

it suitable for the purposes of the society, at a cost of \$3,000. It is also proposed to build in the rear a one-story hall, inside dimensions 25 x 56 feet, at a cost of \$3,000, which amount the council proposes to obtain as an additional subscription to the building fund, from members and friends of the society. To meet the expenditure which it is proposed to incur at present, \$11,000, the council will use the whole sum now to the credit of the building fund, amounting to about \$4,500, and borrow the balance, \$6,500 on mortgage at 4½ per cent. This investment of the society's funds will improve its position, as the rent of the present premises amounts to more than the interest upon the cost of the building and improvements.

### THE CONSTRUCTION OF THE MAIN INTERCEPTING SEWERS OF THE CITY OF LONDON, ONT.\*

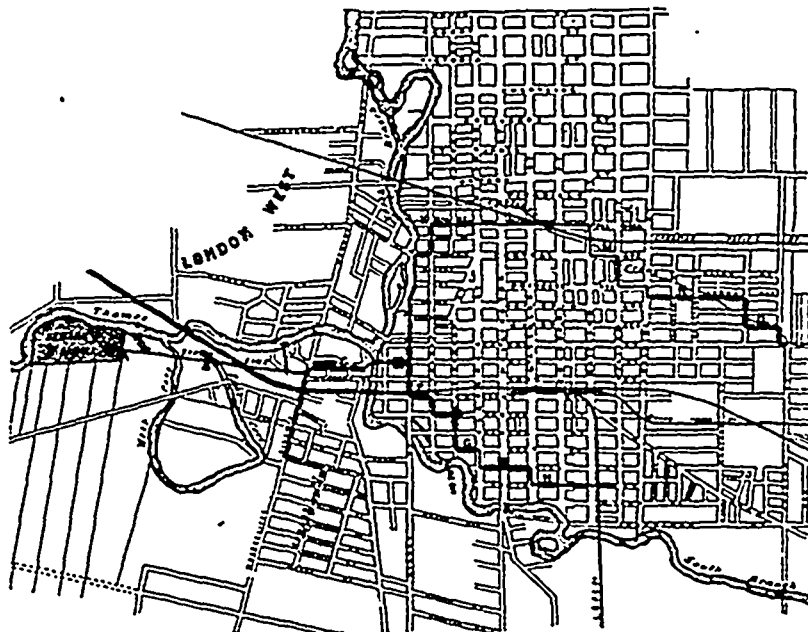
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The initial steps leading towards a decided improvement in the sewerage of the city of London consisted in the construction of intercepting sewers designed to carry the present and future sewage flow to filtration beds for purification. The main sewers at present and previously existing on King, Dundas and Wellington streets are of brick, and intercept a large portion of the present sewage of the city. The branch sewers are chiefly of glazed tile, many of which are jointed with clay, and considerable trouble has been caused by tree roots penetrating. Until within a few years, the sewers were but poorly provided with ventilation, and where manholes were built they were usually found at from one to three feet below the road surface. As will be seen by examining the map accompanying the paper, two of the old main sewer outlets (discharging about 25 per cent. of the total sewage flow) empty into the south branch of the river above a mill dam, while the third, viz., King

the work of designing the details, and of superintending the construction.

The system is practically a "separate" one. Cellar, roof and closet drainage will be accommodated, and from the portion of the city now sewered, surface water will also be taken. The regulation as to the amount to be carried during the rainstorms is to be made in "overflow" manholes, which will be described further on. The admission of the surface water as explained was not entirely satisfactory to all concerned, but was conceded. This fact and the difference of opinion of engineers consulted by the civic authorities is responsible for increasing the sizes somewhat over what would be required for "separate system" needs pure and simple. The sewage of the city proper is intercepted by two branches—the one following approximately the bed of Carling's creek, and the other the bank of the south branch of the river—meeting at corner of King and Ridout streets. From this point the flow is carried along King street, across the River Thames (at an elevation of 24 feet above low water), through South London, and across the low lands to the Farm, the South London sewage being intercepted by a pipe laid along the Wharncliffe Road. The least grade is 1 in 1,000, and the greatest 1 in 500. These are arranged to give a cleaning velocity when sewers are flowing half full. The work has all been done by contract, and, in order that it might be pushed forward as rapidly as possible, it was divided into sections ranging in value from \$600 to \$40,000.

The trenches required usually continuous timbering. This was done by the ordinary methods, using horizontal walings and vertical sheeting. The walings were usually of 2-inch stuff, but some contractors preferred them of 3-inch. Sheet piling ranged from 1 to 2-inch, according to the nature of the ground, and the contractor's idea of economy and propriety. Where possible, one waling in the centre has been made to answer for each set



street, enters the river just above the forks. When the splash boards are in position on the waterworks dam (situated about three and one-half miles below the forks), the river water is backed nearly level to this point. This condition lasts throughout the summer months. During the winter the boards are taken off, thus increasing the fall in that distance by four feet. In London South, nuisances were caused by sewers discharging into watercourses, and also a similar condition existed along the Carling's creek, which received the contents of several street sewers, as also the sewage of the barracks. To remedy the state of affairs, various reports were presented, and on September 2nd, 1896, the ratepayers voted the sum of \$150,000, to be applied to the work. This, with some \$55,000 (otherwise provided), was the amount believed to be requisite to construct the sewers, purchase the necessary land, and set in operation filtration beds below the Coves, practically as outlined by Willis Chipman, who was retained as consulting engineer. The writer, as assistant to the city engineer, A. O. Graydon, had charge of

of sheeting, but in bad ground, walings were placed at top and bottom of each. Sometimes the single and double waling methods were used in the same trench. On one small but deep section, the sheeting was laced by means of vertical walings well strutted, thus tying the various sets of sheeting together, and making it more difficult for individual sets to sink. In sewer work the proper putting in of shoring is always an important one. On many sections of the London work the banks sank a great deal. This has not always been evenly distributed, as occasionally one side would go down as much as three feet more than the other. The causes of the irregular sinking were not always apparent, but could be generally traced to undue pressure on the sinking side, or to the direction of the flow of the ground water. Frequently water entering the trench from one side would wash in the fine material, and that side would settle, while the other, being dry, would remain firm. Other reasons were the running of machines, dump-cars, etc., close to one side. In one instance the contractor piled all the earth from a 20-foot trench on one side, and the ground being satur-

\*From a paper read before the Canadian Society Civil Engineers.