

A more recent extension of the shore direction finder is the development of the direction-finding instrument on board ship. To assist this development, the Department has established radio beacon transmitters at a number of lighthouses and lightships (see Table 69). These radio beacons transmit characteristic radio signals with an approximate range of 50 miles every hour at advertised times during clear weather and continuously when the atmosphere in the vicinity of the station is so obscure as to impede navigation. Ships fitted with their own direction finding instruments are thus enabled to take their own bearings from these radio beacon stations. All radio beacon apparatus is now standardized and is automatic in its operation, being controlled by a clock which starts in proper sequence the gasoline engine, the generators and other associated apparatus, keeping them in operation for a predetermined period and stopping all machinery at the end of the period.

For years an international ice patrol supported and maintained by the maritime nations of the world has watched the traffic route of the North Atlantic for the purpose of reporting the presence of icebergs to passing ships by radio. Canada has her own problem in this respect—that of combatting ice which accumulates in the lower gulf of St. Lawrence prior to the opening of navigation to Quebec and Montreal each spring. For this purpose a patrol service is maintained in the gulf during the ice period each year by the ice breakers *Mikula* and *N. B. McLean* or *Montcalm*. These vessels cruise in the vicinity of Cabot straits, observing ice conditions, broadcasting a synopsis of the location and drift of ice to ships and recommending routes to be followed. The ice breakers are prepared to open up lanes through the ice when it is impossible to circumvent the ice fields by devious routes.

To insure the safety of life at sea, all passenger steamers and freighters plying to and from Canadian ports must carry radio equipment manned by competent operators in possession of a certificate of proficiency in radio. The Department maintains a complete radio inspection service to enforce this regulation. Inspectors located at various ports throughout the Dominion are responsible for checking the efficiency of the radio equipment on ships of all nationalities, and seeing that only competent operators are carried. Examinations for certificates of proficiency in radio are conducted by the Radio Branch, and 2,938 certificates have been issued up to Mar. 31, 1931.

Table 69 shows the name and situation of the Government-owned radiotelegraph stations in Canada and Newfoundland. In former editions of the Year Book licensed private commercial stations were also listed, but their increasing number renders this impossible. A list of those in operation in 1926 appears on pp. 657-658 of the 1926 Year Book, while an official list of the radio stations of Canada is published annually by the Radio Branch, Department of Marine, at 25 cents per copy, with supplements.

Table 70 gives the number of messages and words handled and the cost of maintenance for the Government stations of the east coast, the west coast, the Great Lakes, and Hudson bay and Hudson strait. For the year 1930-31, the total number of messages was 396,727, as compared with 440,912 in 1929-30, 456,239 in 1928-29, 404,144 in 1927-28 and 402,023 in 1926-27, and of words handled 8,534,982, as compared with 9,167,302 in 1929-30, 8,942,945 in 1928-29, 7,695,757 in 1927-28 and 7,347,794 in 1926-27.