

in the chains of radio signal and direction-finding stations described under radiotelegraphy at p. 883. Lists of aids to navigation, with the exception of very minor ones, are published by the Department of Transport.

### 16.—Marine Danger Signals maintained in Canada, Years Ended Mar. 31, 1949-55

Note.—In addition to the aids to navigation listed, approximately 9,300 unlighted buoys, balises, dolphins and beacons are maintained. Lists of marine danger signals maintained from 1929 are given in the corresponding table of previous Year Books beginning with the 1941 edition.

Type of Signal	1949	1950	1951	1952	1953	1954	1955
	No.	No.	No.	No.	No.	No.	No.
Lights.....	2,491	2,778	2,841	2,861	2,901	2,876	3,003
Lightships.....	8	8	8	8	7	6	7
Light-keepers.....	1,094	1,416	1,353	1,131	1,154	1,083	1,084
Fog whistles.....	11	18	22	23	24	18	19
Sirens.....	2	3	3	3	3	4	5
Diaphones.....	176	207	212	213	216	211	235
Fog bells.....	38	43	44	46	46	49	54
Hand fog horns.....	137	134	133	127	124	122	127
Hand fog bells.....	10	10	10	12	12	12	12
Lighted and combination lighted whistling and bell buoys.....	585	618	655	681	719	778	946
Whistling buoys.....	39	38	38	37	37	36	32
Bell buoys.....	113	109	110	113	112	115	117
Fog guns and bombs.....	11	11	10	9	8	9	7
Fog alarm stations only.....	11	15	15	15	15	15	17

Navigable waters have been improved greatly by dredging in channels and harbours, by the removal of obstructions, and by the building of remedial works to maintain or control water levels. Incidental to these developments of navigable waters are works to guard shorelines and prevent erosion, and for the control of roads and bridges that cross navigable channels. Ice-breaking operations are carried on at the beginning and at the end of winter to prolong the season of navigation in important waters that freeze over—particularly in connection with sea-going shipping from Montreal, Que.—and to prevent flood conditions during the spring ice break-up.

**St. Lawrence River Ship Channel.**—This channel extends from about 40 miles below Quebec City to the foot of Lachine Canal at Montreal, a distance of 200 miles. About 113 miles of this distance is dredged channel.

Above Quebec the channel has a limiting depth of 35 feet at extreme low water and a minimum width of 550 feet, with additional width up to 1,500 feet at all curves and difficult points and additional anchorage and turning areas. This section comprises about 100 miles of dredged channel. Below Quebec the limiting depth of dredged channel, about 13 miles in length, is 30 feet at low tide, with a width of 1,000 feet. An average tidal range of 15 feet in this area provides ample depth for any vessel using the St. Lawrence route. Maintenance requirements owing to silting in this dredged channel are relatively minor above Quebec but below the city silting is more pronounced because of tidal action.

The ship channel is well defined by buoys, and the centre by range lights permitting uninterrupted day and night navigation throughout the open season from about mid-April to early December. The movements of all shipping, weather and ice conditions and obstructions to traffic throughout the St. Lawrence waterway from Fame Point, Que., to Kingston, Ont., are recorded and made available to all concerned through a series of reporting stations known as the Marine Reporting Service.