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Gaspé Basin.—The relation of the tide in Gaspé Basin to South-west Point, Anticosti, was found in 1897 from observations during six days, September 10 to 16. The moon being full on September 10, these include the spring tides. The observations were direct readings on a scale of feet, taken by myself; the water in the Basin being very smooth. The readings were at intervals of 5 or 10 minutes, to accord with the secondary undulation which was pronounced; they were taken for an hour or more at high and low water; and afterwards plotted as tide curves. The resulting comparison with the simultaneous record at South-west Point, is as follows in standard time :—

From the six most concordant values, High Water in Gaspé Basin, 58 minutes later than at South-west Point; and Low Water, 43 minutes later.

Range of tide at Gaspé Basin, from 0.77 to 0.83 of the range at South-west Point. Average of eight values obtained, 0.81.

TIDE LEVELS AND BENCH MARKS ON THE LOWER ST. LAWRENCE.

The soundings shown on charts are always reduced to the level of Low Water at ordinary spring tides; and accordingly this level of the water is usually termed the Admiralty datum. In the more recent Admiralty surveys of the Lower St. Lawrence, from Quebec to the Saguenay, care has been taken to fix or establish this datum level, by referring it to a permanent Bench-mark. In this Survey also, the tide levels in our principal harbours as well as at the more important summer stations, are referred to permanent Bench-marks.

It may be excusable to emphasize the primary importance of Bench-marks in maritime matters, as well as for reference in the construction of harbour works; as this does not seem to be as fully appreciated by mariners and ship owners as it deserves to be. This will be best understood by considering the difficulty of re-determining the low water datum when it is not so recorded; and the uncertainty at best, in the result arrived at. But when the level of Low Water, as originally decided upon for the soundings on the chart, is once fixed with reference to a Bench-mark, it is always possible to ascertain whether exceptional tides fall below this datum level, and so reduce the soundings given. Questions relating to the grounding of vessels at low tide can thus be satisfactorily investigated. Any changes in the depths on shoals, or in their position and extent, can be correctly followed. Tidal observations taken at any later date can be reduced to the datum level of the chart itself, and the rise of the tide as given in a tide table will then show the draught available for vessels in addition to the chart soundings.

In placing wharf scales for the tide gauges erected last season, instrumental levels were taken to determine the height of the zero of the scale with relation to the Admiralty Bench-mark and datum. These levels were always taken in two series, the one as a check upon the other, and the accuracy of the result was always within 0.01 of a foot in height.

If there were continuous levels along the St. Lawrence to connect these different Bench-marks, the tide levels could all be referred to one uniform datum. This would be of special interest in so large an estuary, which may fairly be considered as extending to Point de Monts, and thus to have a total length of 230 miles. It would then be possible to follow satisfactorily the actual levels of high and low water in their progress up the estuary, and the effect of storms in raising or lowering them.

The geodetic levels taken by Mr. Steckel, C.E., of the Department of Public Works, when they are worked out, will furnish a basis from which to obtain this result, and the tidal records now secured will then have additional interest from a physical point of view.

For the present we have adopted for the tide levels, an arbitrary vertical scale with its zero at 100.00 feet below the Bench-mark in each locality. This method avoids negative values, and this gives in the most convenient manner the true relative heights of all tide levels, including the datum itself.

It is to be noted that the storms which occurred during the season did not lower the low waters below their normal level, as their effect was to raise the water level as

Duration of Flood stream.	Duration of Ebb stream.
h. m.	h. m.
5 00	7 30
5 00	7 25
5 05	7 20
5 10	7 10
5 30	6 50
5 25	7 00
5 45	6 45
5 55	6 30
6 05	6 20
6 08	6 15
6 00	6 24
5 50	6 34