

difference in the number of hours per week for which it could be used. The character of the tide at the Fraser River is so closely similar to the tide at Vancouver as to afford reliable data for the purpose.

These instances may serve as examples of the accessory ways in which this Survey often proves of value, in addition to its direct service to the shipping interest.

The total expenditure on the Survey during the fiscal year 1897-98, was \$3,081.45.

THE PRINCIPAL TIDAL STATIONS.

At these stations there has been little interruption of consequence in the continuity of the tidal record obtained during the year, with the exception of Forteau Bay in the Strait of Belle Isle. At that station, the cribwork on which the tide gauge stands, was found to be in a precarious condition when the station was visited in 1897, but the necessary repairs could not then be made for want of means. A number of minor improvements were made however, and the improved type of recording instrument was substituted for the former one; but in the month of November a severe storm occurred which damaged and shifted the cribwork so much, as to put the gauge out of working order. Arrangements were again made in the hope of carrying out the repairs this season, by having additional cribwork built to enclose the old crib on two sides. Levels were also needed to re-determine the datum plane after the settlement that had taken place, and the sight gauge required adjustment to this datum. A new barograph of superior make was to be substituted for the present one, and the diploscope was to be tested and adjusted if necessary, to secure accuracy in the time used at the station. This work was entrusted to Captain Douglas, R.N.R., who had superintended the erection of the tide gauge at Forteau Bay, when it was first placed there. He was also furnished with a complete outfit of instruments and fittings required to establish a secondary tidal station at Chateau Bay, which could be done while the cribwork at Forteau Bay was being built. The comparison with Chateau Bay at the outer end of the strait, by means of a few months of simultaneous observations, would be very valuable; because there are indications that the time of the tide at Forteau Bay is influenced by the outgoing tide from the Gulf of St. Lawrence. The amount of this influence could thus be ascertained and allowed for. Unfortunately however, difficulties arose which prevented the above arrangements from being carried out. An endeavour was next made to direct an officer of the Department who was then at Belle Isle, to erect the cribwork required; which would at least prevent the gauge from being carried away in the winter storms. Instructions were sent by mail; and the attempt was also made to intercept him at Tilt Cove, the nearest telegraph station, should he return by the ordinary route of travel by way of St. John's, Newfoundland, 2,120 miles to Ottawa. This endeavour also failed. Meanwhile information reached Ottawa on the 16th of August that Commander H. E. Percy-Cust, R.N., of H.M.S. "Rambler," engaged in making surveys this season in the Strait of Belle Isle, had called at Forteau Bay at the end of June, and had very kindly taken the trouble to overhaul the gauge, and to put the recording instrument in working order. The thanks of the Department are due to him for this service, which is all the more appreciated in so isolated a place, when other arrangements had failed. We were glad to forward at his request, a copy of the tidal record there obtained, for use in connection with his own surveys this season. To secure the erection of the cribwork, a description and plan was prepared for the third time, and forwarded to the tidal observer at Forteau Bay, Mr. A. Hart. The material had already been sent by the annual trip of the supply steamer from Quebec; and in September, after the pressing part of the fishing season was over, Mr. Hart was able to secure men in the locality for this work. In building the new cribwork, the tide house was levelled up, which further alters the elevation of the zero of the sight gauge. The gauge is thus again in order, but without the means of obtaining a correct datum level for the observations, while the other improvements at the station, and the comparative observations which it was hoped to obtain this season, have not been secured.

At St. Paul Island, the cribwork erected in 1893 was eaten away and partly undermined, owing to the severe exposure there. This was replaced by additional cribwork, which was built in front of it in September, under the supervision of Captain Douglas. The new work is set to butt securely against the rocky cliffs on either side;

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