

Lowest level recorded by the tide gauge.....	81.07
Surface of mud beach in front of the wharf; at much the same level as at the other wharves along the water front.....	80.00

*Cumberland Basin.*—An excellent datum for reference in this region was established during the surveys for the Baie Verte canal, in 1870; and the same datum was adopted for the Chignecto Marine Transport railway, which was never completed. These schemes were both intended to connect the navigation in Northumberland strait with the head of the Bay of Fundy for through transportation.

The datum is defined by the level reached by the Saxby tide which occurred in the autumn before the surveys of 1870. It occurred at 1 a.m. on October 5, 1869, and was an exceptional storm tide which flooded the country, as the extensive dyked marshes in this region cover many square miles. The datum is defined as 100.00 feet below this extreme level; that is, the height reached by this exceptional tide is taken as elevation 100.00 in the system of levelling. This datum is an unusually valuable one, as simultaneous tidal observations were obtained during five months in the season of 1870 at Cumberland Basin and at Baie Verte on the two sides of the isthmus of Chignecto, which are both reduced to this same datum. They thus afford a comparison between a tide with 7 feet range on the one side of the isthmus and nearly 50 feet range on the other. The observations consisted of levels only, the time of the tide being ignored. They were also limited to the day time, and only one High Water is obtained on each day, together with a few levels of Low Water during the course of the month. Such levels require care in their reduction to avoid misleading results; but the method of dealing with the diurnal inequality will be explained.

These observations were originally published as an Appendix to the report on the proposed Baie Verte Canal, by the Public Works department, dated April 12, 1873. They have now been republished in "Tides at the Head of the Bay of Fundy," issued by the Tidal Survey in 1916; where the data regarding the features of the tide to be deduced from them, are fully worked out.

At the southern end of the Marine Railway there is a large excavation for the terminal lock, named in the reports the Fort Lawrence dock, with an engine-house beside it for the pumping station. During the tidal observations of 1898, the Bench-marks in this vicinity, by which the Marine Railway datum is fixed, were examined. They are on masonry culverts under the railway roadbed, and with the help of the original working profiles they were located and their elevations ascertained. The stone of these culverts is of a soft nature, however; and by 1901 it had become so much weathered that the Bench-marks were difficult to find, even with the full description which was noted on the ground in 1898. Also, the difference in elevation of the two best of them, which were within half a mile of each other, was found to have altered, being apparently due to the cracking and settlement of the masonry of the culverts on which they are cut. This difference of elevation on the profiles was 3.44 feet, but in September 1898, the actual difference in level proved to be 3.41 feet; and in September 1901, it was 3.39 feet as shown by levels run three times from one to the other. Values were accordingly adopted for them to average this