

ON THE IDENTITY OF *Euchalarodus putnami*, GILL, WITH
Pleuronectes glaber, (STORER) GILL, WITH NOTES ON THE
 HABITS OF THE SPECIES.

By TARLETON H. BEAN.

In October, 1864, Prof. Gill described a remarkable new genus of pleuronectoids under the name of *Euchalarodus*,* from specimens sent to him from Salem, Massachusetts, by Prof. F. W. Putnam, which has ever since been considered an anomaly among flat-fishes. *Euchalarodus Putnami* is little known except through the excellent description of its founder, the few specimens collected being shared by only two museums—that of the Peabody Academy, Salem, and the U. S. National Museum. In contrasting *Euchalarodus* with other American genera of Pleuronectinæ, Prof. Gill says:† “From the American genera *Pseudopleuronectes*, Blkr., *Liopsetta*,[‡] Gill, *Myzopsetta*, Gill, and *Limanda*, Gottsche, it is at least distinguished by its squamation, oculo-scapular ridge, nostrils, dentition and structure of the dorsal and anal fins. It is most nearly related to *Pleuronectes*,[§] with which it agrees in the free tongue, but the more perfect union and the triangular form of the wholly united lower pharyngeal bones, the want of an anal spine, and, above all, the movable teeth and scarcely perforate anterior nasal tubes will especially distinguish it, not only from that genus, but from any other known one. So anomalous indeed are the characters of dentition and nostrils, that only after I had felt each tooth could I be convinced that they were really normally movable, and that the condition was not the effect of disease, an idea which, improbable as it was, occurred to me. The remaining genera of the subfamily of Pleuronectinæ—*Platichthys*, Grd., *Parophrys*, Grd., *Lepidopsetta*, Gill, *Glyptocephalus*, Gottsche, *Microstomus*, Gottsche, *Pleuronichthys*, Grd., *Hypsopsetta*, Gill, *Heteroprosopon*, Blkr., and *Clidoderma*, Blkr.—are equally or still more distinct than those already mentioned.”

From the above and from an examination of the types it is evident that we should compare *Euchalarodus* with *Pleuronectes*. This I have done, employing for the purpose the types of the description of *Euchalarodus Putnami*, Gill, and specimens of *Pleuronectes glaber*, (Storer) Gill, and *Pleuronectes platessa*, Linn. My investigations force me to the conclusion that these are all members of one and the same genus, *Pleuronectes*, since they possess in common the characters of that genus as defined by Bleeker, as well as those by which *Euchalarodus* was differentiated from *Pleuronectes*. *Euchalarodus*, by the way, has an anal spine.

* Proc. Acad. Nat. Sci. Philad. 1864, pp. 221 and 222.

† Op. cit. p. 222.

[‡] The *Platessa glabra* of Storer, for the accommodation of which this genus was proposed, has since been referred to the genus *Pleuronectes* (Art.) Bleeker, by Prof. Gill.

[§] *Pleuronectes* (Art.) Bleeker, Verslagen en Mededeelingen der koninklijke Akademie van Wetenschappen, Deel xiii, Amsterdam, 1832, pp. 427, 428.

Take the most salient characters of the genus *Euchalarodus*—the movable teeth and scarcely perforate anterior nasal tubes—the same conditions may be observed in *Pleuronectes glaber* and *P. platessa*. *Euchalarodus Putnami*, in fact, is the male of *Pleuronectes glaber*, and differs from it only in having more of its scales ciliated. The young are like the adult male in this respect. Had all the examples of *Pleuronectes platessa* exhibited movable teeth, it would have led to the belief that *Euchalarodus* after all might be applied to the species of *Pleuronectes* with movable teeth, but one of them has the teeth firmly fixed, another has some in the upper jaw movable, and a third has all the teeth reclining and freely movable. The explanation of this condition is yet to be sought.

