of an interval of one hour (from 10 to 11), they continue on their beats until 4 P.M. Thirty of them, by rotation, turn out five nights each week to follow the dust-carts. On Saturday



nights the whole staff are on duty for one hour. On Sundays, they all turn out from 6 to 9 A.M. During the remainder of the year, the same routine of duty is observed, only commencing one hour later in the mornings.

The dust carts are out every morning during the period first above mentioned, from 6 to 8 o'clock. The removal of the ashes and refuse from the streets of the New Town is effected within the first hour, and from the Old Town within the second hour.

The scavengers are, however, at work for a considerable time before the carts reach their beats, preparing the ashes and refuse for being rapidly put into the carts, and they assist in this operation.

After the carts are past, the scavengers go over the beats again, and sweep up what may have been left—this they convey to covered dust boxes which have been placed by the authorities in various parts of the city, and which are regularly cleaned out every day. The remainder of the scavenger's daily time of duty is fully occupied in general work within their beats, such as the scraping and sweeping of pavements, and the sweeping of carriage ways. The average working time of each scavenger is about sixty-seven hours per week.

In this way annually 50,000 tons of solid refuse are removed from the streets and placed in depots in the neighbourhood of the city, and in convenient proximity to the various lines of railway which supply a circuit of country of fully twenty miles in extent. As manure, this refuse obtains a ready sale, and for years past the demand has been such that the orders cannot be supplied; the refuse has been carted from the streets direct to the railways, and hence the depots are generally empty. Its composition consists mainly of ashes, with a large admixture of decaying vegetable and animal matter, and I am informed that it is in most request for land of a cold clayey description.

The sale of this refuse brings into the municipal treasury £7,000 per annum, being a saving to the inhabitants of three pence per pound in the rate of assessment for general police



purposes. The whole annual cost of the cleaning of the city amounts on an average to £13,000—the chief items of which are as follows:—£6,000 go in the shape of wages to the cleansing staff. Another £6,000 is the cost of the conveyance of the refuse from the streets to the various depots ; but in this sum must be included a large item, viz., the expense attending the removal of mud and snow from the streets—a laborious, and, so far as its money value goes, totally unproductive service. The wear and tear of the cleaning plant, and the maintenance of the various depots, and expenses connected with the sales, amount, on an average, to another £1,000.

The contract to remove the refuse from the streets is exposed to public competition ; and the person chosen has not only to give guarantees as to his capability to perform the contract, but he is also bound by penalties to conduct the daily cleansing operations within a given time, and to the satisfaction of the Inspector, who, in his turn, is directly responsible to the Town Council of the city.

A capital of £3,000 is required by the contractor to enable him, by means of efficient horses, equipments, and men, to perform the work satisfactorily, and the authorities have spared no expense in providing suitable stabling, granaries, and accommodation for the carts and waggons, &c. About ten years ago they fitted up, at a cost of £8,000, a large vacant area behind the Castle for the very purpose of concentrating the various departments of the service ; and here are the public workshops, where the waggons and implements are made and repaired.

The advantages of this method of cleansing may be thus briefly summed up :—

1. It ensures that every part of the town is not only cleansed daily, but throughout the day ; and that all solid matters must be brought to the streets twice a-day, and removed from them.

2. All accumulations of filth are thus prevented for a longer period than a few hours.



3. The refuse thus collected is sold as manure, so as to yield a revenue to the city.

4. The rural districts in the neighbourhood are supplied at a moderate rate with a manure which, unlike guano and other fertilising agents, is inexhaustible.

I have not considered as unworthy of the notice of this Association a plan which has been followed with a large amount of success for many years in Edinburgh; and I think I am entitled to claim for it the attention of all interested in the health of our large towns, and the fertility of our country districts. In England especially, the solid refuse of the towns is allowed to accumulate in the form of "middens," the number of which in the principal towns is enormous. In Liverpool, during the year 1861, the number of orders to empty "middens" was 45,864, and in 1862, 40,010, giving in the one year a nightly average of 146 removals, and in the other of  $128\frac{1}{4}$ . In Manchester matters are still worse, there are upwards of 30,000 of these middens, and 300 of them are cleaned daily. At this rate many of them must remain for months receiving daily accumulations. The working of the system in that city has been graphically described in the joint report presented to the Sewage Commission by the late Dr Southwood Smith, and Mr Holland, and printed in 1861.\*

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\* "The houses present a neat and clean appearance. The doorsteps and windows of the houses are strikingly clean, and the houses altogether look perfectly comfortable and wholesome. Why are they not so? No one can mistake or doubt the cause of their insalubrity who looks at the back of the houses. Every house has a small back yard opening into the narrow passage just described. In the yard stands the midden and privy. The midden is built close to the house, and the privy adjoins it. This is the uniform arrangement, and the view of this double row of middens and privies, regularly succeeding each other for the distance of a hundred yards and more, presents to the eye of a stranger a most singular appearance. The intervening passage is often in a state of disgusting filth, partly from the contents of the privies which ooze into it, and partly from the accumulation of solid filth deposited there. In the centre of the passage there is commonly a gutter full of a semi-fluid putrifying mass, which, as the passage is on a dead level, is always stag-



