

the bore. The rise then was at the rate of 18 feet per hour for more than half an hour. The tide well was 12 inches in diameter, of rivetted iron plate; and 12 feet deep. The ground in the river bank through which it had to be sunk, was tough and stony. From the top of this tide-well, a tide column of the usual construction was carried up to the top of the wharf. The siphon was of $1\frac{1}{2}$ inch pipe, which was the largest size that could be had there. The inner leg was vertical and passed down inside the tide-well nearly to the bottom, to allow some margin for the deposit of mud there. With these sizes of pipe, there was still room for the tide-float of six inches in diameter to work freely. The outer leg of the siphon formed a long incline extending 55 feet to the channel of the river. The bend of the siphon passed through the side of the tide-well at two feet below the top, and at the summit an air cock was placed to allow any air to escape, while it was completely covered by the tide. For this purpose a ball-cock was used, made to remain open when covered; and to close when the tide fell to its level, before it fell to the bend of the siphon. In this way the ball-cock worked automatically, but from the excessive muddiness of the water there was so much deposit on the valve-seat that it did not close properly when left open for so long at a time. It had, therefore, to be re-arranged to open by hand by means of a chain extending to the top of the wharf. This was repeatedly tampered with, by unemployed persons who frequented the wharf, and the chain had to be boxed in completely for its whole height. At the outer end of the siphon, the water in the river was so shallow that cover could not be secured for it at all tides. The end of the siphon was therefore let into a cask to form a terminal well, and its level was carefully adjusted with relation to the bottom of the tide-well to keep the siphon from "breaking." This cask was bolted to a platform of planks, heavily ballasted to enable it to withstand the force of the bore. The front of the bore was almost always high enough to cover the cask over at once, so that the time of arrival of the bore was thus recorded on the gauge. With these arrangements the siphoning worked quite satisfactorily.

This was the only trial made of the method of siphoning during this season. If either of the above methods were to be used on a more extensive scale, the work should be begun earlier in the season to obtain full advantage of the expenditure upon them; as they would not be likely to last through the winter for use another year. During this season the record obtained at the stations towards the head of the bay, was accordingly limited to the upper part of the tide.

In Minas Basin, the upper end of Cobequid Bay is cut off at low water by sand bars. The water is thus ponded in, and it does not fall to the true level of low water. Hence, although the highest tides make themselves felt nearly to Truro, the full range of the tide cannot be obtained above Noel Bay, which is 22 miles below. In this end of Cobequid Bay the level of low water, according to the chart, is eighteen feet above true low water.

The same remark applies to the Avon River, below Windsor. The bars across it form, at low water, a series of partial dams which pond the water in, in steps. Although there is still some depth at low water around bridge piers at Windsor, this does not represent the true low tide level. Accordingly, the furthest points for which the Admiralty Establishments and the range of the tide are given, are Horton Bluff at the mouth of the Avon, and Noel Bay.

The Petitcodiac River at the head of Chignecto Bay, is more truly an estuary. As far up as Moncton, the tide continues to fall at a slow rate, up to the moment that the rising tide arrives as a bore. Yet at low water there is a water-slope all the way up from the mouth of the river. Accordingly, at Grindstone Creek, four miles below Moncton, the level of low water is about twelve feet higher than at the mouth of the river, as noted on the chart. The lower part of the tide is thus cut off by that amount. The spring range at Moncton is given in the Admiralty list as 47 feet; but this is purely theoretical, as the actual rise at spring tides, from the level to which the water falls in the river, is only 30 feet. The three points, therefore, at which the extreme range of the tide can best be measured, are in Cumberland Basin; and at Horton Bluff and Noel Bay in Minas Basin. We will give figures for these ranges, further on.

Choice of Tidal Stations in the upper part of the Bay of Fundy.—In the choice of stations in this region, the above conditions had to be taken into consideration, and also