

136. *Salpa Caboti* Desor.
U. S. F. C.—Vineyard Sd., Mass., surface.

BRACHIOPODA.

137. *Terebratulina septentrionalis* Gr.
U. S. F. C.—Casco Bay, Maine.

- 137a. *Terebratulina septentrionalis* Gr.
U. S. F. C.—Eastport, Maine, 1 to 60 fath.

POLYZOA or BRYOZOA.

138. *Crisia eburnea* Lamouroux.
U. S. F. C.—Gloucester Harbor, Mass.

139. *Tubulipora serpens* Flem.
U. S. F. C.—Vineyard Sound, Mass.

140. *Tubulipora Atlantica* Smitt.
U. S. F. C.—Bay of Fundy.

141. *Alcyonidium ramosum* Verrill.
U. S. F. C.—New Haven, Conn.

142. *Flustrella hispida* Gray.
U. S. F. C.—Gloucester, Mass., shore.

143. *Gemellaria loricata* Busk.
U. S. F. C.—Casco Bay, Maine.

- 143a. *Gemellaria loricata* Busk.
U. S. F. C.—Off Cape Cod, 20 to 40 fath.,
1879.

144. *Cellularia ternata* Johnst. (var.)
U. S. F. C.—Gulf of Maine, 10 to 45 fath.

145. *Caberea Ellisii* Smitt.
U. S. F. C.—Bay of Fundy, 1 to 20 fath.

146. *Bugula Murrayana* Busk.
U. S. F. C.—Nantucket Shoals, 8 to 12 fath.

147. *Bugula turrita* Verrill.
U. S. F. C.—Vineyard Sd. and off Nantucket Island.

148. *Mucronella nitida* Verrill. Dry.
U. S. F. C.—Vineyard Sd., Mass.

149. *Membranipora pilosa* Farre.
U. S. F. C.—Gloucester, Mass.

- 149a. *Membranipora pilosa* Farre.
U. S. F. C.—Gloucester, Mass., on algæ.

150. *Escharina Isabelliana* D'Orb. Dry.
U. S. F. C.—Vineyard Sound, Mass.

151. *Hippothoa hyalina* Smitt. Dry.
U. S. F. C.—Vineyard Sd., Mass.

152. *Lepralia Americana* Verrill. Dry.
U. S. F. C.—Gloucester, Mass., shore.

PORIFERA (SPONGES).

153. *Microciona prolifera* Verrill. Dry.
U. S. F. C.—Vineyard Sd. and Long I. Sd.

154. *Chalina oculata* Bowerb. Dry.
U. S. F. C.—Vineyard Sd., Mass.

- 154a. *Chalina oculata* Bowerb. Dry.
U. S. F. C.—Casco Bay, Maine.

155. *Suberites compacta* Verrill. Dry.
U. S. F. C.—Off Nantucket, Mass.

156. *Suberites compacta* Verrill.
U. S. F. C.—Off Nantucket I., Mass.

- 156a. *Suberites compacta* Verrill.
U. S. F. C.—Cape Cod Bay, 15 fath.

- 156aa. *Suberites compacta* Verrill. Dry.
U. S. F. C.—Cape Cod Bay, 15 fath.

157. *Cliona sulphurea* Verrill. Dry.
U. S. F. C.—Vineyard Sd., Mass.

158. *Tethya gravata* Hyatt.
U. S. F. C.—Buzzard's Bay, Mass.

159. *Tethya gravata* Hyatt. Dry.
U. S. F. C.—Buzzard's Bay, Mass.

160. *Raphiodesma lingua* Bow. Dry.
U. S. F. C.—Bay of Fundy, 10 to 60 fath.

OCURRENCE OF CHELURA TEREBRANS, A CRUSTACEAN DESTRUCTIVE TO THE TIMBER OF SUBMARINE STRUCTURES, ON THE COAST OF THE UNITED STATES.

By SIDNEY I. SMITH.