The effluvia from the receptacles and the adjoining conveniences taint the air, and, in the opinion of these gentlemen,

nant. At Hyde, some of these passages are at least half a foot deep, from beginning to end, with liquid cesspool matters. As the middens and privies are close to each other, and as no attempt is made to make them either air or water-tight, the contents of the one pass into the other, and the mixed contents float, on the one hand, as just stated, into the intervening passage, and, on the other hand, against the house wall, often saturating it with moisture, and sometimes penetrating into the house itself. Over these damp exhaling surfaces, the windows of the back-room directly open, and often on entering the rooms, the privy smell is unmistakeable; in other instances, when this particular taint is less perceptible, there is a sense of closeness and oppressiveness similar to that already described in the back-to-back houses."

With reference to the Report Mr Chadwick remarks:—These local investigations were followed up by Dr Greenlow, who speaks of the cesspool taint as the great evil of Manchester, and the source of the excessive deaths from dysentery and diarrhoea, which are distinguished as foul-air diseases. I was told that sometimes the opposite of the deductions from the simple enumeration of the death-rates in Manchester and Lancashire had been demonstrated. I will be very glad to see that demonstration, especially if it be founded on a particular examination of the causes of disease. Meanwhile, I invite attention to the following account in last Registrar-General's Return of the causes of disease, showing the deaths from the diseases of the zymotic class in one year in two healthy towns of Lancashire—Manchester and Liverpool. I would invite special attention to the deaths from the foul-air diseases *par excellence*, diarrhoea, dysentery, and typhus.

	Manchester.	Liverpool.	Edinburgh*
Small-Pox, .....	125	96	67
Measles, .....	99	71	25
Scarlatina, .....	528	221	70
Diarrhoea, .....	648	632	85
Dysentery, .....	57	54	33
Typhus, .....	307	283	104
Total, .....	1764	1357	384
Rate per 1000 in 1857,	36	33	22

\* For the sake of comparison, the Statistics of Edinburgh have been added.

A more recent authority thus describes the working of the system in the poorer districts of Liverpool:—



increase the mortality of a district which, from a description of the houses, is not inhabited by the poorest classes, such as crowd our closes.

Now, refuse thus accumulated in the immediate neighbourhood of dwellings, must act prejudicially on the health; and its removal at lengthened intervals is attended, even under the best precautions, with an offensive odour from the decom-

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“There are many courts constructed on a good plan, having back-yards and conveniences to each house, and a passage between the back-yards of the contiguous courts. These courts are commonly open at both ends, which gives a proper circulation of air, and being flagged, they are easily kept clean. Such places, when they do not consist of more than six or eight houses, are, apart from the vital error of overcrowding, tolerably healthy, and are, in general, inhabited by an industrious and cleanly description of tenants. Unfortunately, however, such are the exceptions. The majority of the courts of Liverpool are very different indeed. The houses are generally built back to back, one end of the court, as a rule, is closed either by houses, or, which is worse, by the privies and ashpits; or a worse state of things still, the privies and ashpits are placed at the entrance of the court, and the only air supplied to the inhabitants must pass over their foul contents. But even this miserable state of things can be out-done. There are courts which, by a perverted ingenuity, have been formed in the following manner:—An ordinary street house has had its lobby converted into a common passage, leading to the back-yard. The passage is, of course, roofed over, and is, in fact, a tunnel from which the back-room of the original house, now converted into a separate dwelling, has its entrance. The back yard has been filled with other houses, in such manner, as to have only the continuation of the tunnel for access, and from this little area of three feet wide the houses receive their supply of light and air. The passage is generally terminated by the privy and ashpit common to all the wretched dwellings, with its liquid filth oozing through their walls and its pestiferous gases flowing into the windows of the two back-houses. The structural evils of these miserable abodes are aggravated by the filthy habits of the occupants. “What is everybody’s business is nobody’s business,” and so the duty of keeping the court and its conveniences clean is neglected. Even when the middens have been filled so as to overflow the court, no one cared to take the trouble to apprise the officers of the Nuisance Department of the fact in order to their being emptied.”—*Report of the Borough Engineer to the Health Committee of Liverpool, 1864.*



position of so much decaying matter. In warm weather these evils are increased, and on the outbreak of an epidemic, when the authorities are compelled to order a general clearance, it may be easily conceived that the operation must, in the first instance, tend to aggravate any infectious disorder. No doubt, in some of the poorer localities of Edinburgh, not provided with conveniences, the daily cleansing, especially towards evening, is by no means inodorous; but the annoyance is of temporary duration, and the filth is removed, which, in truth, is the great object aimed at in cleansing operations. It is not accumulated and allowed continually and insidiously to pollute the atmosphere, and produce disease. And even this exceptional state of matters in Edinburgh, I trust, will shortly be numbered among the things of the past; and with the general introduction of sanitary appliances, and increased facilities for obtaining ready access to an abundant supply of water, the daily cleansing of the city will eventually be as satisfactorily executed in every part of the Old Town as it is in the New.

