

# THE Sanitary Review

SEWERAGE, SEWAGE DISPOSAL, WATER SUPPLY AND  
WATER PURIFICATION

## MASSACHUSETTS STATE BOARD OF HEALTH 1908 REPORT.

The fortieth annual report of the Massachusetts State Board of Health for the year ending November 30th, 1908, is to hand.

To the sanitary engineer interested in sewage disposal this report will prove of exceptional interest.

It contains over 250 pages, devoted entirely to a review of the valuable experimental work carried out during the past twenty-one years. The review is edited by H. W. Clark, chemist of the Board, and Stephen DeM. Gage.

The thorough scientific investigations carried out at the Laurence Experimental Station since 1888 have proved the foundation of much of our present knowledge of the principles of sewage disposal. In fact, it is no exaggeration to say that most of the modern methods based on biological principles are the direct result of the early experiments in intermittent filtration on Laurence sewage.

The editing in one complete volume of the whole of the main features of this experimental work, and the deduction of conclusions which are now more clearly made apparent in the light of fuller knowledge, provides the most valuable work on sewage disposal which it is possible for the sanitarian to possess.

One feature brought out clearly on page 263 of the report is worthy of special attention. It is generally concluded that the sewage provided by American cities is much weaker than the standard of English sewage. While this is the case, however, the sewage which has been experimented with at the Laurence Station for the last fifteen or twenty years is every bit as strong as the average English sewage.

Such typical English communities as Accrington, Birmingham, Leeds, Manchester, Rochdale, Sheffield, Chorley and Heywood all equally compare with Laurence in strength of sewage.

This fact will come to many as a surprise, as it has been customary when speaking of British as compared with Massachusetts experimental work to refer to the former as not having any exact relation to American conditions. The point would, therefore, appear that if exact application is not granted with reference to English experimental work, it cannot be granted with reference to Laurence experimental work. The real point, however, is that no experimental work has exact application unless all factors and conditions are equal.

In applying the results of experimental work the whole of the factors and conditions relating to such work must be thoroughly understood.

Too often the excuse for a particular line or method of sewage treatment is based on the simple conclusion: "It is a success at Columbus, Ohio," or "Experimental work at Massachusetts gave splendid results." When

the question is put: "Are all the factors and conditions equal?" no intelligent answer is forthcoming.

Many failures in sewage disposal treatment have been due to what are called "Visiting deputations." A deputation may spend much time in travelling and a short time in viewing some completed works which have been based upon exact knowledge of the local conditions and requirements. The local conditions and requirements are not, however, the main features of interest. The main features are that the works cost so much per head and produced results of a definite satisfactory standard; but the exact reproduction under different environment and conditions produces no comparison either in cost or efficiency standard.

The value of experimental work is undoubted, but we think it well to point out the danger in accepting bare conclusions without careful and studious reference to all the data connected with them.

Out of the 250 pages of the 1908 Massachusetts Report engineers will be tempted to look for conclusions and casually skip a great amount of what may at first sight appear dry and unnecessary.

Engineers may rest, however, assured that there is not a sentence published in the report which is not of prime importance, and if any information of value is to be successfully deducted and put to practical application, it can only be by a full grasp of the whole of the minute data relating to the experiments.

## THE EFFECT OF A SINKING HEAD ON LARGE CASTINGS.\*

By Thomas Kennedy.

Cast-iron is not a pure metal, for in addition to pure iron it always contains considerable and variable quantities of silicon, sulphur, phosphorus, manganese and carbon chemically combined with iron and carbon uncombined, existing as little, shining plates of graphite in the mass of the iron, so that on taking a wide average there is only from about 90% to 91½ per cent. of metallic iron in practically any cast-iron. As cast-iron comes molten from the cupola, it contains, in addition to the preceding list of impurities, more or less slag—the less the better.

Large pipes are, as a rule, specified to be cast on end, with the upper end prolonged to form a sinking head, which is afterwards cut off. The object of this paper is to show the advantages of this and the desirability of it in nearly all large castings.

The author, therefore, proposes to deal with the results obtained in casting some large columns about 32 feet long,

\* Read before the Association of Water Engineers, York, England.