gation of secondary tidal undulations undertaken by Mr. F. N. Denison, of the Meteorological staff. They went and returned safely in both cases.

In September, 1898, the whole of the original tidal record for the Pacific coast was lost in the destructive fire at New Westminster; and the copies supplied to this Department are thus the only ones that remain in existence. The record thus supplied, extends from February, 1895, to July, 1898, inclusive; with a gap of one month at each of the two stations.

The Department of Public Works has therefore applied for a duplicate set of copies to be made to replace their own originals. A request has also been received from the Hydrographer to the Admiralty for one complete year of the record at each station. It has thus become necessary to secure a duplicate of the record in some way, either by reproduction or tabulation.

From the above circumstances, it is evident that a serious risk is taken in allowing a tidal record of such value to stand over from year to year, without making the necessary tabulations and reductions, and submitting it to harmonic analysis, because of inability to meet the expenditure required. Until this is done, no permanent results are derived from it; and it would then become available as a basis for tide tables for ports on the Pacific coast.

IMPROVEMENTS IN THE TIDE TABLES FOR 1898.

Tide Tables for St. John, N.B.—These were issued for the first time for the year 1898. They are based upon the record extending from April, 1894, to May, 1896, or two full years. The earlier record which extends from December, 1892, to March, 1894, was not included; as it was uncertain whether the inlet to the tide pipes was always working freely, and the tide may not therefore be correctly recorded. After the gauge column was removed and refitted in March, 1894, the record has been quite satisfactory.

Following upon Halifax and Quebec, St. John is the third port in Canada for which full tide tables showing both the time and height of the tide, have now been prepared and issued since the Tidal Survey was begun in 1893. These tables are derived from direct observation of the tides at those ports, and although they are still based on a comparatively short record, they are incomparably better than anything previously available. The height of the tide as now given in these tables, is of much value where the rise and fall is so great as at St. John and Quebec. When the observations secured this season at the secondary stations around the Bay of Fundy are worked out, they will furnish tidal differences with reference to the St. John tides, which will extend the usefulness of these tables to this whole region.

The Lower St. Lawrence and River .- The tide tables for Father Point, the Pilot station on the Lower St. Lawrence, are computed by difference of time from Quebec. The difference in the time of high water is based upon simultaneous observations during two full years, as given by the tide gauges at the two places, and this has now been revised throughout and corrected for time errors. The difference in the time of low water has now been worked out also from simultaneous observations during one complete year. The high water difference, as already explained, has not been found to vary with any regularity in accordance with the moon's phases, that is to say, in accordance with the change in the range of the tide from springs to neaps, as might be expected in a long estuary. The low water difference is greater than the high water difference, and also varies more widely from its average value. The greatest values occur chiefly at times when the moon's perigee coincides nearly with full and change. It would thus appear that the lowest low waters take the longest to ascend the river, which accords with the theory of the progress of tidal undulations. This may afford a clue to the law which governs the variation in these differences when they are more closely worked out; so far as the variations may depend on astronomical causes, rather than on wind disturbance, which appears to have the greater influence. In the mean time the average values are used for the computation of the tide tables at Father Point. The resulting differences in standard time, are given below.

These differences were worked out in time to use them in computing the tide tables for Father Point for the season of navigation of 1898. Avera From

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