

tween Magdalen Island and Cape Breton Island. When this ice meets the main body flowing past Bird Rock, and closes the strait between St. Paul Island and the Newfoundland coast, northwesterly winds open the Newfoundland coast, and the strait clears quickly, so that in about 36 to 46 hours very little ice in visible quantities passes through for some period after navigation is open, particularly with north winds. Vessels not strongly built to encounter this ice are seriously impeded by encountering it, but it has been found that vessels specially strengthened for ice conditions have no difficulty in navigating.

This last condition appears to be the most serious obstacle in the operation of the St. Lawrence River during winter, but when it is considered that this condition at its worst, exists for but a short period of two weeks, at most, it is concluded that vessels encountering this obstacle can be diverted to Halifax, N.S., and St. John, N.B., and as the time that this occurs is not at a period when rail traffic is most seriously congested, the operation for the handling of traffic diverted to those ports could adequately be carried on by the present facilities afforded at those ports and lines serving same.

As an extra precaution and guard to navigation, information as to ice, wind, temperature, and weather conditions can be obtained by communication between vessels and any of the marine or signal stations in the Gulf and River St. Lawrence at Cape Ray, St. Paul Island, Magdalen Island, Anticosti, New Brunswick coast points, Gaspe coast and as far north as the Labrador coast. It is only necessary that the small additional expense of operating these stations during the winter and early spring be added to that of the summer season, and the short distances between those points of warning are an additional safeguard in that they afford sufficient time for ships

to seek shelters that are numerous, enabling them to be protected against any unusual conditions.

Investigations have shown that strandings in the Gulf and River St. Lawrence, and the approaches, including the Newfoundland coast, are not, owing to the danger of the route, but to the want of care and attention to navigation. There is a wide variation in the magnetic bearing between Belle Isle and Montreal, particularly between the first named point and Anticosti, and the frequent wrecks which occurred formerly on the eastern part of Anticosti, in foggy weather, were doubtless due to non allowance for change in variation, but such obstacles to a route should not be considered a hindrance when modern day care and navigation instruments are considered.

Snow Storms are at times severe, lasting from 24 to 48 hours. They constitute the most serious menace to navigation on the St. Lawrence River during their duration, owing to the impossibility of sight. From observation during one of these storms it was found that objects at a distance of 50 ft. were entirely obliterated. This condition can be adequately met, so as to entirely eliminate any chance of collision or groundings, by careful warning of vessels, as suggested in the meeting of the ice condition, and anchorage can be had in shelters. The most serious wrecks occurring during those snow storms have resulted from vessels anchoring in the stream, and drifting to shore, after having anchor chains cut by the floe ice. To meet this condition, two breakwaters, providing adequate shelters could be established along the river, behind which ships would be sheltered from the floe during the storms. Other recommendations have been suggested, such as guards carried by vessels for anchor chains. It is estimated that if it was found necessary to establish the breakwaters mentioned, a total investment of

\$1,000,000 would be adequate.

It would also be necessary to fit every ship coming up the river with an iron or wooden apron over the bow, and vessels so equipped become in themselves icebreakers of no mean ability. Such outfits are in use on all ships running to Russian ports, and adequately protect ships from harm.

During the past the keepers of some lighthouses have been withdrawn from service during the winter, and other river markings have been removed during the flow of ice. This practice can be discontinued and the markings made sufficiently permanent to place them above the danger resulting from the ice flow, and the expense of such works and their operation would be almost negligible when compared with the great economy effected by the handling of freight by water transportation.

It appears that in short there are no serious obstacles for the entire winter navigation of the St. Lawrence River. In all northern countries, when the average winter temperature is below the freezing point, the water becomes frozen, and attempts to continue navigation are made with great difficulty. As population increases, and demands for cheaper and more effective communication grow, the question will arise as to the feasibility of operating the waterways and harbors in Canada during the winter. This matter has been found to be of no very serious moment, except in one or two instances. Winter navigation has been maintained for many years between Prince Edward Island and the New Brunswick mainland and similar communication has been carried on with Newfoundland, but when the volume of trade grows there can be no question as to the needs of cheaper methods of transit as afforded by water. In Russia winter navigation has been found to prove feasible and many ports require icebreakers in summer to reach northern

Vessels Registered in Canada During October, 1919.

