

Tides on the British Columbia Coast.

In the investigations of the tides by the Naval Service Department's tide and current survey branch the future development of British Columbia is kept in view, and data are already given for the tides at Alberni, Port Hardy, Kiti-mat, Bella Coola and other places which may quite possibly become railway terminals in the near future. Not only is the direct interest of navigation benefited by the information published, but several important industries that are dependent on water transport, notably the lumber industry and the coal trade, which carry on their business by towing to so large an extent. Vancouver Island may be considered as an immense natural breakwater against the heavy seas of the Pacific, enclosing between itself and the mainland a series of sheltered passages and channels, which form a network of natural canals probably unrivalled anywhere in the world. This system of water communication is one of the assets of British Columbia which may not be appreciated at its full value, but this is emphasized by the constant use of these Canadian channels by United States vessels on the route from Puget Sound to Alaska.

The only difficulty in their navigation arises from the strong tidal currents met with in the various narrows, so strong that in some of them navigation is only possible at slack water. This problem the tidal survey undertook to solve and the practical outcome now obtained places navigation of all grades under a debt of obligation for its persevering efforts. The most important of these passes is the notorious Seymour Narrows, and it will interest mariners to learn in what way it is now possible to calculate correct tables for slack water there.

Observations at Seymour Narrows were obtained as long ago as 1897 by the U.S. Coast and Geodetic Survey. As a rule, the turn of a tidal current has some definite relation to the time of high and low water in the locality, but these observations showed at once that in this case no such relation could be found. The Coast Survey also failed to establish a relation with their tidal stations in Puget Sound and Alaska, because the tides there are of a different type. The Dominion Tidal Survey undertook this problem with better hope of success, as it has well-established tidal stations in British Columbia, with which to compare the complicated behavior of the currents in Seymour Narrows.

After a lengthy research the discovery was made that the turn of the current was governed by the rise and fall in the open Pacific, and now that this is known it seems quite natural, because the Pacific tide comes round both ends of Vancouver Island from the north and south. The best tidal station on the open Pacific with which to make comparison was Port Simpson.

Having thus got within sight of a solution further observations were obtained in 1910. Although there is so heavy a traffic through Seymour Narrows, the shores are uninhabited, and observers for these narrows and the Yuculta were supplied with an outfit for camping at commanding points and chronometers for accurate time. In reducing both the old and new observations, tide tables were first calculated for the back year of 1897 at Port Simpson, and the observations of 1910 were compared with the simultaneous tides there. In making the comparisons between the time of slack water and the tide, it was found necessary to distinguish the half tides from the others, but even then the results were not altogether satisfactory till a fresh discovery was made. The difference in time with the tide at Port Simpson was reasonably constant

for high water slack, but for low water the difference had to be taken with the next following tide there. This curious result is in accord with the difference in the time of the tide to the north and south of the narrows, as the difference is practically the tidal period of six hours. The data thus obtained, with a special allowance for the half tides, at last afford a satisfactory basis for the calculation of slack water, as now published in the tide tables.

This achievement has made it possible to give data for all the passes and rapids which lie along an irregular line from Seymour Narrows eastward to the mainland at the mouth of Bute Inlet. The extreme pass on that side is the Yuculta, and it was therefore chosen as the companion to Seymour Narrows in the simultaneous observations of 1910. With the two extremes, next Vancouver Island and next the mainland, it became possible to deduce data for all the intermediate passes. For the time of slack water in these, in relation to the principal narrows, is known to many of the captains of the tugs and coasting steamers who use them, and this information has now been brought into practical shape, and is published this year for the first time in the tide tables.

A knowledge of the time of slack water in such narrows as Okisollo, Well-bore, Green Point rapids and others, is of substantial value to the lumber industry especially, as the most powerful tugs with a tow of logs can only attempt such places at slack water. These passes are in frequent use also by coasting steamers for a rapidly increasing traffic.