Upon the coast of Europe an Amphipod belonging to the genus *Chelura* has long been known, associated with the Isopod *Limnoria lignorum*, or "gribble" of English writers, in destroying the timber of all kinds of submarine structures. But, upon the coast of the United States, the *Chelura* has apparently escaped detection until very recently, and I

am not aware of any published notice of its occurrence, although *Limnoria* has been known for many years, and its ravages have often attracted attention. I have repeatedly made careful search for *Chelura* at many different points upon our eastern coast from New Jersey to Nova Scotia, and have examined many pieces of *Teredo*- and *Limnoria*-bored timber from other parts of the coast, but, until 1875, I was not able to discover an individual of the genus. In the summer of that year, while connected with the party of the United States Fish Commission at Woods Holl, Massachusetts, two small specimens of *Chelura* were discovered, associated with *Limnoria*, in a bit of wood scraped from one of the piles of the government wharf. A careful search was made upon the piles of several wharves in the neighborhood and among the government store of spar buoys, but no more specimens could be discovered, although *Limnoria* was found in abundance.

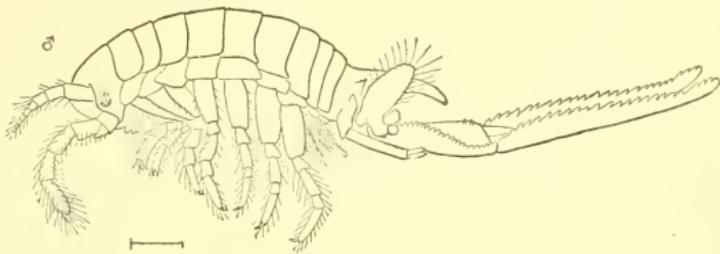


Figure 1.—*Chelura terebrans*; male; lateral view, enlarged about twelve diameters.

Without European specimens for comparison, these two individuals were scarcely sufficient to establish the identity of our species with the common species of Europe; and I delayed calling attention to the subject until more material should be discovered. No other specimens came to hand until August of the present year, when Professor Verrill discovered the species in abundance in old submerged piles at Provincetown, Massachusetts. The specimens found by Professor Verrill were all in wood submerged from 8 to 12 feet below the surface at low water, and were associated with *Limnoria lignorum* and *Teredo navalis*. The *Limnoria* occurred only sparingly, however, in this case, though it was found, by Mr. Sanderson Smith, in great abundance, with *Teredo navalis*, but without *Chelura*, in water-logged wood dredged the past summer in Cape Cod Bay in $7\frac{1}{2}$ fathoms. The specimens obtained by Professor Verrill exhibit all the variations due to age and sex, and show plainly that our species is identical with the European *Chelura terebrans*.

The species was first brought to notice by Philippi, who discovered it at Trieste, in company with *Teredo navalis*, in planks just taken from the sea, and who described and figured

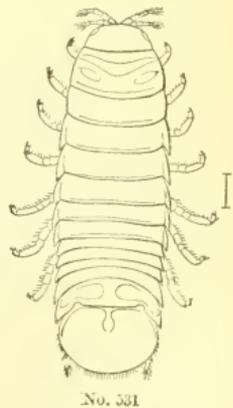


Figure 2.—*Limnoria lignorum*; dorsal view, enlarged ten diameters.

it in 1839. It was more fully described and figured by Allman, in 1847, from specimens found in the piles of the jetty in the harbor of Kingstown, near Dublin, Ireland. It has since been noticed at various points on the coast of Europe from Southern Norway to the Adriatic, and attention has often been called to its ravages.

There is apparently but one species of the genus known. The *C. pontica*, described by Czerniavski, in 1868, judging from the figures and the Latin part of the description, is not distinct. The figure which he gives of one of the abdominal swimming legs (pleopods) shows only one multi-articulate ramus, which is an evident inaccuracy in the drawing, and some other slight differences shown in the figures are apparently due to a similar cause. It is perhaps well to mention, in connection with this reference to Czerniavski's paper, a very remarkable paper published the same year by Eugene Hesse, in which this well-known European species is redescribed and extensively figured, from specimens taken on the coast of France, as a new species of *Limnoria*! The genus *Chelura* unquestionably belongs to the Amphipoda, and has been placed in that order and near *Corophium* by all carcinologists who have written upon the subject. It has, in fact, no structural features which ally it to the Isopoda, as distinguished from the Amphipoda, and it has no external resemblance to *Limnoria*, with which it need not be confounded by the most superficial observer.