In compiling the following lists of vessels registered, steamboats and motor boats, operated by engines of less than 10 n.h.p., are eliminated, as also are sailing vessels of less than 100 tons register.

STEAM.

No.	Name	Port of Registry	Where and when built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	N.h.p.	Owners or managing owners
103690	Luckport (1)	Midland, Ont.	Midland, Ont. 1898	126.0	21.6	12.0	231	134	57	Sc.	Midland Transportation Co., Midland, Ont.
141484	Vaudreuil (2)	Montreal	Cleveland, Ohio 1889 Lauzon, Que. 1919	278.0	40.0	20.3	2514	1436	136	Sc.	C. A. Barnard, Montreal, Que.
			(1) Formerly Magnolia, a recovered wreck.								(2) Formerly, Frontenac.

(1) Formerly, Magnolia, a recovered wreck. (2) Formerly, Frontenac.

SAILING.

No.	Name	Port of Registry	Rig	Where and when built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Owner or Managing Owner.
141383	Audrey P. Brown.....	LaHave, N.S.	Schr.	Liverpool, N.S.....1919	123.4	28.9	10.8	252	218	C. H. Ritcey, M.O., La Have, N.S.
141151	C.P.R. No.6.....	Victoria, B.C.	Barge	Nelson, B.C.....1919	225.5	42.0	8.0	652	652	C.P.R. Co., Montreal.
141228	Charlotte Comeau.....	Weymouth, N.S.	Schr.	Little Brook, N.S.....1919	172.0	37.4	13.4	779	728	I. M. Comeau Shipping Co., Little Brook, N.S.
141448	Dollar VIII.....	Vancouver, B.C.	Scow	Dollarton, B.C.....1919	107.0	36.0	8.4	235	235	Canadian Robert Dollar Co., Vancouver, B.C.
141447	E. C. E. S.....	"	"	Vancouver, B.C.....1899	97.3	28.5	6.8	161	161	Evans, Coleman & Evans, Ltd., Vancouver, B.C.
141485	F. L. Heidritter.....	Montreal	Barge	Whitehall, N.Y.....1901	96.5	17.8	7.3	123	108	Richelieu Transportation Co., Montreal.
141409	Freda M. Himmel-	Lunenburg, N.S.	Schr.	Lunenburg, N.S.....1919	125.4	26.9	10.6	174	114	A. Himmelman, M.O., Lunenburg.
141095	Holmes A. Frank.....	Chatham, N.B.	"	Nordin, N.B.....1919	174.0	38.5	13.0	690	637	J. Robinson, Millerton, N.B.
141449	J. C. No. 14.....	Vancouver, B.C.	Scow	New Westminster, B.C.....1911	84.0	28.1	7.0	139	139	J. McL. Macmillan, Vancouver, B.C.
141450	K. 50.....	"	"	".....1919	87.9	33.7	8.9	227	227	S. S. McKeen, Vancouver, B.C.
141410	Marjorie Hennigar.....	Lunenburg, N.S.	Schr.	Chester Basin, N.S.....1919	116.1	27.0	10.6	161	108	C. H. Ritcey, Riverport, N.S.
141411	Mary H. Hirtle.....	"	"	Lunenburg, N.S.....1919	124.2	26.8	10.6	169	111	J. Hirtle, M.O., Lunenburg, N.S.
141227	Nettie C.....	Weymouth, N.S.	"	Saulnierville, N.S.....1919	150.0	33.3	13.1	495	449	Acadia Shipping Co., Meteghan River, N.S.
138438	Peaceland.....	Annapolis Royal, N.S.	"	Annapolis Royal, N.S.....1919	114.0	30.0	10.6	287	262	Annapolis Shipping Co., Annapolis Royal, N.S.
141230	Rose Anne	Weymouth, N.S.	"	Belliveau's Cove, N.S.....1919	130.5	30.8	10.5	311	282	B. Belliveau, Belliveau's Cove, N.S.
141517	Seaman, A. O.....	Parrsboro, N.S.	"	Cape d'Or, N.S.....1919	152.0	34.5	12.7	470	435	S. M. Field, Cape d'Or, N.S.
141516	Whiteson.....	"	Bkn	Alma, N.B.....1919	175.0	37.6	18.1	812	762	C. T. White & Son, Sussex, N.B.