To be effectual, the cleansing of towns cannot be left to private enterprise, or to arrangements between citizens and contractors employed by municipal authority. The general good must be provided for, and to this individual interests must succumb—otherwise the cleansing of refuse is left to the caprice of the householder, and the convenience of the contractor. Enactments must be framed, as in our Edinburgh Local Act, providing, under penalties, for the depositing in the streets and in proper receptacles all solid refuse, at times to be fixed by the authorities. The experience of Edinburgh goes to show that the collection of the refuse in carts, and its conveyance to the depots, can be most economically managed by a contractor selected by public competition.

Without some such method of cleansing, rigorously enforced, I am convinced that Edinburgh would long ago have enjoyed the unenviable notoriety of being one of the most unhealthy cities of the Empire. On the formation of the New Town to the north, the older portion of the city was soon oc-



cupied by an influx of the poor. These new-comers entered upon the possession of tall storied buildings—more like old fortresses than peaceful dwellings, both as regards their sanitary defects and their enormous solidity. Rents at once fell; necessary repairs were niggardly executed; the tenements were divided and subdivided; and, finally, as the accommodation became more wretched, tenants of a still poorer description supplied the place of the former inhabitants. If, in such a state of matters (which exists to the present hour), accumulations of filth had been tolerated, each of the “lands,” as these blocks of building are called, would speedily have become a perfect storehouse of filth; and disease in an aggravated form would have made its appearance. Thanks to the cholera, and to our repeated epidemics of fever, the attention of our local authorities was specially directed to the cleansing of the city, and, as a result, that system of cleansing was established which has hitherto, in my opinion, kept the death-rate low, as compared with many other large towns in England and Scotland.

But it may be urged, that what may be suitable, and very beneficial for Edinburgh, with its peculiar houses, where several dwellings are piled one upon another, and where separate accommodation, in the shape of yards and gardens, does not exist, is not so for other towns where the houses are small and self-contained, and provided with suitable back courts or gardens. But in all large towns with a dense population, the ground space, being of great commercial value, is carefully economised, the courts of the houses of the poor, as in Liverpool and Manchester, are small, and have no outlets to the back, so that between two parallel streets, there is a continuous line of middens or dust-heaps hemmed in between high walls, the emanations from which must to some extent pollute the atmosphere, and vitiate the ventilation of the surrounding houses. When these dust-heaps are cleansed, whether by the occupants, or at the instance of the local authority, we have the contents necessarily much disturbed by the removal, and whether all the middens of a neighbourhood are cleansed out



at once, or only a few here and there, a greater or less nuisance must be caused.

I willingly grant that very few sanitary operations can be conducted without producing offensive odours—a cesspool cannot be cleaned—drains cannot be cleared out when choked—without temporarily polluting the air ; but, were the refuse from the houses of the poor in English towns regularly removed, as in Edinburgh, morning and evening, and all accumulations prevented, there would, I submit, be less risk of injury to the health of the general population. As the drainage of our towns becomes more extensive and complete, and as the dwellings of the poor are more and more furnished with conveniences, the dust-heaps or middens will be less and less offensive ; but it must be remembered that, even under the most favourable conditions (as when the refuse comes from the houses of the rich), it rapidly undergoes putrefaction ; inasmuch as, in addition to the ashes and dust, there is a large quantity of vegetable and animal matter, the waste refuse of the kitchen—the accumulation of which in confined cellars, as in London and other towns, leads to heating and the rapid increase of the putrefactive process. The question is therefore narrowed to the one of daily cleansing of a town of all such refuse—or occasional cleansing, attended by the constant evolution of gases and the consequent pollution of the atmosphere from the accumulations. If a midden is undisturbed, emanations inodorous, and not therefore warning us of their presence, are still evolved, and, in the case of a daily-increasing accumulation, we have besides the odour from every addition.

In a former discussion, much was said about utilisation of sewage—let me finally put this question of cleansing of towns on its (to a sanitary reformer) lowest platform—viz., as proving a source of municipal wealth. It may have some disadvantages—all sanitary operations have ; but in Edinburgh, with our limited population, this mode of cleansing puts £7,000 per annum into our local treasury, and diminishes our rates. From a report regarding the cleansing department, presented to the Town Council in 1859, it appears that from



Whitsunday 1839 to Whitsunday 1859—a period of twenty years—830,000 tons of solid refuse were collected from our streets, and sold for £158,000. This is no visionary income, like that anticipated from tanking, precipitating, and solidifying liquid sewage. Surely, then, our Edinburgh method is worthy of consideration and trial, and all the more that it demands the erection of no costly works and machinery, the utility of which, in such places as London and Leicester, has yet to be proved.

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