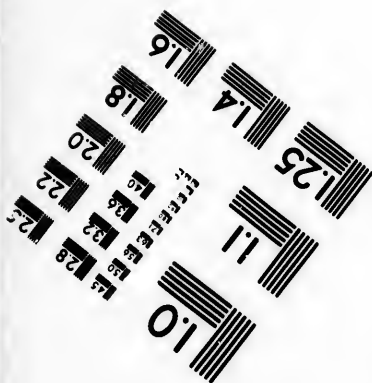
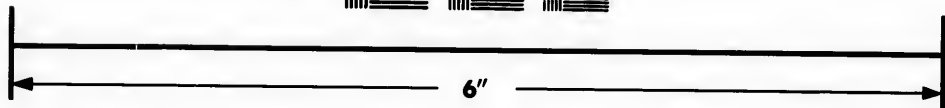
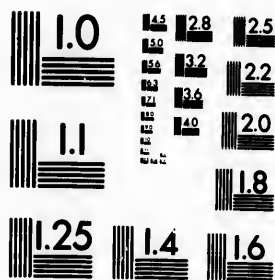


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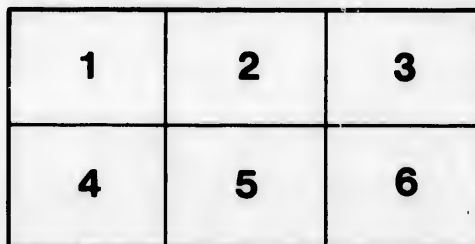
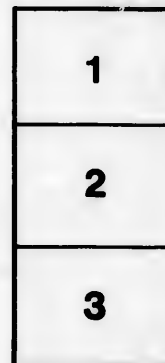
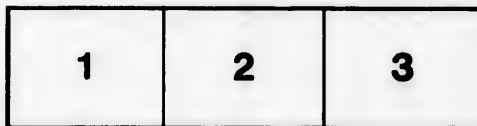
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REPORT
OF A
COMMITTEE OF THE FREDERICTON ATHENEUM
UPON THE SUBJECT OF THE
TIDES OF THE BAY OF FUNDY.

(Printed by order of the Society.)

THE subject of Tides has, of late years, been accounted one of great interest, and civilized states possessed of a commercial marine have had careful observations made upon the tidal phenomena of their respective coasts. These investigations have been prompted, not only by the spirit of prudence, which seeks to remove every obstacle or uncertainty from the path of commerce; but also by the spirit of science, which seeks to extend the limits of truth, and to comprehend the course and character of all the changes and movements affecting the surface of our planetary globe.

By a minute comparison and discussion of hundreds of thousands of observations made upon the tidal phenomena, maps have been constructed, which exhibit to the eye the course and movement of the general tide wave, in its progress from the great ocean along the shores of the continents and islands which it encounters.

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But, although it is well known that the Bay of Fundy—from its form and aspect—from its connection with the Gulf Stream—and from its relation to the Gulf of Saint Lawrence, presents a field of observation for the tides which is surpassed in interest by no other body of water in the world; and although its tides have been constantly referred to as having a greater range than all others; and while their extent and danger have been exaggerated in no small degree; it is a matter of surprise that no special survey and report upon these remarkable tides have ever yet been made public. In fact, the want of some official and exact statement as to the character of the Bay, has done this country much harm elsewhere. Sir J. Herschel, in his recent *Outlines of Astronomy*, and Dr. Traill, in the *Seventh Edition of the Encyclopedia Britannica*, speak of spring tides at Annapolis, in the Bay of Fundy, “of the surprising height of 120 feet.” Mr. Hugh Murray, in the *Encyclopedia of Geography*, speaks of the Annapolis tides as 45 or 50 feet; but in Mr. Brande’s recent *Dictionary of Science, &c.* they are said to be 100 feet in their range. “In the Bay of Fundy,” (according to Mr. Hughes, Head Master, Royal Naval School, Greenwich Hospital,) “there are extraordinarily high tides; a vast wave is seen for 30 miles off, approaching with a prodigious noise, sometimes rising in the Bay to the height of 100 and even 120 feet: on some occasions the rapidity of the waters is so great as to overtake animals feeding on the shores.” —(*Outlines of Physical Geography*, 1849, page 60.)

The impetuosity and the danger of these mighty tides are considered to be general throughout the Bay. Major Robinson, in his *Railway Survey*, refers to fields of floating ice hurried about by rushing tidal currents; and even Professor Johnston has seemed to countenance the idea of its best harbour being beset with ice in the winter season. And

in the "Notes explanatory of the Tidal Charts of the World, by J. Scott Russell, Esq., M.A., F.R.S., Ed., &c." which appear in the splendid "Physical Atlas, by Alexander K. Johnston, F.R.G.S.F.G.S." published at Edinburgh and London in the year 1848, and dedicated to "His Excellency, Baron Von Humboldt," the world is still informed:—"The Atlantic receives from the southern reservoir its great wave of tide, which passes northward with impetuosity, and expends its forces on the shores of Britain and North America, where again it becomes the enormous stream-tide of the Bristol Channel, and the destroying surge of the Bay of Fundi, so well known to all mariners." And again:—"From the south, in like manner, the Pacific should receive its great tide, were it not barred out by innumerable submarine steppes, and its thousand coral reefs, and its myriads of happy islands, to whose calm seas no propagation of this great horizontally-acting wave can gain access.—In the North Pacific we have neither the bores of a Hoogly, nor the terrific tides of a Bay of Fundi."

