

puts in the foundations and they are not of the requirements, the builder of the engine will be very ready to blame any defect of the machinery on the foundation.

I also think regarding turbine pumps, that they are in their experimental stage at the present time. However, I believe it is only a matter of a short time that they will take the place of the reciprocating engine in use now. They are doing it in other classes of pumps and there is no question but that they will be able to handle the pumping engine station requirements satisfactorily. Whether the efficiency will be much lower in actual operation, the question remains yet to be proven. However, the repairs to a reciprocating engine would have to be taken into consideration and where you get 90% efficiency from a reciprocating engine, you have a depreciation of 10% in the engine and cost of repairs 5%, but with the turbine engine that would no doubt counteract its low efficiency. There is also a question of superheating of the jackets. I think in actual tests of the steam jacket, the efficiency runs from 1% to 5% of the efficiency of the engine. But a great many do not look farther than the actual jacket of the engine. Some builders claim there is a saving of 30% and some claim there is no saving at all. Mr. Holey, of the Holey Pump Works, says it has got to be proven to him that there is a saving. Now taking superheated steam into consideration, while you get a greater efficiency, yet the cost is much higher. Of course you only take one to show the big saving, but if you took two, the percentage would be cut down considerable.

I do not know that I can say anything further. I am only interested in smaller pumping plants, and in railroad service, anything is good enough for a pump. It does not matter the size of it as long as it is good enough to do that particular station, but I think all the railroads are getting away from that idea now. They are commencing to consider that there is a certain amount of leakage that is not dripping out of the bottom of the tank. I hope in the near future they will be figuring on the same efficiency for their pumping stations as Mr. Walsh has told us about for the city of Toronto pumping station.

I thank Mr. Walsh for his paper. It has been very interesting, and if the Aldermen will let him handle the pumping station as well as he has handled to-night's paper, they will be doing well.

Mr. Latour,—

I have listened to Mr. Walsh's paper with great attention to-night. I think everybody will agree with me that this paper is the result of long practice and study.