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Another factor of importance in controlling the distribution of *Teredo* is salinity. There appears to be general agreement among shipping men and others familiar with the work of *Teredo* that any considerable amount of fresh water is fatal to it. On this point, Mr. H. E. Miller states that "where the flow of fresh water is sufficient to have any effect on salinity there is an entire absence of *Teredo*."<sup>1</sup>

The speedy destruction of *T. navalis* already alluded to which results when it is brought into St. John's harbour on ships is doubtless due to its inability to withstand brackish water. While this factor would explain its absence from certain bays and estuaries of the Bay of Fundy, neither salinity nor temperature will afford a satisfactory explanation of the general scarcity or absence of *Teredo* in these waters. If temperature alone were sufficient to bar *Teredo* from the Bay of Fundy it is difficult to understand how *Illyanassa obsoleta*, one of its congeners in the Acadian colony of the gulf of St. Lawrence should be able to make its way into the shallow bays on the east side of the Bay of Fundy, where I have found it at most points where I have dredged. This species on the opposite side of the Bay of Fundy is rare or absent.<sup>2</sup> One of the peculiarities of *T. navalis* is its aversion to water containing sediments or other impurities in suspension. Various writers have noted this aversion. The waters of the Bay of Fundy are unique in their extreme turbidity: no other waters on the American coast approach them in this respect. This is due to the very high tides, and the correspondingly swift currents in the estuaries which keep the waters near the coast everywhere turbid with sediment. In the Bay of Fundy there is a tidal range of 40 to 60 feet. In Northumberland Strait where *Teredo* is abundant the tidal range is in the neighbourhood of 10 or 12 feet. The turbidity of the Bay of Fundy waters, particularly in the upper and narrower portion of the Bay, exceeds that of Northumberland strait in somewhat the same proportion as its tides exceed those of the strait. The high turbidity of the estuarine waters of the Bay of Fundy is believed to be chiefly responsible for the general absence or scarcity of *Teredo*. Barrows<sup>3</sup> has pointed out that a definite correlation exists between the rock boring habit and a location on the open coast. The need of protection from the waves at and near the tide line on open coasts doubtless developed rock boring as a protective measure. This normal open-coast environment which involved exposure to the surf included the normal salinity of the open sea and comparative freedom from silt. The heavily silt laden waters of the upper part of the Bay of Fundy afford the very antithesis of the open coast environment which is normal to rock boring molluscs and in this fact is to be found the explanation of the absence or scarcity of *T. navalis* as well as the rock borers *Zirfaea crispata* and *Petricola pholadiformis* in the Bay of Fundy.

## ASSOCIATED SPECIES.

A small crustacean, *Limnoria lignorum*, is associated with *Teredo* in some parts of its range whose wood-destroying habits are similar to those of *Teredo*. These two species which are similar only in habits, differ sufficiently in their preference for certain environmental factors to lead them to reach their maximum numbers and development along different parts of the coast line. Their zones of habitat, however, overlap according to Murphy. This author states regarding the areas occupied by these two species that "wooden wharves or bridges along the Bay of Fundy and from there along the Atlantic coast as far as Whitehaven suffer from the *Limnoria*, while the location of the *Teredo* is farther east and north." . . . "There is no neutral ground between them. Their domains overlap for a few miles, each of the little borers becoming less abundant as we advance farther into the territory of the other."<sup>4</sup>

<sup>1</sup> Letter to the writer.

<sup>2</sup> Huntsman, Dr. A. G. Letter to the writer, February 5, 1917.

<sup>3</sup> Barrows, A. L. The Geologic Significance of Fossil Rock-Boring Animals, Bull. Geol. Soc. Amer., Vol. 1917.

<sup>4</sup> Proc. and Trans. N.S. Inst. Sci. Vol. 8, 1895, p. 218.