

This is therefore the shortest available lunar cycle for the correct computation of tides at any standard point.

As the Gulf of St. Lawrence forms a large area which is nearly land-locked, it is of the first importance to obtain complete information regarding the tides and currents at the two main entrances which connect it with the ocean. The northern entrance by the Strait of Belle Isle is only about 10 miles wide and 40 fathoms deep, while the other opening between Cape Breton and Newfoundland, known on the charts as Cabot Strait, has a width of 60 miles and a depth over the greater part of this extent of about 250 fathoms. In comparison with these, the Strait of Canso need not be taken into account in its relation to the tides and currents of the Gulf as a whole; but with regard to these two main entrances themselves, it must not be taken for granted that their influence depends solely upon their relative dimensions. Judging by the movement of icebergs in the Strait of Belle Isle, the general opinion is that a large amount of cold water finds its way through it into the Gulf. This may be in reality a branch of the Polar current on its way south from Baffin's bay. Although this entrance to the Gulf may seem unimportant as compared to the other, it should be remembered that a current of even half a mile an hour through this Strait would admit to the Gulf a volume of cold water more than 20 times greater than the volume discharged by the River St. Lawrence.

As regards tide, however, there is little doubt that the amount entering the Gulf by the Strait of Belle Isle is relatively very small; but owing to the nature of tidal undulations, it is quite possible that its effects may be felt farther than at first sight would seem likely. In addition to this, the tide is sure to have a direct influence on the movement of the current in the Strait. It is therefore necessary to establish a tide gauge there as soon as possible. The best position will probably be at Forteau Bay, where there is a wharf and good shelter. This bay is also at the narrowest part of the Strait, where the currents can best be observed.

The main tide found in the Gulf undoubtedly enters by Cabot Strait (between Cape Breton and Newfoundland) from the general tidal wave in the Atlantic, which advances from the southeast. It is a remarkable fact that the tidal wave which enters here, does not lose itself in the great expanse of the Gulf area, but is again found with a range even greater than before in the passage between Gaspé and Anticosti, and from there continues its course, with ever increasing height, up the St. Lawrence to Quebec. This is well illustrated by the curves already recorded by the tide gauges. The progress of the tidal wave in this leading direction, must be largely due to the existence of a deep channel, which crosses the whole extent of the Gulf from Cabot Strait to the passage referred to, between Gaspé and Anticosti; and thence extends up the St. Lawrence nearly to the Saguenay. This channel thus extends for a distance of 500 miles, with an average width of 35 miles, and a continuous depth of over 150 fathoms. It is this channel which forms an avenue of least resistance for the progress of the tidal wave.

This will explain in general the reasons for the positions chosen for the tide gauges. It was evident that observations at some point in Cabot Strait would furnish a key to the situation; but the rocky cliffs on both sides, at Cape North and Cape Ray, and the rocky character and exposed situation of St. Paul Island, made it appear impracticable to place a tide gauge there. In locating the gauge on the