The *Chelura* is readily distinguished from all the known genera of crustaceans by the structure of the three pairs of caudal stylets (uropods). The first (antepenultimate) pair of these appendages are slender and tipped with two small and nearly equal rami; the second have the dorsal edge of the basal portion expanded into a thin, broad, oval plate projecting beyond the two small rami which are attached in an emargination of the lower margin; the last pair have very stout but short bases, to each of which is articulated a single very long and strong ramus, which, in fully grown males, is nearly as long as the body of the animal, but much shorter in females and young. The length of fully grown male, from the front of the head to the ultimate pair of caudal stylets, is about a quarter of an inch (6^{mm}); that of the female somewhat less.

According to notes, made upon the specimens taken at Wood's Holl in 1875, the color of *Chelura* is very different from that of *Limnoria*, being semitranslucent, thickly spotted and mottled above with pink, somewhat as in *Unciola irrorata*, but wanting the opaque white of that species.

The following synonymy gives the bibliographical history of the species:

***Chelura terebrans* Philippi.**

Chelura terebrans Philippi, Archiv für Naturgeschichte, v, 1839, p. 120, pl. 7, fig. 5; Annals Nat. Hist., iv, p. 94, pl. 3, fig. 5, 1839.—Allman, Annals and Magazine Nat. Hist., xix, p. 361, pls. 13, 14, 1847 (see further under *C. destructor*).—White, Catalogue British Crust., p. 56, 1850; Popular History British Crust., p. 202, pl. 11, fig. 2, 1857.—Gosse, Marine Zoology, i, p.

Chelura terebrans—(Continued.)

138, fig. 250, 1855.—Bate, Report British Assoc. Adv. Sci., 1855, p. 59, pl. 13, fig. 3 (antenna), pl. 17, fig. 10 (integument), 1856; Annals and Magazine Nat. Hist., II, xix, p. 150 (1857); Catalogue Amphip. Crust. British Museum, p. 285, pl. 48, fig. 1, 1862.—Bate and Westwood, British sessile-eyed Crust., i, p. 503 (woodcut), 1863.—Heller, Beiträge zur näheren Kenntniss der Amphipoden des Adriatischen Meeres (Denkschriften Math.-Naturwissensch. Classe Kaiserliche Akad. Wissenschaften, Wien, xxvi), pp. 52, 61, 1866.—Boeck, Crust. Amphipoda borealia et arctica (Christiania Videnskab.-Selskabs Forhandling for 1870), p. 173 (253), 1870; Skandinaviske og Arktiske Amphipoder, p. 647, 1876.—Metzger, Jahresbericht der Comm. zur wissensch. Untersuchung der deutschen Meere für 1872-1873, Nordsee, p. 278, 1875.

Nemertes nesoides Leach, White, List Crust. British Museum, p. 90, 1847 (teste White, Catalogue British Crust., p. 56, 1850).

Chelura destructor Allman, loc. cit., p. 362, 1847 [provisionally proposed in case the Irish specimens prove distinct from Philippi's species].

Limnoria xylophaga Hesse, Annales des Sci. nat., Zoologie, V, x, p. 101, pl. 9, 1868.

Chelura pontica Czerniavski, Materialia ad zoographiam Ponticam comparatam, p. 95, pl. 7, figs. 1-18, 1868.

NEW HAVEN, October 16, 1879.

DESCRIPTION OF NEW SPECIES OF NORTH AMERICAN FISHES.

By **DAVID S. JORDAN.**

1. **BOLEOSOMA VEXILLARE**, sp. nov.

Allied to *Boleosoma effulgens*. Body rather short and stout; caudal peduncle not contracted; head moderate, the muzzle somewhat decurved; eye moderate; gill membranes scarcely connected; cheeks and breast naked; opercles scaly; a naked strip in front of the dorsal fin; opercular spine moderately developed; *second dorsal very short and high*, higher than long; pectorals and ventrals not reaching to anal.

Coloration olivaceous, the sides with traces of vertical bars, probably greenish in life; male with the first dorsal, ventral, and anal black; second dorsal and caudal strongly barred with black and white in fine pattern; head black; female not seen, but probably without black. Lateral line complete. Scales very large, 4-35-6.

Head 4 in length to base of caudal; depth $4\frac{2}{3}$.

Fin rays. Dorsal VIII-10; A. I., 7.

Length of type $2\frac{1}{2}$ inches.

This species differs from its relatives in the larger scales and the much shorter and higher second dorsal. (D. IX-13 in *B. effulgens*.)

The type was taken in the Rappahannock River at Warrenton, Va., by a correspondent of "Forest and Stream," and forwarded to me for identification by the editor of that journal, Mr. Charles Hallock.