

the greatest direct advantage to navigation. In Minas Basin the two points of most importance in these circumstances were Parrsboro and Windsor. In the other arm of the bay, Hopewell Cape and Moncton were chosen. The gauge at Parrsboro is at Parrsboro Pier, beside Partridge Island; and there is an Establishment determined at West Bay, on the other side of Partridge Island, within two miles of the pier. Before deciding upon Windsor, the neighbouring coast was examined, as far as Kingsport; but there proved to be no wharf or bridge pier at which low water could be obtained. The choice thus fell to Windsor itself as the most important point. In Cumberland Basin at the head of Chignecto Bay, some tidal observations for the level of high and low water have been taken at the end of the proposed Ship Railway, but the Establishment in that basin is determined at Sackville. In the other branch of Chignecto Bay there is an Establishment at Folly Point which shows that the time of the tide differs only six minutes with Cumberland Basin. Hence either branch of the bay will serve the purpose in view. At Folly Point the cliffs are not suitable for the attachment of a tide gauge; and Hopewell Cape, which is directly opposite, was chosen as affording the best local facilities. Moncton may be considered as the extreme head of the Bay of Fundy; and it is hoped that the time of arrival of the bore there, which is a well marked moment, may throw some light upon the progress of the tide throughout the Bay of Fundy as a whole.

Next in importance to these as tidal stations, Noel Bay may be mentioned, being the point at which the greatest range of tide is found; and Herring Cove, a point on the New Brunswick coast directly opposite Cape Chignecto, where a breakwater is now being erected. A station in this vicinity would divide the distance between St. John and the head of the Bay of Fundy. These points can only be reached by stage, and the delay in receiving the last of the recording instruments from the makers, did not admit of time being found to place gauges there without neglect of the other stations.

Equipment of the Tidal Stations, and Description of the Stations Established.—

The instrument used to record the tide at most of the stations is the Richard self-registering gauge. It is of a small size and simple in construction. It was placed for protection in a shelter box with a zinc cover, which was set on top of the tide column in which a float rose and fell with the tide to actuate the instrument. The scale gives a range of 16 feet; but as this was insufficient even for the upper half of the tide at most places, a wheel or tide pulley of double the diameter was attached to the instrument, to give twice the range on the height of the tide sheet. The score of this wheel was turned to the exact diameter required when the thickness of the cord was taken into account. This cord was attached to the tide float at one end, and after passing over the tide pulley which it turned by friction only, it was attached to a counter weight at the other end. The cord for the purpose was carefully selected; as a cord of galvanized iron used in previous seasons was so stiff as to throw itself off the wheel, and it was not durable in sea-water. A flexible copper cord was therefore used, made up of the finest wire. The float was of sheet zinc, six inches in diameter, ballasted with shot. The tide column was usually 10 inches square inside, and made of $1\frac{1}{2}$ inch board, planed on the inside. Sometimes tongue-and-groove sheathing was used, or such other material as could be obtained in the locality. The column required to have some strength, as the faces of the wharves were seldom truly vertical, and it could only be supported at intervals; and in pile wharves, it had to be braced between the piles or from their walings. For the upper part of the bay, a small cistern or pan was placed in the bottom of the tide column, below the level of the inlet; so that when the tide left the foot of the column, the tide float remained floating in it, without upsetting.

At Yarmouth and Digby the recording instruments were of the larger type designed by myself for the principal tidal stations. These were used because of delay in receiving the last two Richard gauges from the makers, and because it is hoped that the observations at Yarmouth can be continued throughout the winter. These gauges are provided with interchangeable gearing, which enables them to be set for a range of 9, 18, 27 or 36 feet, with a tide sheet of nine inches in height for all these scales. This was a convenience, while on the other hand a good deal of special planning was required in fitting up these larger instruments. The arrangements adopted to meet the special requirements, it will not be necessary to describe in detail, however.

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