

PROPOSED WATER WORKS TUNNEL.

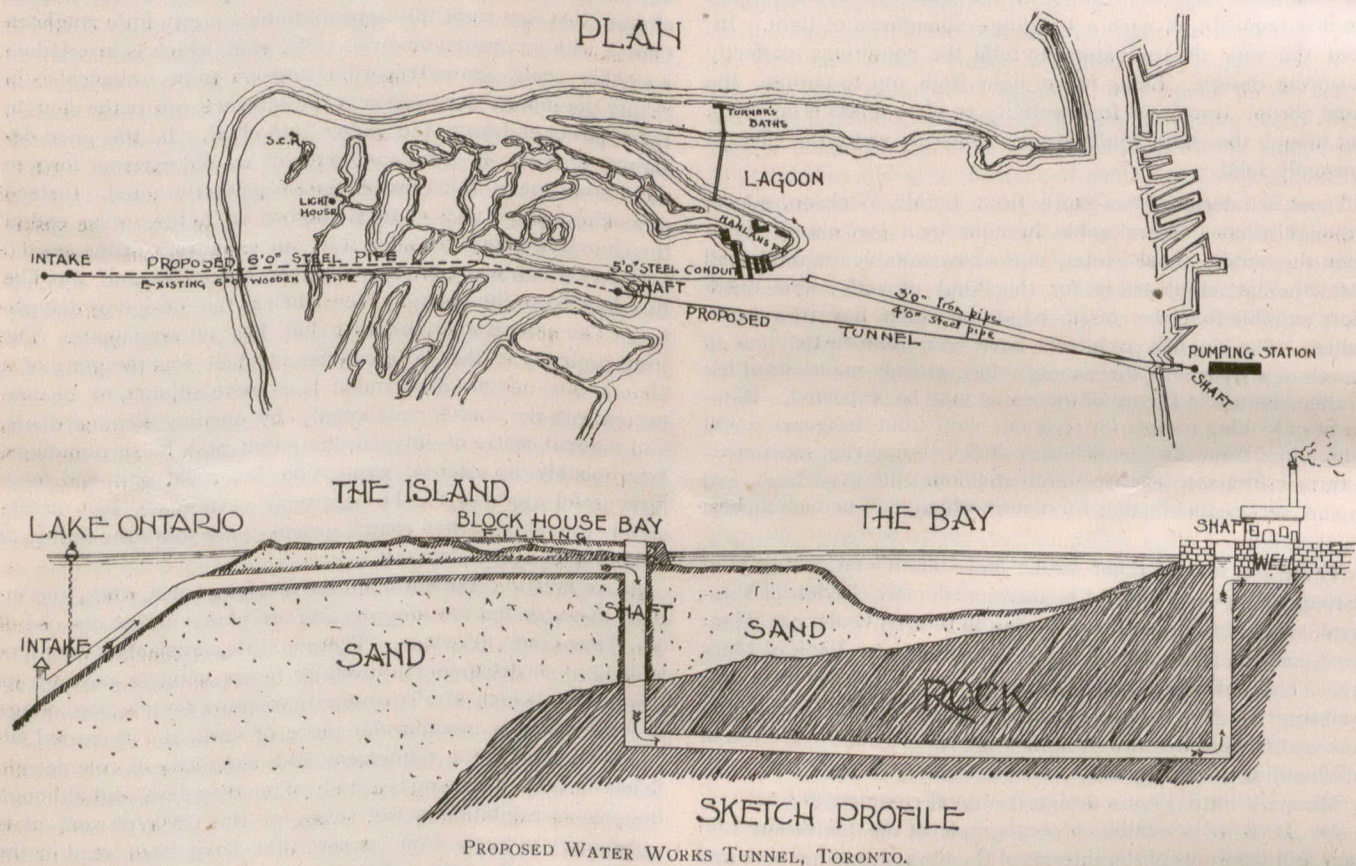
So far as Toronto is concerned, her citizens will have a large interest in the proposed water works tunnel, an illustration of which is here given. The question of pure drinking water is one that calls for the best consideration of the people of every municipality, for it has been thoroughly established, and Toronto has had some bitter experience in this respect, that drinking water may be made the vehicle for conveying some of the worst forms of contagious disease.

