

Suggestions for improvements in the sewerage of cities and towns / by Charles F. Moore.

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SUGGESTIONS,

&c. &c.

IN apologizing for adding yet another proposal to the many which have already appeared from all quarters on the subject of the drainage of London, and other cities and towns,—I beg to state that my experience, as a member of the medical profession for eighteen years, has enabled me to judge of the causes of disease in the many cities and towns of Europe, Asia, and Africa, which it has been my lot to reside in or visit during that period; and I feel fully justified in stating that I consider errors in drainage systems, or the absence of drainage, as amongst the most important of such causes.

Abundant evidence of the power of bad drainage, and its almost total absence, has, however, been given in the "Cholera Map" of London, in Mr. Grainger's able Report to the General Board of Health on the Epidemic of 1848-9; also in the well-known fact that cholera so generally rages along our river sides in our towns, where the poisonous emanations from the sewage in the rivers and from the sewers leading to them are, during the greater part of the year, so un-

pleasantly apparent to our nasal organs. I may here just allude to the fact not known to the public generally, that by our present system of drainage part of the sewers are virtually, in the great majority of cases in London and many other towns, but pent-up cess-pools,—for twelve out of every twenty-four hours, owing to the tide, as stated by a recent writer.

My proposed plans for the drainage and disposal of the sewage of London and other cities and towns are based upon my observations of the systems adopted in the United Kingdom, in France, Turkey in Europe and Asia, Egypt, Ceylon, India, and China, and what I have seen, read, and learned of other countries.

I allow for the variations of climate, soil, and other circumstances in my deductions from such observations. I have also considered the workings of instinct in forming the habits of the lower animals, and, as it seems to me, in guiding the uncivilized human races in their habits as regards the subject under consideration.

I cannot help reflecting upon the comparatively healthy state of enormous Chinese cities, where no prolonged accumulation of sewage is allowed; and upon the fact that it was illegal to use the Thames as a common sewer prior to a century past.

I propose to avoid in my plans the following evils :—

The generation of poisonous gases by the lodgment, for a considerable time, of putrefying matters

in cess-pools, as seen in Paris, Constantinople, Cairo, Alexandria, many parts of the United Kingdom, &c.

The constantly increasing contamination of all springs and subsoil water in or near such cess-pools or cesspool sewers, sewers or badly laid pipes, &c.

The impregnation of all soils in great towns or other places, whether from sewers of imperfect construction, cess-pools, or contaminated infiltrations from broken or obstructed sewage pipes.

I need scarcely state, that there cannot be a system so perfect as completely to avoid any leakage whatever; but by what I shall herein advise, I consider that an important amount of leakage shall be prevented, and the deficient part easily ascertained, and reached for repairs.

I would also avoid the concentration of sewage as recommended by many plans, and the great increase of expense, and the evil of the formation of cess-pools for every house.

The gross amount of sewage diluted with water will be much lessened by my plan; and as water is decomposed by the more solid parts of sewage, and hence arises a variety of most noxious gases, the result will be much more favourable to health than the present systems.

There will also be a large return for outlay, as a very "powerful manure," to use the words of the learned Sir H. Davy, will be obtained by the system which I advocate, and an economy to some extent in the water required for towns.

The daily removal of the contents of the filtering

cess-pools which I propose can be obtained without unpleasant consequences, as deodorization will be effected as fast as accumulation occurs.

I do not think it advisable to interfere with the long-tried and useful egg-shaped sewers and their triple drainage capabilities, as shown by Mr. Bazalgette in the Blue Books.

I will divide my subject into two heads, premising that the oval brick sewers be retained for surface and overflow drainage of filtered house sewage.

I. I would retain the present water-closet system in the houses of the upper and middle classes, unless otherwise desired. Every five, ten, or more houses of such classes to be provided with a filtering and deodorizing cistern, divided into compartments furnished with a self-regulating apparatus which would cause a discharge of disinfecting powder, as dry peat powder, powdered gypsum, peat charcoal, coal ashes, lime, or other deodorizing solid or fluid, proportioned to the ingress of house sewage,—the latter to be conveyed from each house by earthen pipes properly set in a bed of masonry, or small brick sewers, or other suitable means, and at such an inclination as to insure proper discharge; also each deodorizing cistern to be provided with a suitable exit channel for filtered and deodorized fluid, to convey the same into main-street sewers. Every such cistern to be placed in a

convenient position in a back street, lane, open space, or yard, that it may be daily emptied of all its solid or semi-solid contents, and that it shall be so constructed that its compartments shall permit of this being done without inconvenience or interruption to the house sewage, and so as to permit the removal of its contents by suitable trap-doors or sluices; the whole to be made of flags or strong slate, or other suitable material,—due attention to be paid to position of said cistern as to fall, &c. And I would suggest, that persons in the immediate vicinity of such cisterns should have a portion of proceeds of sale of contents under some circumstances. District overseers to keep constant supervision over the state of such cisterns, &c.

II. I would have closets of simple construction, yet such as would insure immediate deodorization, in all lodging-houses, hospitals, barracks, poor-houses, and houses of the lower classes, applicable to both solid and fluid sewage,* or either, as the case might determine, and either in connexion with the general sewage or not; the process of deodorization to be effected by drawing a simple valve or other contrivance whereby a quantity of powdered gypsum,† dry powder of peat,‡ peat charcoal, coal ashes, lime, or other deodorizing substance, should be discharged

* I would much prefer separation of solid and fluid matters, for many reasons.

† Professor Way, London.

‡ Professor Davy, Dublin.

upon the matters in such closet. Each closet to be cleaned out thoroughly at least once a day in winter, and twice daily in summer, and contents to be removed in covered waggons or barges, or by railway, and at once sent to the country as manure. As no water should be used in these closets, the bulk of matters to be removed would be very small; and as the closet-pans would be made portable, no difficulty would be experienced in emptying them into waggons, &c.

