

## Selected Articles.

### UTILISATION OF SEWAGE.

From a chemical point of view the sewage question has long been definitively settled. There is no doubt of the immense intrinsic value of the manure constituents of sewage which are annually wasted under the present system of disposing of it. Nor is there any less doubt that, under this system, those valuable constituents are distributed through such a disproportionately vast mass of water, that it is entirely out of the question to think of turning them to any profitable account in agriculture. The case is precisely analogous to that of the gold-bearing minerals in Wales, or the auriferous Rhine sand. The gold is undoubtedly there in immense quantity in the aggregate; but it is so disseminated throughout a preponderating mass of worthless material, that it is practically inaccessible. No chemist acquainted with the subject; no engineer or farmer at all capable of appreciating the chemical facts relating to it, has, or can have, but one opinion as to the utilisation of sewage, viz.: that it is a thorough delusion to suppose that it can be carried into effect, so as to admit of the sewage of London being disposed of, and made a source of profit.

This opinion, however, is far from being accepted or acquiesced in generally. A great number of persons believe—for it is only belief with them—that the sewage of London, representing an aggregate value of perhaps not less than a million sterling per annum, can not only be utilised in agriculture, but even made a source of profit to those whose business it is to get rid of it somehow. There are, indeed, a few who endeavor to bring forward evidence of such a possibility, and there is no doubt that many of the facts which they rely upon are unquestionable. There is no doubt that sewage, when put upon cultivated land, does act as a powerful manure, and produce very excellent results in augmenting the produce of the land. This has long been proved and admitted by every one; and this is precisely the circumstance which leads people astray in their opinions as to the utilisation of sewage. If, they argue, this can be done here or there on this or that patch of ground, why should it not be done with the whole of the sewage of London, and why should not the value of the immense quantity of material now wasted be realised? The reasons why it cannot be done have been given over and over again—any time these six years past—but they have not been heeded. Those reasons are of precisely the same kind as the reasons which operate against the extraction of gold from Welsh minerals, and are probably much more forcible. It is all very well to say there is a bar of gold weighing forty or fifty ounces, and to appeal to that as a conclusive proof that it can be got; or to say that such and such results have been obtained by applying sewage to land. This kind of evidence and argument will have great weight with many, but it is not conclusive, nor is it to the point. If the gold that has been extracted, and which is worth some 4*l*. an ounce, has cost 6*l*. an ounce to get, and if this fact can once be perceived, there is an end to the chimerical opinions as to its value and the

possibility of extracting it. To all intents and purposes it might as well not be there.

Now this is just the case with regard to the agricultural application of sewage, with the additional difficulties, in the case of London, that the quantity of the sewage is so immense, and subject to such large increase, as to render it probably impossible to find a sufficient area of land to receive it within a reasonable distance. Further difficulties then arise from the situation and level of the land round London, and, above all, from the fact that it is only to grass land that the sewage could be applied so as to meet the absolutely necessary requirement of disposing of it continuously every day throughout the year. No doubt a larger proportion of the land immediately round London is under grass than is the case in some other districts, but still it is only a fraction of the land that is so situated, and precisely that land is in no want of sewage, being abundantly supplied with manure produced by the consumption of its own hay in London, and carried to the land by the carts bringing up the hay.

There was, some years ago, a bare prospect of the utilisation in some degree of the sewage of London being effected. The inhabitants of London having determined upon incurring a vast expenditure for the purpose of getting rid of the sewage, which might have applied that expenditure in such a manner as to render the sewage available to farmers round London, instead of devoting it to a means of throwing it away into the sea, as is to be done now. This was a prospect that was certainly worth investigation at that time; but it may safely be said that even with regard to it, there are no data which would in any way justify the opinion that such a mode of disposing of the London sewage would have been attended with advantage, or have been at all practicable.

So far as the expenditure on sewage disposition, originally contemplated, is concerned, this opportunity is past. It may be that it will recur again, if, as some are disposed to consider, the means that have been adopted for getting rid of the sewage should prove to be insufficient to meet the requirements of the case. If the discharge of the whole bulk of the sewage into the Thames at one place should be attended with the disadvantages of reflux up the river, and of pestilential exhalations in the neighborhood of its discharge, the question as to the disposition of sewage will revert to the position in which it stood some six years ago.

The obstinacy with which, from time to time, schemes for the application of sewage in agriculture are urged upon the notice of the public, without any adequate foundation and in the face of overwhelming antagonistic evidence, is simply a revival of the spirit manifested years ago in the attempts to manufacture solid manure from sewage, attempts that were, if anything, more visionary and absurd than the advocated utilization of sewage under present circumstances. In Mr. Lawes' pamphlet it is stated that an expenditure of some 60,000*l*. was required to satisfy those who insisted upon the very high agricultural value of solid manure obtained from sewage by lime, that the value assigned to it by himself and others was correct. And yet this was a fact that was almost self-evident, and which required only a consideration of the simplest chemi-