

feet four inches lower than Mr. Burpee's reference point. From this I deduce that the south-west corner of the west pier of the bridge is forty-one feet six inches above mean sea-level at St. John; and that on August 9th the mean water level at Fredericton was fourteen feet four inches above the mean sea level at St. John. These figures may be of some future use for reference, and they are given for what they may be considered worth. Exception may be taken to the use of railway levellings for such a purpose, but other data are not to be had at present. I am indebted to Dr. Harrison, of the University of New Brunswick, for Mr. Burpee's figures.

V. TIDE GAUGE USED.

For the purpose of the following work I used a self-recording tide gauge of a simple type designed by myself and made with the assistance of Mr. H. White of Fredericton. As a description may be of use to others I give the following brief account of it. It consisted of a float to rise and fall with the water and a vertical drum driven by a clock, the parts being so arranged that a pencil attached to the float traced a curve on a sheet of paper wrapped around the rotating drum. The details and dimensions were as follows:

The float consisted of a cylindrical can plain at the top and with a conical lower end, the lower end being loaded with shot to give the float greater stability in the water. The diameter of the can was five inches and its length without the conical end five inches, with the conical end seven and a half inches. A brass tube was soldered axially through the can. Through the tube a brass rod passed loosely so that the float might slide up and down the rod as an axis. This axis was clamped in the frame-work of the machine, so that it might be removed and cleaned. Above the rod came the rotating drum, a cylinder of wood twelve inches long and three inches in diameter. The upper end of this made friction connection with a spring clock by means of a small axial rod fastened to a brass plate which was screwed to the wooden drum. The lower