The other house sewage, as from kitchen, &c., I would have conveyed by suitable drains to main sewers, or, if advisable, to a day cistern, with overflow-pipe and separating compartments, as in the case of the houses of the more opulent; but the cistern for the lower classes, public buildings, &c., being only for kitchen and laundry sewage, would be of more simple construction.

I would also hope that all public urinals, at least in rural towns, should be so arranged as to contribute their most valuable manure to purposes of agriculture, instead of polluting our rivers, &c.; and would suggest very inexpensive tanks and means of conveyance for the same out of our towns.

I am glad to find M. A. Chevalier fils* advocating measures in France similar in many respects to what I have advanced above, and have for some time been suggesting to some of the authorities.

* Journal de Chimie Médicale, &c. Paris, Juin, 1854.

I do not enter into a minute description of the apparatus that I would employ in carrying out the two plans of drainage, and disposal of sewage, above stated; as I do not think a pamphlet of this nature suitable for that purpose. I shall merely say, that the means I would propose should be effected by comparatively simple machinery; that I would not employ metals to any considerable amount, as they are liable to suffer from the action of gases; and that the first outlay would not be great, especially where a good system of the old brick sewers exist; and that the cost of maintaining the system in efficient working order would be more than paid by the profit on sale of manure.

I feel very confident also, that improved vigour and longevity, as well as morality, amongst our labouring classes, and consequently lighter poor rates and expenses inseparable from the prevalence of crime* amongst so many of the poorer inhabitants of our cities and towns, would in no long time be attained by a well-worked system of drainage. I do not wish to give undue importance to my subject, nor to overlook the great necessity for improvements in ventilation† of our houses for high and low, and other means, such as providing commodious hospitals, in good, cheerful situations, for cases of epidemic disease amongst the houseless, be he sailor or landsman,—for I would not keep the sailor, just ar-

* See Dr. Southwood Smith's able writings.

† See Dr. Neil Arnott's Letters to the Times, and his other publications.

rived, possibly, with the seeds of a dangerous disease lurking in his system, either on board his own ship, or in an hospital hulk, where depression of spirits is sure to increase the chances of his becoming ill; nor would I withhold from the poor of our towns the advantages of a good hospital, to be called an "Epidemic Hospital," not a cholera hospital, where he would receive the best treatment, whether suffering from cholera, typhus fever, small-pox, diarrhœa, or other disease, like those so often epidemic in the crowded purlieus of our finest cities.

That a crowded city, however, is not always necessary to produce a severe disease, I will just instance the Irish cabin of ten years ago, which, though situated on the lofty mountain, surrounded by the freshest and purest air, became, through the poverty and ignorance of its inhabitants, anidus of disease, no attention being paid to its ventilation, and still less to its drainage, having its floor sunk below the level of the hill side, possibly for shelter from the storm, and surrounded outside by pigsties and manure heaps; but Ireland shows now few, if any, such hovels.

We would not have much difficulty in finding in other countries the parallel of the old Irish cabin, and corresponding results, though, perhaps, in the form of disease we might find a difference, and instead of typhus we might observe scrofula, phthisis, cretinism, cholera, dysentery, or ophthalmia, to result from like causes, according to the varieties of climate, &c.

I should exceed the limits of this little pamphlet were I to more than allude to the still very defective

state of cleanliness and ventilation on board so many ships trading to our shores. I cannot pass over the fact of the increased facility in the carriage of epidemic disease, if I may so speak, afforded by neglected and unventilated ships, and even by dirty cabs and other carriages for conveyance of the public. Comparatively few ships are ventilated at all when severe weather compels "everything to be battened down," or in other words, when the ports, hatchways, &c., are secured, so that the vessel may not take in water, as, when this happens, all passengers are confined "below;" and any one that has been in a crowded or dirty ship can remember the horrors of such a state of things. Yet all this might be avoided by the judicious arrangement of ventilating tubes in each division or compartment of a ship, combined with cleanliness; and what is no less true of houses, it is remarkable, that by thus rendering them healthful, the timbers and other materials of their construction are preserved from decay.

I do not consider it necessary to bring forward any of the hundreds of facts on record to prove what I have advanced above, as I think they are so generally known, and have been so well written for public information by the Board of Health, by Mr. Charles Dickens, Dr. N. Arnott, and many other philanthropists in these kingdoms, in America, and elsewhere.

I have already alluded to the healthiness of the great and crowded cities of China, where pollution of the soil and rivers is prevented by the jealous care that ancient nation takes "that nothing be lost." I

would now draw attention to the valuable letter of Lord Palmerston to the Synod of Edinburgh, wherein he enforces observance of the laws of nature, pointing out, that by cleanliness and industry we may turn to our great advantage those things which, neglected, become the causes of sickness and misery. I would also beg to refer my readers to that most valuable *brochure* written by Mr. Bardwell, and which I have before quoted as "Healthy Homes," in which the talented and practical author draws attention to the importance of the laws of health as maintained by the ancient Greeks, and by Mahomet, whose disciples at this day apply an epithet to us English, describing us, as I learned in the East, "as those who do not wash in running water." But, to return to Mr. Bardwell's work, it is there shown how much benefit is derived from the Jewish cleansing still practised by that people following their ancient laws.

In conclusion, I will only add, that improvements in the drainage of buildings in Lambeth reduced the mortality by over 4 per cent., and a still more marked amendment was observed amongst the lodgers in improved lodging-houses in Wigan and Wolverhampton; and that the amount of fatal disease still existing in London and many of our large towns is therefore over 4 per cent. greater than it ought to be were proper measures for drainage and ventilation carried out.

THE END.