The materials used in this examination are as follows:

5358.	Types (2) of <i>Euchalarodus Putnami</i> .	Salem, Mass.	Putnam.	(Teeth of larger movable.)
20910.	<i>Pleuronectes glaber</i> , ♂.	Portland, Me.	Tarleton H. Bean.	(Teeth movable.)
20920.	" "	♂ and ♀.	Salem, Mass.	C. F. Putnam. (Teeth movable.)
20954.	" "	(7 young*).	Bucksport, Me.	C. G. Atkins. (Teeth fixed.)
14657.	" "	(half-grown).	Portland, Me.	Summer, 1872. (Teeth fixed.)
14659.	" "	" "	" "	" "
14662.	" "	" "	" "	" "
14666.	" "	" "	" "	" "
14667.	" "	" "	" "	" "
14669.	" "	" "	" "	" "
14673.	" "	" "	" "	" "
14677.	" "	" "	" "	" "
14678.	" "	" "	" "	" "
14379.	" "	" "	" "	" "
14381.	" "	" "	" "	" "
14682.	" "	" "	" "	" "
14683.	" "	" "	" "	" "
14684.	" "	" "	" "	" "
14685.	" "	" "	" "	" "
14658.	" "	(adult ♀).	" "	" "
14661.	" "	" "	" "	" "
14663.	" "	" "	" "	" "
14664.	" "	" "	" "	" "
14665.	" "	" "	" "	" "
14671.	" "	" "	" "	" "
14672.	" "	" "	" "	" "
14674.	" "	" "	" "	" "
20373.	" "	(1 ♂ and 2 ♀).	" "	Dec. 15, 1877. (Teeth movable.)
20954.	" "	(3 spent ♀).	Bucksport, Me.	Mar. 4, 1878. (Teeth transitional.)

It will be seen that the teeth of the adult male and female are freely movable only during the breeding season, and that those of the young are fixed.

10029.	<i>Pleuronectes platessa</i> .	Kiel.	Dr. Möbins.	(Teeth fixed.)
10061.	" "	Christiania,	Norway.	R. Collett. (Teeth movable.)
21175.	" "	France.	Mus. d'Hist. Nat. Paris.	(Some teeth of upper jaw movable.)

*The longest of these is 140^{mm} in length. All have rough scales.

As before remarked, *Euchalarodus Putnami* is not even specifically distinct from *Pleuronectes glaber*, a species well distinguished from *Pleuronectes platessa* by its more continuous and pronounced oculo-scapular ridge, its radial formula, and other characters. The synonymy of *Pleuronectes glaber* is as follows:

Pleuronectes glaber, (Storer) Gill.

Platessa glabra, STOREY, Proc. Bost. Soc. Nat. Hist. i, 1843, p. 130; Mem. Amer. Acad. viii, 393, pl. xxxi, fig. 1; Hist. Fishes Mass. 1837, p. 199, pl. xxxi, fig. 1.—PUTNAM, Bull. Essex Inst. vi, 1874, p. 12.

Liopsetta glabra, GILL, Proc. Acad. Nat. Sci. Phila. 1864, p. 217.

Pleuronectes glaber, GILL, in Rep. U. S. Com. Fish and Fisheries, 1873, p. 794.—GOODE & BEAN, Amer. Jour. Sci. and Arts, xiv, 1877, p. 476; xvii, Jan. 1879, p. 40.

Euchalarodus Putnami, GILL, Proc. Acad. Nat. Sci. Phila. 1864, pp. 216 and 221; in Rep. U. S. Com. Fish and Fisheries, 1873, p. 794.—PUTNAM, in Storer, Hist. Fish. Mass. 1837, p. 279.—GOODE & BEAN, Amer. Jour. Sci. and Arts, xiv, Dec. 1877.

The smooth plaice, *Pleuronectes glaber*, (Storer) Gill, was described by Storer from the coast of Massachusetts. Specimens from Salem Harbor, November 15, 1872, are in the Museum of Peabody Academy. The U. S. Fish Commission found it very abundant, during the summer of 1872, in Bluelight Cove, Casco Bay, Maine, and they seined the young at Salem in August, 1877. Mr. C. A. Putnam of Salem took specimens at Beverly Bridge in January, 1858,—the specimens which formed the types of *Euchalarodus Putnami*. I add the following from my notes:

December 15, 1877, ten specimens were found among the flat-fishes (*Pseudopleuronectes americanus*) in Washington Market, which had come from Portland, Me., by way of Fulton Market, New York. Nine of these were gravid females, and one was a male, which was smaller than the average of the females, and had rougher scales.

