

next voyage, when, if the weather is thick, it may be found that the ship is as far to the north as she was on the previous trip to the south. It is the more difficult under these circumstances to collect evidence on the subject. He is himself convinced, however, of the extreme desirability, if not the absolute necessity of proceeding with this work as soon as possible.

During the summer season of 1889 little was done of a practical character, beyond exploratory trips made by Lieut. Gordon and Mr. Carpmael, with a view to ascertaining the best points for the establishment of tide gauges.

At the conclusion of the re-surveys in the Lower St. Lawrence with this season, the expenses of which were being shared by the Canadian Government and the British Admiralty, the time was regarded as opportune to make further representations as to the pressing need for information about our tides and currents. Accordingly, in December, 1889, a petition was addressed to the Minister of Marine and Fisheries which was drawn up by the Committee of the British Association, and the Royal Society of Canada, and was signed by 393 masters and officers of vessels, to the following effect:—

"We, the undersigned masters and officers of vessels engaged in the navigation of the Gulf of St. Lawrence and of the waters on the Atlantic coast of the Dominion of Canada and of Newfoundland, desire earnestly and respectfully to petition the Government and Parliament of Canada, that they would promptly take such steps as they may deem advisable to obtain as thorough a knowledge as possible of the currents in these waters, whether due to the tides or to any other cause, and to distribute amongst mariners the information obtained. We believe that the serious loss of life and property due to shipwrecks attributable to unknown currents during fogs or hazy weather may thus be greatly diminished. In such weather these currents are a cause of great anxiety and danger."

A further memorial was presented to the Minister by the Shipping Interest of Montreal, bearing the representative signatures of Messrs. H. and A. Allan, David Torrance & Co., H. E. Murray, Anderson McKenzie & Co., and F. W. Henshaw. This memorial points out the special deficiency in Canada of such information to mariners as is supplied by the Imperial Government in the British Tide Tables; which show not only the change in the depth of water due to rise and fall of the tide, but also supply very full information about the currents in the waters surrounding the British Islands, whether due to the action of the tides, or influenced by atmospheric causes. The annual wreck list is referred to, as showing the urgent need of similar information for Canadian waters; and as far as ascertained, ship-masters were unanimous in their anxious desire for information on the subject. The need of taking immediate action in the matter is urged, as the necessary observations will occupy some years, and every year before their completion will show its list of preventable wrecks.

This memorial was also heartily endorsed by the President of the Quebec Board of Trade. It was referred to Captain W. H. Smith, R.N.R., Chairman of the Board of Examiners of Masters and Mates, who has had thirty years' experience in the Atlantic service; and in reply he concurs in recommending that self-registering tide gauges be placed at all the prominent ports, and observations taken by competent persons.

About the same time a further communication was received from Dr. Johnson, on behalf of the Committee of the British Association, which reviews the representations already made by them. Amongst other reasons adduced, the rule of the Imperial Board of Trade is referred to. This requires all masters of ships to obtain a certificate of competency, and for this purpose to pass an examination; which examination, in the case of masters desiring a certificate for the coasting trade, includes a knowledge of the tides and tidal currents. The information enabling them to pass this examination is found in the tide tables published by the Admiralty. This is cited to show the need of obtaining data for Canadian waters on which similar information could be based. The recent re-survey of part of the Lower St. Lawrence under Staff Commander Maxwell, is also referred to; and his endeavour as far as time permitted him, to investigate the tides and currents in the part of the river in