

SESSIONAL PAPER No. 38a

piles had been creosoted (ten pounds to the square foot) before they were driven in, but not to much purpose."¹

The palmento of the southern states and some of the Australian woods are said to be immune from the attacks of *Teredo*. The papers by Putnam² and Cunningham³ contain much information on the habits of *Teredo*.

An Icelandic naturalist⁴ has made some interesting observations and experiments on the habits and biological characteristics of *Teredo norvegica*, the species found on the southern and western coasts of Iceland. Mr. Frits Johansen has kindly furnished the following translation and summary of these from the Danish: "The propagating (spawning) season continues through the whole summer (April-August). No larvae are found in the mantle-cavity or in the sea; but numerous very small ones (burrows 1mm. long 0.5mm. wide) are found in driftwood from Faxebugt (W. coast) at the end of July.

"The growing period is mostly limited to two years as shown by experiment: I kept some pieces of wood with *Teredo* taken from the false keel of a fishing boat and kept it in a shaded cool place; the animals remained alive ten days; but inside of two weeks all were dead. Kept in a temperature of 6° C. for two days they all froze stiff, but were alive when thawed out again. In fresh water they only lived two to three hours; three hours in half sea and half fresh water or in putrid sea water.

"It is mostly only on two places that ships are attacked; at the waterline and in the false keel (or if this is missing the lower part of the keel itself). That this keel part is attacked is because it is buried in the sand, when the ship is beached, and thus gets no paint or tar. The "waterline" part of the ship gets easily its protection of paint or tar scraped off when loading, anchoring, etc. Plank edges are first and most attacked.

"The *Teredo* avoids leaving the wood in which it bores. Hence from the false keel only a few had penetrated to the true keel, and the burrows avoided the outer surface of the false keel. Where two parts of the false keel joined, the burrows never went through the contact but stopped short of a couple of inches. But how does the *Teredo* know when to stop burrowing? Maybe by sound-sense? In piers at Reykjavik, where *Limnoria lignorum* Ratk. burrows together with *Teredo*, one frequently sees that *Limnoria* eats away the woodparts surrounding the *Teredo* burrows and the calcareous lining of the *Teredo* burrows are exposed. *Teredo* therefore protects itself by thickening its calcareous lining 3 to 4 times the usual thickness by internal secretions.

"Boats on the water at the south and southwest coast are attacked by it.

"In later years it has been very numerous and destructive in sea-going ships belonging to the southwest coast; in many cases *Teredo* has been imported with ships bought in England, but some ships built in Iceland or lumber put into ships in Iceland have been attacked. Ships belonging to the north and northwest coasts (beached during the winter) seem to be free of *Teredo*. Maybe the many English ships bought and the unusually mild winter, and the fact that the ships are on the sea all winter are the causes of its frequency at the southwest coast for the last five or six years.

"The largest *Teredo* I have seen measured 27.5 cm. (to the base of the siphons) siphons ca. 2.5 cm.; average size of *Teredo* 16-18 cm., built in 1892."

¹ *Ibid.*, p. 135.

² Putnam, J. W.—The Preservation of Timber. Scientific American Supplement, Vol. X, No. 236, July 10, 1880, 3762-3763.

³ Cunningham, J. T.—*Teredo*. Encyclopaedia Britannica, 9th Ed., Vol. XXIII, 1888, pp. 184-186.

⁴ Saamundson, B. Zoolog. Meddel. fra Island (Zool. Notes from Iceland, p. 43, pp. 51-52); Videnskab. Meddel. fra Naturhist. Foren. Kbh. for Aared 1893 (Scientific papers from the History Society in Copenhagen for year 1903).