

Columbia the three positions above indicated will serve as reference stations for the tides and currents on the main lines of navigation. The tide gauges at these points should be erected at the same time, to obtain the relation required between the observations.

In considering where additional tide gauges are first required and where the survey of the currents should be commenced, the relative needs in the interest of shipping should be kept in view. On the Pacific coast, the currents themselves are on the whole stronger and more variable than those encountered by the same class of vessels on our eastern shores. On the main lines of navigation, however, the pilots join the vessels at the entrance to the Strait of Fuca; and the vessels thus obtain the assistance of local knowledge from the outset, for the straits and inlets of that coast. In the Gulf of St. Lawrence, which is traversed on two different routes by trans-Atlantic vessels, the captains have to navigate its whole extent of some 600 miles after making land, before they reach the pilot station at Father Point. It is therefore advisable that the credit which may be made available for the purposes of this survey, should be laid out during the coming season in completing on our eastern shores the number of tide gauges required, and commencing the survey of the currents. If these are completed this season, a corresponding outlay in the season of next year, to that now estimated for the establishment of tide gauges, would equip the Pacific coast with the gauges required to obtain a basis of reference for both tides and currents.

SURVEY OF CURRENTS.

The information obtained by means of the survey should be classed and described as (1) normal conditions; and (2) exceptional conditions and disturbing influences. The normal conditions of the Gulf of St. Lawrence during the season of navigation, are a fairly steady barometer and prevailing wind from the southwest; and some of the exceptional conditions already described may be taken as examples of disturbing influences.

Under the normal conditions then, the leading causes which produce the currents are the tides themselves and the force of the prevailing wind. It is therefore necessary that the winds and tides should be observed throughout the time that the survey of the currents is in progress. In recording the winds, Mr. Carpmel will be glad to co-operate by equipping more fully any of the present observatories where this may be necessary. This survey will also afford another direction in which the numerous meteorological observations now taken, may be utilized for the practical advantage of seamen. When all the tidal stations which we have indicated are established, there will be five in the Gulf and Lower St. Lawrence without counting Quebec. These must be maintained while the survey of the currents is being made, to furnish the tidal data required; and during that time it may also be possible to determine some of the tidal differences between the present stations with sufficient accuracy to enable one or more of the tide gauges to be removed and utilized at new positions. It is therefore most advantageous in the interests of the work as a whole, that the survey of the currents should be commenced at once. It will also prove more economical in the long run to do so; and there is the further practical advantage of obtaining as soon as possible, information which is so much needed. It is therefore advisable that this branch of the work be commenced this season.