

**SEWAGE TREATMENT, PURIFICATION, AND
UTILIZATION. A PRACTICAL MANUAL FOR THE
USE OF CORPORATIONS, LOCAL BOARDS,
MEDICAL OFFICERS OF HEALTH, INSPECTORS
OF NUISANCES,
CHEMISTS, MANUFACTURERS, RIPARIAN
OWNERS, ENGINEERS AND RATEPAYERS**

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Sewage Treatment, Purification, and Utilization. A Practical Manual for the Use of Corporations, Local Boards, Medical Officers of Health, Inspectors of Nuisances, Chemists, Manufacturers, Riparian Owners, Engineers and Ratepayers by J. W. Slater

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A

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BY

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AND DYE WARES."

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PREFACE.

THE importance of the Sewage question may, perhaps, be fairly gauged by the number of patents of which it has been the subject, and its still unsettled state may be concluded from their varied and contradictory character.

Freezing and heating, concentration and dilution, electrification and magnetising, the addition of oxidisers and deoxidisers, of ferments and preventives of fermentation recommended, if not actually tried, show the want of any distinct and generally recognised principle.

I have, therefore, thought it my duty to lay before the public in plain language and in a concise form the result of my experience in treating sewage and waste waters. That experience dates back to the year 1868, and except in 1870 my attention has during the whole of that time been almost exclusively directed to this question. I have worked with sewage in every quantity, from a few ounces in a beaker or a hydrometer-jar to a daily flow of ten million gallons. I have had opportunities for examining almost every known process, irrigation, filtration, aeration as well as precipitation in its many variations. I have studied sewage in droughts and in storms, in hot weather and in cold, by day and by

night, in residential towns and in industrial centres. My conclusion is that there is no one process universally applicable.

Unfortunately there is no subject, outside the range of party politics, on which so much envy, hatred, malice, and all uncharitableness prevail as on the treatment of sewage. But I ask people to judge by the evidence of their own senses. Do not read about this or that process, but go and look. I know instances where bitter enemies of chemical processes have been convinced of their error by just one unexpected and unprepared for visit of inspection.

A few supplementary remarks and explanations are needful :—

The list of patents is not by any means as complete as the author could have wished. Under the existing state of the Patent law nearly twelve months may elapse from the date of application to that of the acceptance of the complete specification, and more time elapses before such "complete" is printed and is to be found in its place in the Patent Office Library. In the meantime no one can tell whether a patent has been abandoned or not. The difficulty is increased by the circumstance that provisional specifications, if not proceeded with, are now not printed, as heretofore. This renders it difficult to obtain a correct list of the patents for any given year until about eighteen months have elapsed from its termination. When opposite the number of a patent there appear the words "not published," or a blank space, the reader will understand that the "complete" was not to be found at the dates when the author made his searches.

The specification M.L.G.G. Daudinart (A.D. 1886),

No. 4,203, was misunderstood. The zinc precipitate is not applied as a manure.

It should be noted that, if we may judge from the local papers, the process adopted at Hendon (p. 91) gives but a very limited degree of satisfaction to the ratepayers.

As regards "germs" or morbidic ferments, it is now generally held that these tiny organisms when introduced into the system are not the direct causes of disease and death, but that they generate within the body they invade certain most intense poisons, which do the deadly work. Practically speaking this is not a matter of importance. If we can prevent the entrance of these "germs" into our system, or if we can destroy them after entering, they can have no opportunity to develop poisons.

Here comes up another point:—In addition to the disease-germs, "pathogenic organisms," as they are technically called, there exist in sewage and in other waters germs of a very different class. These latter it would seem, according to the researches of Dr. Dupré, play a very important part in the purification of waters. If, therefore, we remove all germs, whether by filtration, precipitation, disinfection, or any other process, we may in some cases do more harm than good. Can we, therefore, devise some discriminating means which shall destroy the evil germs and leave the useful ones untouched? If we can do this we may hope to render sewage potable. Here, then, is scope for the inventor.

The action of electric currents upon polluted waters remains to be studied. Laboratory experiments hold out hopes, but on the large scale they may prove too costly.

The shape, size, and general construction of tanks, (p. 111) likewise require further study. I may here record my conviction that, wherever practicable, intermittent working is preferable to continuous treatment. The sewage is better dealt with at a less outlay for power, chemicals, and labour.

There is surely room and need for that fair co-operation of experts which Dr. Dupré asks for, as quoted on p. 267.

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