These additions in the new tide tables make them very complete, as slack water tables are already published for Active Pass, Porlier Pass and First Narrows, on the routes from Victoria and Nanaimo to the mainland, and the tides at the most important harbors in the province are fully given. It is to be hoped that all mariners will take advantage of these, as they are quite superior in accuracy to anything heretofore available.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

23. Apr. 24. 62. Quebec, Gulf of St. Lawrence, Gaspé Bay, Gaspé basin, buoys discontinued. 63. Quebec, River St. Lawrence, Cap Brule, main light to be moved to the front range lighthouse.
24. Apr. 25. 64. Ontario, Lake Erie, Port Colborne, light on eastern breakwater temporarily discontinued.
25. Apr. 25. 65. New Brunswick, Bay of Fundy, Machias, Seal island, westerly light permanently discontinued. 66. New Brunswick, St. Croix river, buoy established east of Docket island. 67. New Brunswick, south coast, Bay of Fundy, off Negro head, submarine bells not in operation. 68. Nova Scotia, south coast, Green bay, Green ledge, bell buoy established. 69. Nova Scotia, Cape Breton island, Lennox passage, buoy established east of Dog island. 70. Nova Scotia, Cape Breton island, east coast, Glace Bay, Glace cove, change in position of storm signal mast.
26. Apr. 27. 72. Prince Edward Island, Northumberland strait, West point wharf, range lights established. 73. Quebec, Gulf of St. Lawrence, Little Natashkwan harbor, uncharted reef, buoy established, wharf built.
27. Apr. 30. 74. British Columbia, Strait of Georgia, Burrard inlet, Atkinson point, new lighthouse and fog alarm under construction. 75. British Columbia, Burrard inlet, First narrows, echo boards established. 76. British Columbia, Dixon entrance, non-existence of reported shoal.
28. May 7. 77. British Columbia, Strait of Georgia, sandheads of Fraser river, advertised change in positions of

gas and whistling buoy and lightship, not made.

29. May 8. 78. Ontario, River St. Lawrence, Lake St. Francis, Lancaster light station, hand fog horn discontinued. 79. Ontario, St. Clair river, Sarnia, barge established to mark wreck. 80. Ontario, Lake Huron, north channel, Manitoulin island, Little Current, description of dredged channel. 81. United States of America, Detroit river, changes in Grosse Isle south channel range lights. 82. United States of America, Detroit river, change in Ecorse back range light.
30. May 10. 83. Nova Scotia, Cape Breton island, east coast, Scatarie island, Mainadieu, intended change in character of light. 84. Quebec, entrance to the St. Lawrence, survey steamer, engaged in the investigation of currents, to be avoided. 85. Quebec, Saguenay river, change in position of buoy above Riviere Lachance.

31. May 11. 86. British Columbia, William Head, Alberni, and Prince Rupert, quarantine regulations.

32. May 14. 87. Gulf of St. Lawrence and Atlantic coast, corrections to telegraph chart in reference to ocean cables. 88. Nova Scotia, south coast, Cross island, intended change in character of light. 89. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Lake St. Peter, gas buoy at no. 3 curve, change in color of light.

33. May 15. 90. Ontario, Lake Ontario, South Bay point, light again in operation. 91. Ontario, Lake Huron, Port Elgin, change in position of front light of south range, daymarks established.

34. May 18. 92. Ontario, St. Clair River, Sarnia, wreck of steamer Joliet being removed, caution.

35. May 18. 93. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, lightship removed, gas and whistling buoy replaced in position.

The Heathcote-Malmstad Collision.

Following is a summary of the judgment delivered Apr. 26 by L. A. Demers Wreck Commissioner, and concurred in by Capt. R. MacDonald, North Sydney, N.S., and Capt. N. H. Townsend, Port Warden, of Sydney N.S., re the collision between the s.s. Heathcote, owned by the Dominion Coal Co., and the s.s. Malmstad, under charter to the same company, in Louisbourg harbor, N.S., Mar. 20.

The court finds that the Malmstad occupied what is considered the proper anchorage, and that its position did not obstruct the range lights which serve as a guide for the passage between White rock and Battery shoal. A proper watch was kept and the regulation lights were burning, and when the collision seemed imminent, chain was promptly paid out, this being the only practical alternative for the anchored vessel. Regarding the Heathcote, it is evident that with an extremely limited draught forward, she was carried rapidly to leeward by the prevailing winds, and insufficient allowance was made therefor, and the court holds that the master of the Heathcote acted imprudently and showed lack of judgment in navigating his vessel as he did under the conditions existing. All examinations of the Heathcote's logs disclose their incompleteness in recording the details of the circumstances preceding and attending the collision. In view of the facts, the court exonerates the master and officers of the Malmstad from responsibility for the collision and finds that Capt. Alex. Muir of the s.s. Heathcote committed a grave error of judgment in attempting to cross the bow of the Malmstad in the manner he did, for which he is severely censured and cautioned to exercise more prudence and discretion in future.