

This has become clear in carrying out the general method adopted for the Survey of Tides and Currents. A limited number of principal tidal stations were established at strategic points, from which the tides at a large number of harbours and ports of secondary importance are deduced by means of "tidal differences." These are differences in time, and ratios for height, by which the tides at other localities can be computed from the tide tables prepared for the principal stations, which are based upon harmonic analysis.

If the attempt is made to deduce the tide at some harbour from a principal station or port of reference at which the tide is of a different type, large errors may result. For instance, tables are published in which the tides of the whole world are referred to Brest in France, by constant differences of time; but the result for many places is quite unreliable. In the United States tide tables, some of our St. Lawrence and Gulf ports used to be referred to distant tidal stations, which resulted in errors of  $1\frac{1}{2}$  hours to 2 hours, early or late, in the time of the tide. As an example, the error in the tide at Pictou, within the Gulf, if calculated from Halifax by the use of a constant difference of time, is shown in the following table.

| Date         | Time of High Water |                  | Actual Difference | Error with Constant Difference | Remarks                          |
|--------------|--------------------|------------------|-------------------|--------------------------------|----------------------------------|
|              | Pictou<br>h. m.    | Halifax<br>h. m. |                   |                                |                                  |
| 1896, July 8 | 7 10               | 6 15             | 0 55              | - 1 24                         | Moon's declination maximum north |
| " "          | 8 21 11            | 18 02            | 3 09              | + 0 50                         |                                  |
| " "          | 9 8 02             | 6 50             | 1 12              | - 1 07                         |                                  |
| " "          | 9 22 07            | 18 55            | 3 12              | + 0 53                         |                                  |
| " "          | 10 9 00            | 7 50             | 1 10              | - 1 00                         |                                  |
| " "          | 10 23 15           | 19 30            | 3 45              | + 1 26                         | New moon                         |
| " "          | 11 9 45            | 8 35             | 1 10              | - 1 00                         |                                  |
| " "          | 11 23 57           | 20 22            | 3 35              | + 1 16                         |                                  |
| " "          | 12 10 35           | 9 15             | 1 20              | - 0 59                         |                                  |

It must not be assumed that it is the distance of a port of reference which necessarily interferes with accuracy in deducing the tide from it by means of a constant difference. It may prove quite possible to apply constants to a port of reference in