These are instances of the erroneous position which the character of the Bay of Fundy is permitted to retain in sources of scientific reference, in which at least a general accuracy is expected.

It is fortunate that in works more particularly intended for the merchant and mariner, such as M'Culloch's Geographical Dictionary, and Blunt's Coast Pilot, a more guarded, and perhaps, in the present state of our knowledge, a more correct, though very general, representation is given.

But authentic information in detail, such as is required by interested and intelligent inquirers generally, cannot be said to exist; and in view of the important object now occupying the attention of the Legislature, such information is particularly desirable. It is proposed that the Harbours of the

Bay of Fundy shall from henceforward enjoy, by means of Railways adapted to the purpose, a due share both of the winter and summer trade of Canada, and the great producing regions of the West, on the one side; as also of more direct communication with the port of Halifax, and the eastern regions of the globe, on the other. Hence it becomes at this time of peculiar importance to dissipate error and unfounded prejudice on the subject of the navigation of the Bay.

There are therefore, it will be seen, many reasons for desiring an authoritative statement as to the true character of the waters of the Bay.

We, here, are well aware that there are perhaps as few disasters in the Bay of Fundy as on most other coasts; and that, notwithstanding our much talked of summer fogs, the commerce of the port of Saint John goes on even more safely and steadily than that in the port of Boston; yet, although we are ourselves satisfied of this fact, still the idea of danger from the complication of tides 120 feet in height, rushing with race-horse velocity,—of floating fields of ice,—of frozen harbours and impenetrable fogs,—is such as seriously to injure the character of our coasts in the opinion of the world.

The publication of the hydrographical survey of the Bay of Fundy by the Imperial Government ought no doubt to correct the belief in the reality of many of those dangers; but it appears only in piece-meal and at long intervals.

We are aware that many important observations upon the tides of the Bay have been made in the course of that survey, while under the direction of Admiral Owen and Commander Shortland, as also upon those of the Gulf of Saint Lawrence during its survey by Captain Bayfield; and that tide gauges on the most improved principles have been registering for years the movement of the tidal wave along the

shores of the Bay ; but the results of these observations, however carefully deposited at the Admiralty, would seem to be at present unavailable for our purposes.

What we desire, therefore, is that these data, with such as may have been collected by our own colonial observers, and such others as are still wanting to make out the whole history of the phenomena of tides and currents within the Bay of Fundy and Gulf of Saint Lawrence, should as soon as possible be put into competent hands, to be considered, reduced and published in a compact and available form, for the use and advantage both of commerce and science.

In such a case, we would require the conjoint action of the two Provinces especially interested, not only in regard to the funds required for the service, but also to memorialize Her Majesty's Government upon the subject, so as to induce the Lords Commissioners of the Admiralty to make the tides of the Bay an early and specific object in that survey.

In order to expedite this matter, your Committee drew up and submitted to Commander Shortland a few queries upon the subject ; an extract from which, together with the answers, they beg now to bring under your consideration.

1st. What observations upon the tides have been made by the Government Survey of the Bay of Fundy ?

Answer.—Two self registering tide gauges were in operation during the years 1846 & 7—one at St. John, the other at Campo Bello ; the results obtained were forwarded to the Hydrographer, and might be obtained by application to him : other observations were also made.

2d. Supposing our knowledge of the tides of the Bay to be incomplete, what kind of observations are

still required to complete our knowledge thereof; and at what points does Commander Shortland consider such observations should be made ?

Answer.—To obtain a complete set of tide observations for the Bay of Fundy, it will be necessary to establish a self registering gauge at some fixed point, such as Saint John, to be kept constantly going as a standard, and compared with two moveable gauges; which latter ought to be at least one month in each place, and longer if found necessary upon comparison with the standard. Yarmouth, Brier Island, Quaco, Grand Manan, Digby, Basin of Mines, Cape Enrage, Isle Haute, and Cumberland Basin, appear good places for making such observations.

3d. What would be the estimate of the cost of making such observations as are still considered necessary ?

Answer.—The cost of the tide gauges will be £30 or £40; the cost of erecting each might be £100; but this greatly depends on the nature of the place. A man to take charge and attend to the gauge will be about £4 or £5 per month more.

In Commander Shortland's replies we therefore have sufficient to proceed upon; and if the want of such observations is felt, as we consider it ought to be, we would venture to suggest that the Legislatures of the Provinces of New Brunswick and Nova Scotia might, during their present Session, make an appropriation to their Lieutenant Governors respectively, of the sum of £150; at the same time praying that they would communicate with the Home Government, requesting them to move the Lords of the Admiralty to undertake the said tidal survey; and intrust to the officer in charge of the same the task of making an early and complete Report specifically

upon the Tides and Currents of the Bay of Fundy,
at all seasons of the year.

Respectfully submitted.

E. JACOB, Chairman,
J. ROBB,
W. B. JACK,
G. ROBERTS,
J. B. TOLDERVY,
J. WILKINSON,

} Committee.

Fredericton, 16th February, 1852.