How to remove the constant defects that have occurred in the Toronto Water Works system, has been a serious question with aldermen, City Engineer, and most thoughtful citizens, for years. The construction of a tunnel, as is now proposed, will, it is believed, prove a solution to these difficulties, and in the building of this tunnel, readers of the CANADIAN ARCHITECT AND BUILDER, whether residents of Toronto or not, will have a practical interest from an engineering standpoint.

As shown in the illustration, a shaft will be sunk at the pumping station of the Water Works, Toronto, to a depth of, at least,

largely in recent years that the difficulties common in projects of the kind a quarter of a century ago are altogether unknown to-day. What with the compressed air rock-drills, steam and electric rock-drills, and the employment of high explosives, almost any reasonable scheme of tunnelling or excavation can be easily and successfully carried through. So important have been the developments in engineering science, that it is said a famous engineer once declared that he would undertake to tunnel straight through the earth from New York to Pekin, if the necessary capital would only be forthcoming. And yet, it is worth remembering that one needs only to go back 25 years to find that all tunnelling was done with hand-drills and gun-powder blasting. In the Toronto Water Works tunnel compressed air-drills will be used, and the nature of the rock at a depth of 128 feet having been examined, a sample of which is to be seen at the office of the City Engineer, this officer believes the way is clear for an easy completion of the work, when once entered upon.

The first important sub-aqueous tunnel was that under the



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100 feet, and it may be found necessary to go from 25 to 50 feet deeper. The diameter of the shaft will be 10 feet. Across at the Island, at what is familiarly known as Block House Bay, a second shaft of the same depth will be sunk. The length of the tunnel will, in round figures, be 6,000 feet, and 6½ feet diameter, running clear through the rock that is struck below. This rock partakes largely of the character of shale, but at the depth named is found to be of a very rock-like nature, hard and durable. The shale seams run parallel with the proposed tunnel, so that no trouble, or caving in, is anticipated in the construction of the work.

Commencing again about 11 feet down in the second shaft, a steel pipe will be extended along to the intake, connecting there with another pipe, which, if the by-law is sanctioned by the people, will also be of steel. The pipe will be laid on a very slight incline, entering the intake at a depth of about 12 feet below the surface, and representing very much the appearance of water in a glass tube. The cost of the proposed steel pipe in the horse shoe shape, going into the intake, will be \$75,000, and whilst its construction does not necessarily depend on the construction of the tunnel, yet it will form part of that work if the entire scheme is endorsed by the people. The total cost of the entire tunnel, including the new intake pipe, will be \$525,000, and will be made to provide for the requirements of a city of 700,000 population.

The methods employed in tunnel building have changed so

largely in recent years that the difficulties common in projects of the kind a quarter of a century ago are altogether unknown to-day. It is believed that the Toronto tunnel can be completed inside of 18 months. Under the St. Clair there is a tunnel 6,050 feet long; under the Severn, one over four miles long, and the Mersey tunnel is 23,615 feet long, all completed within a reasonable period, so that it will be seen there has been good progress made in the construction of sub-aqueous tunnels, as well as in other directions of tunnel building, of late years.

Besides, in arriving at a correct estimate of the time for building the proposed tunnel, Toronto's Engineer has also other experience to guide him in arriving closely at the cost of the work. He has only to cross the lake to Rochester, N. Y., and there secure data of the cost and methods of building a tunnel of a similar character to that proposed by Toronto. Milwaukee also turns in its experience, whilst information is readily secured from other cities and municipalities.

In the building of the two shafts of the Toronto tunnel, either brick or concrete will be used. The latter would probably be the cheaper, but if, in its use, it should be found that defects showed themselves, then the resort would be to brick. The leading idea of the plan is to give Toronto a permanent work and after the amount of temporizing, at a terrible cost to its citizens, that has been indulged in, it seems reasonable to suppose that they would welcome something of a more enduring nature.