The tidal observations of 1896 show that the south-western portion of the Gulf, south of Chaleurs Bay, requires to be divided into two regions. One of these is the open shore of the Gulf; comprising the Gulf coast of northern New Brunswick and the north coast of Prince Edward Island. This region can be referred to St. Paul Island by giving the time of the tide as *carlier* than at that station. Otherwise the difference in the time of the tide varies so widely as to be practically valueless. The other region is Northumberland Strait, in which also the time of the tide can best be referred directly or indirectly to St. Paul Island.

The difference in the time of the tide between points in Northumberland Strait and St Paul Island is not constant. The variation in the difference is chieff due to diurnal inequality in the tide which is there strongly marked; and this inequality also appears to change with the progress of the tide along the Strait. After making a long series of comparisons between points in the Strait and other ports, by means of the simultaneous observations of 1896, it was found that Pictou was the best point to select as a port of reference for this region. Pictou is centrally situated; and the change in the diurnal inequality along the Strait will be better divided, if differences are taken in the two directions from there. It will probably be found also to stand in the best relation to the tidal currents in the Strait when these come to be examined systematically.

The advantage of referring Pictou to St. Paul Island rather than to Halifax became still more evident when final results were reached. When the whole series of 275 simultaneous tides obtained in 1896 at Pictou, Halifax and St. Paul Island, were tabulated and averaged, the difference in the time of high water between Pictou and Halifax was found to range from 0 hr. 55 min. to 3 hrs. 28 min.; whereas the difference between St. Paul Island and Pictou was found to range only from 1 hr. 05 min. to 1 hr. 55 min. There is a similar variation in the difference in the time of low water, but it is less in amount. These variations can also be reduced to law, as it was ascertained that the difference varies in accordance with the declination of the moon. This enables the variation itself to be allowed for in computing tide tables.

To obtain a more extended basis for the computation of the tides in this region, further observations were taken at Pictou in 1897, from June 21st to November 30th. Unfortunately the tide gauge at St. Paul Island was out of order in that autumn, after September 16th. The further number of simultaneous tides secured, however, was 146 ; increasing the total to 421 for high water, and 412 for low water; comprising in all a period of nine months in the two seasons.

The method of dealing with the tides in Northumberland Strait, as the final outcome of the observations obtained is, therefore, to compute tide tables first for Pictou; and in this computation the leading variation in the tidal difference with St. Paul Island is allowed for. Constant differences from Pictou are then used for places lying in each direction from it, towards the two ends of the Strait; and the change in the inequality is thus so distributed as to be practically eliminated from the result. These constant differences are derived from the simultaneous observations at Souris, and at Cape Tormentine, which is as far as the tide has a marked range in its progress westward. In the western end of the Strait beyond Cape Tormentine, from Shediac to Richibucto, the rise and fall of the tide is so slight, owing to tidal interference there, that the time of high and low water is quite uncertain. The investigations made in arriving at this method, and an explanation of some anomalous features in the Gulf tides, are given in a paper contributed by me in May last to the Royal Society of Canada, entitled, "Character and Progress of the Tides in the Gulf and River St. Lawrence." They need not, therefore, be enlarged upon here.

The tide tables for St. Paul Island itself, are based at present upon a continuous tidal record during one complete year only; namely, from October, 1895, to November, 1896. This record has been submitted to harmonic analysis, and from it the tables are calculated in the Nautical Almanac office, London.

The series of variable differences in the time of the tide between Pictou and St. Paul Island, is derived from the simultaneous observations at the two places which 'extend from June to November in 1896, and from June to September in 1897; as above explained. The differences for high water and for low water were separately tabulated in draconitie months; that is, in accordance with the declination of the moon; and the mean differ hest averag water, are g guish betwe they thus gi Island tides Paul Island. found best t allow any ov constant. It will similar tides for lower tra ences or min after the mod after full and

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