

From observations made when sounding Port Colborne Harbor, and from the information obtained there, it appears certain that the mitre sill of the present lock is at least one foot too high. On several successive days of calm weather last fall there was only a little over 12 feet on the sill, whilst a slight wind off shore would lower the water suddenly 5 or 6 inches.

In the month of October last there were 11 days on which the register kept by the Lockmaster shewed less than 12 feet on this sill, when his usual measurement was taken at noon of each day. There were also 12 other days in the same month when the depth did not exceed 12 feet 3 inches. This shows conclusively that the mitre sill of the Port Colborne Lock should be lowered at least one foot to admit of a twelve foot navigation. It is to be remarked, however, that last fall the level of Lake Erie was very low.

The level of the floor of the present aqueduct at Welland is 1.47 feet higher than that of the mitre sill at Port Colborne. If this floor were removed, the backs of the arches would be about level with the sill referred to. But it has been shewn that the latter is at least one foot too high, and it would be well to give the bottom of the enlarged canal a slight inclination northward in order to ensure the full delivery of the necessary supply of water for both lines at the lower end.

Even were the floor of the aqueduct made low enough to give the required depth of 12 feet, it is evident that when the summit is reduced to Lake Erie level the structure would not afford sufficient area to pass the water required for both canals except at such velocity as would prove an obstruction to the navigation.

It will therefore be necessary to construct a channel for the supply of this volume, alongside of the present canal.

The above description will, I trust, draw attention to all the chief points connected with the enlargement between Thorold and Port Colborne. The whole of the traverses and triangulated parts of the surveys were checked on a base line measured between Lakes Erie and Ontario, having a total length of over 23 miles.

From the junction of the feeder with the main line of canal to the Port Maitland branch at Stromness, a survey line was run and levels taken. The results show that the distance between these points is nearly 16½ miles; and the average cutting for a canal to Lake Erie level would be a little over 21 feet.

The country traversed by the feeder is very flat, and the borings taken at several points along it shewed a surface deposit of from 3 to 4 feet of peat or vegetable mould, underlying which blue clay was found in every case.

At the branch to Port Maitland, Broad Creek crosses the feeder. This creek was roughly surveyed, and borings taken in its bed for about three quarters of a mile in the direction of the Grand River, into which it flows about two miles above Port Maitland. These soundings shewed no rock—nothing but mud and stiff clay down to and below the bottom line of the projected canal.