

for lower low water is an inverse function of the height to which low water falls. This would not justify a principal station at New Westminster; as the variation can be ascertained for calculation purposes, and the tidal differences for high water and the half tides are constant. A similar distinction is required in the case of lower low water, in calculating slack water in First Narrows from the reference station at Sand Heads.

On the Lower St. Lawrence, between Father Point and Quebec, the variation is also very large in the difference of time for low water. It was not possible to bring the variation into any direct relation to the height of the tide. It was found to be chiefly in the period of the synodic month with the moon's phases, but requiring a large outstanding correction in relation with the moon's distance. The tides for Father Point were calculated by this double series of variables in the early years, before the harmonic constants were determined there.

In comparing the Miramichi region with St. Paul island, on the opposite sides of the Gulf of St. Lawrence, there is apparently a reversal in the diurnal inequality. This is of such a character that if the tide is followed in its actual progress, the difference in time is not constant, but varies so widely as to be practically valueless. Nevertheless, the tides at Miramichi can be deduced from St. Paul island by a constant difference, provided that it is taken as earlier, or for the preceding tide, as this reverses the alternation to which the diurnal inequality gives rise.

After entering the Gulf of St. Lawrence through Cabot strait, the tide changes its character during its progress towards Northumberland strait; and on reaching that strait, the diurnal inequality has developed to such a degree that the tide is practically under the control of the moon's declination. There are times when the difference in range between the two tides of the day is as great as the difference between springs and neaps. It is possible, however, to refer this strait to St. Paul island by means of two series of variable differences, for high and low water respectively; both series varying in accordance with the declination of the moon and alternating with its upper and lower transits. The tide tables for Pictou, in the middle of the strait, are calculated from St. Paul island by means of these differences, and the variation in the moon's declination during the 19-year cycle is also allowed for. The tides for Charlottetown are then computed from Pictou by means of differences by which allowance is next made for a variation in the period of the synodic month. On account of this double variation, Charlottetown has now been equipped as a principal station.

These will suffice as examples of variable tidal differences, as