

differences between the two sources about twenty feet.

The objections to Mr. Lougard's plan are several:

1st. It will not deliver the water sufficiently high to be effective for fire purposes in the upper parts of the city—the only portion on which sufficient head cannot be obtained from Long Lake.

2nd. It will necessitate the laying down of an independent system of pipes through every district brought within its influence.

3rd. To prevent the water from freezing in the winter time, a continual draught through the pipes would have to be provided for unless they were laid much deeper under the surface than those of the present works, and to do so at all points both with the mains, and the distribution pipes in crossing and running parallel with sewers, &c., would be exceedingly expensive.

4th. As the pipes of the system would only be brought into active use on the occurrence of fires, there would be liability of their being put of order.

And 5th. The cost would be very considerable, as the mains and distribution pipes for fire purposes must be of large size.

Alderman Pugsley proposes to lay a system of pipes expressly for fire purposes, to get effective head by pumping up water by steam power,—to be always kept in readiness on an alarm of fire being given—into a stand-pipe, one hundred or more feet in height.

The water he originally proposed to take from one of the two 12-inch pipes entering the city. This however, would only afford a sufficient quantity for supplying five jets, throwing one hundred gallons per minute, and would cut off the water from the district supplied by it. To render the plan effective without interfering with the ordinary supply, a new pipe would have to be laid from the Lake to St. Andrew's Cross, or to wherever the steam power is applied. A pipe eighteen inches diameter on the line of the present mains will discharge sufficient water, after allowing one-third for leakage and waste at the fire-plugs, to supply ten jets throwing one hundred gallons per minute each.

That effective head could be obtained by this plan there is no doubt, but there are some practical objections to it of a serious nature. There would be more or less delay in getting the steam up and pressure on the pipes after an alarm was given, and the fire meanwhile might get under such headway as to be difficult to get under. One bucket of water at the commencement of a fire is

worth thousands of gallons after it has got under way. It is true Alderman Pugsley's scheme provides for a telegraph to the Engine House, and contemplates always keeping steam in the boilers, but, unavoidable delays would occur in communicating with the telegraph station and in getting the Engine in motion.

The water would leak or drain out of the pipes, and if once empty it would be necessary to open the several blow-offs to let the air escape before they could be filled again. To fill the present pipes from the Lakes requires from two to two and a half hours with the blowcocks open, and if they were not opened it would probably require a whole day. On the other hand if the pipes were kept full during the cold of winter, without a continuous current passing through them, the water would be liable to freeze. The only safe plan would be to provide for such leakage and current by continuous pumping—but this again would add largely to the expense of maintenance.

A preferable plan in my opinion would be to pump into a reservoir on Shaffroth's Hill; the reservoir being of sufficient capacity to hold water to supply waste and leakage and furnish all that could be required in cases of fire for 48 hours. The expense attending the working of the engine would be less in pumping into a reservoir than in keeping the same engine always ready to pump into a stand-pipe. In the first case, by pumping only during the day one set of hands would be sufficient and there would always be water in the reservoir and pipes to draw from. In the second case, two sets of hands would be required—one for the night and one for the day time.

An estimate for pumping into a reservoir on Shaffroth's Hill, will be presented, having reference to supplying the upper parts of the city, and which could also be used to give additional head in cases of fire.

Other plans have been suggested, having reference to increasing the general supply for domestic use as well as for extinguishing fires, but before discussing them it will be proper to determine the quantity of water that will be required, or advisable to introduce, keeping in view an increase of population and extension of the city.

It has ever been found that where places are poorly supplied with water and each individual family are put to labour or expense in procuring it, the quantity consumed is comparatively small, but where the supply is abundant and the convenience of having it in the houses exist—the consumption, and