

The warm air in the sewer pipe actually thawed out the ground for a foot and a half around it, and started the water.

All the rock in the main trenches and in some of the house trenches, which was nearly vertically bedded slate, was taken out by contract with steam drills at a price of \$4.00 per cubic yard. This might have been done somewhat more cheaply with hand drills by days labor, but it would probably have extended the work into the next year and cost more in the end. There was a great deal of rock in the town, and the steam drills, working night and day, took it out very quickly. There was removed in the town altogether about 2,650 cubic yards.

The cost of earth trenching, which was done by days work, was from 30 to 35 cts. per yard, and refilling trenches from 10 to 15 cts.

In rock the trenches were taken out 6 ins. below grade, and filled up to grade with good, well rammed earth, making a good bed for the sewer to lie on.

The lightest grade for a sewer in the town is the 12 inch sewer on Ochlerloney st. from Pine to Wentworth sts., a length of about 990 ft., falling at the rate of 0.435 per 100.

In connection with sewer ventilation the writer noticed that on frosty mornings warm air was escaping from the mouths of the catch-pits in the more elevated portions of the town, while if a piece of lighted paper were set in front of one of the lower catch-pits a strong current of air was seen to be drawn in. This, of course, is only the result of nature's law that warm air rises. As Dartmouth is rather hilly and most of the grades steep, this circulation would naturally, in cold weather, be very rapid, and serve as an excellent ventilation for the sewers. An opportunity has not yet occurred to notice the effect of this in warm weather, but it is supposed that there would be less circulation the more the temperature of the outside air became equal to that of the sewer.

This circulation might in very cold weather endanger the safety of the lower catch-pits on account of freezing the two feet of water always lying in the bottom. This matter has not yet been fully investigated, but as the weather in Dartmouth never remains cold for any great length of time, it is thought they will be tolerably safe.

The cost of the water service was about \$59,370 and that of the sewers \$30,970. The work was begun in the fall of 1891, under the direction of Mr. C. E. W. Dodwell, M.I.C.E., M.Cm.Soc.C.E. In that year the pipe house and a great part of the main pipe line were built, also the sewer outfalls at North and Boggs streets, and some of the sewers laid. Mr. Dodwell resigned in November to accept another position when the work was taken charge of by Mr. W. G. Yorston, C.E. In the following year the remainder of the work was done, the last house service being filled up on December 31, 1892. The deep cutting about half a mile from the lake was done in the winter of 1891-92 and the main line finished in May, 1892. Owing to some delay in repairing the leaks on the line, the water was not finally turned on in the town until November 1st. It has remained on ever since, and given every satisfaction to the rate-payers, as is evidenced by the fact that at a public meeting held March 23, 1893, the town council was authorized to go to the Legislature for permission to borrow \$35,000 to carry on the proposed extensions spoken of above.

Note added Feb. 12th, 1894:—During the summer of 1893, the following extensions were made to the water and sewerage systems: There were laid 14,500 ft. of water pipe, making a total now laid of about $7\frac{1}{2}$ miles; also 10,200 ft. of sewers, making a total now laid of over 4 miles. 31 additional hydrants were set, making a total now in use of 55. The number of houses now connected with the water mains is 350, and those using the sewers number about 250. The work of trenching was done in small contracts, and cost on an average about as follows: Solid rock, \$2.60 per cubic yard; loose rock, 50 cts. per cubic yard; earth, 26 cts. per cubic yard. The contractors seem to have done very well at these prices. Flush cocks, varying in size from $\frac{1}{2}$ to 4 inches, have been placed at the dead ends of most of the sewers; these are comparatively inexpensive, and are very effective in their work.