December 18, 1877, thirteen specimens were again taken from among the flat-fishes, nearly all of them from one stand. All were females, most of them gravid. The weight of the largest was 23 ounces avoirdupois; of its spawn, 7 ounces. The ovary of the blind side extended from the origin of the ventral to the end of anal ($7\frac{1}{4}$ inches). The ovary of the eyed side was $6\frac{2}{10}$ inches long. The eggs were one-thirtieth of an inch in diameter. The length of the fish was $13\frac{1}{2}$ inches. The smallest of the thirteen weighed $3\frac{3}{4}$ ounces, and contained eggs about as large as those of the preceding. There is considerable variation in the extent of the ventrals.

January 10, 1878, two fresh specimens were received through Mr. C. F. Putnam, from Salem, Mass., a male and a gravid female. The weight of the male is 5 ounces; of the female, 21. They are called "fool-fish" in Salem, because they will bite even at a rag. It is said that they appear about Christmas in numbers, and remain only a short time. They probably come into the harbor to spawn. There is no record of the oc-

currence of the species farther south than Salem, though from the external resemblance of the male and the young to *Pseudopleuronectes americanus*, it might easily be overlooked. "Christmas-fish" is another name for the smooth plaice at Salem.

U. S. NATIONAL MUSEUM, December 31, 1878.

THE IDENTITY OF RHINONEMUS CAUDACUTA (STORER) GILL WITH
GADUS CIMBRIUS, LINN.

By G. BROWN GOODE and TARLETON H. BEAN.

In 1848, Dr. David Humphreys Storer described a gadoid fish from Massachusetts Bay, to which he gave the name *Motella caudacuta*.* In 1863, a special genus, *Rhinonemus*,† was framed for it by Professor Gill, and the species has since been called *Rhinonemus caudacuta* (Storer) Gill. After a critical examination of European and American specimens, we are convinced that this species is separated by no valid characters from that described by Linnaeus under the name *Gadus cimbrius*.‡ A specimen of the latter in the National Museum from Christiania, Norway (No. 10058, R. Collett), agrees precisely with specimens of *R. caudacuta*, so-called, from Massachusetts Bay (collected in 1877 and 1878 by the U. S. Fish Commission), in proportions of body and fins, shape of head, numbers of fin-rays, and coloration. The radial formula is misstated by Storer, who gives it D. 53, A. 48, and this evidently misled Professor Gill, who noted that *Rhinonemus caudacuta* was "very closely related to the *Motella cimbria* of Europe," but who evidently had at the time of naming the genus never seen a specimen of the species from either side of the Atlantic. Storer's description of color, cited by Gill as separating his species from that of Linnaeus, applies very well to the latter: "the posterior margin of the second dorsal and anal fins, as well as the edge of the caudal fin of a dark slate color."

The radial formulæ of four specimens studied stand as follows:

10058	(Christiania).	D. 50.	A. 44.	P. 16.	V. 5.
21918	(Massachusetts Bay).	D. 49.	A. 43.	P. 16.	V. 5.
21919	(Massachusetts Bay).	D. 51.	A. 44.	P. 16.	V. 5.
21919 a	(Massachusetts Bay).	D. 52.	A. 45.	P. 16.	V. 5.

The genus *Motella* was not proposed in proper form until the publication of the second edition of Cuvier's Règne Animal in 1829, although in its French form—*Les Mustèles*—it was applied by Cuvier to the genus in 1817. The name of Risso, published in his "Europe Meridionale" in 1827, must therefore be used as Professor Gill has indicated.§

* Proc. Bost. Soc. Nat. Hist. iii, 1848, p. 5.

† Proc. Acad. Nat. Sci. Phila. 1863 (Sept.), p. 230.

‡ Systema Naturæ, ed. 12, 1766, p. 440.

§ L. c. p. 241.