

building, so as to be able to do the mixing by mechanical means; the solution could then be fed into the pump wells. Wooden tanks are liable to be digested by the hypochlorite in the course of time.

The pumpage is now 50,000,000 gallons per day. The cost of treating this quantity is \$5.25 for labor and \$4.95 for chemicals, making a total of \$10.20 per day, or 20 cents per 1,000,000 gallons. The installation cost was about \$225.

### SEWAGE PURIFICATION INSTALLATION AT PRESCOT, ENGLAND.

The original sewage disposal works in Prescott were designed by Mr. Joseph Brierly, of Blackburn, and consisted of two sedimentation tanks and eight acres of land. At the time Mr. Brierly had advised the purchase of 48 acres, but only the smaller amount was actually obtained. It was soon found that the land was not only inadequate in amount, but was also unsuitable in character, being of a dense clayey nature. It gradually became sewage sick, and complaints in regard to the pollution of the brook, by the inhabitants of the

Hampton, as the result of many years' arduous experimental work, and therefore they secured his co-operation. It is only by means such as these that engineers are able, with any degree of exactitude, to put into being, and to secure the full benefits accruing from continuous research work. The purification of sewage being essentially a de-solution operation, the great desiderata must necessarily be to expedite the de-solution changes, and to remove the separated matters as soon as practicable. Thus when the sewage first reaches the works it passes through a series of sand pits, screens, and detritus tanks, from which the deposited and arrested matters are removed daily. It then enters the hydrolitic tank, which the engineers believe to be the latest word in the scientific disposal of sewage. The advantages possessed by this form of tank being that (1) the coarser suspended solids are more rapidly and more perfectly removed from the sewage; (2) the finer suspended and colloid matters, which escape from ordinary tanks, are withdrawn, to some large extent, by the self-cleansing colloidors placed in the tank; (3) the arrested sludge is more easily and more completely removed from the tank; and (4) the effluent is freer from suspended solids, and less influenced by the products arising from the decomposing sludge. From the hydrolitic tank the liquid passes on to the

#### Prescot: Average Results.

Sample.	Solids.			Nitrogen.						Percentage purification referred to the crude sewage.				
	In suspension.	Separation effected by filter paper.	In solution.	In colloid state. Separated from solids in solution by dialysis.	Chlorine.	Ammoniacal.	Albuminoid.	Nitrous.	Nitric.	Oxygen absorption, 4 hours at laboratory temperature.	Dissolved oxygen.	Solids in suspension.	Albuminoid Nitrogen.	Oxygen absorption.
Crude sewage ..	38.6	83.6	10.9	11.5	8.62	1.14	nil	nil	10.6	—	—	—	—	—
Detritus tank ..	36.0	81.8	—	11.8	8.73	1.12	"	"	10.8	—	—	—	—	—
Hydrolitic tank ..	7.1	71.9	7.2	10.2	8.03	0.56	"	"	6.2	—	80.3	50.9	41.5	
First filters .....	4.4	77.4	trace	9.2	1.50	0.068	.13	2.16	0.88	—	88.6	94.0	91.7	
Second filters ..	trace	90.3	nil	9.5	0.07	0.022	trace	2.78	0.27	0.92	99.	98.1	97.5	
The brook water into which the effluent passes	7.0	45.8	—	3.5	0.11	0.078	trace	trace	0.59	—	—	—	—	—

district below the outfall, became more and more frequent. In 1906 the Prescott Urban District Council decided to advertise for competitive schemes, the result of which was that Mr. Harry W. Taylor, A.M.Inst.C.E., of the firm of Messrs. Taylor, Wallin and Taylor, was, on the adjudication of Mr. Priest, awarded the premium, and subsequently was appointed to carry out the scheme. A commencement was made in 1908, and the work was completed in the early part of this year. The installation has been in operation for the last five months, and from the outset has been working in a highly satisfactory and efficient manner. In the preparation of the scheme the engineers recognized the impossibility of converting and oxidizing the sewage within any practical area of tanks and filters. They were of the opinion that the essential operation was the withdrawal of the impurities from the sewage—the reduction of the foul sewage back to water by the de-solution of the sewage solids, rather than by liquefaction of such matters, and their chief object was to install as self-cleansing a mechanism as possible. The view they held was that which had been demonstrated by Dr. Travis, of

filter, upon which it is distributed with great evenness by water-wheel distributors. The filters are 7 feet 6 inches deep, and are arranged in two series, two in each. They have a total area of 2,143 square yards, and are designed to take 28 gallons per square yard per foot in depth. The material in the filters is of clinker, coarse in the primary and fine in the secondary, but in each case sufficiently coarse as to be self-cleansing. Between the upper and lower filters and succeeding the latter are settling tanks to arrest the extruded suspended matters. The water then passes down the effluent ladder to the stream. The sludge removed from the several tanks is conveyed to trenches in the land, and covered over as soon as it will bear the weight of the earth. The ultimate results have been more than satisfactory, more even than was hoped for. The sludge is disposed of without nuisance, there are no offensive odours on the works, and the final effluent is a brilliantly transparent liquid, appreciably better than the brook it enters. The average analyses relating to the several stages of the treatment process are shown in the accompanying table.