

collection of the Philadelphia Acad. of Nat. Sciences; also, that the writer, who has collected many scores of specimens, has never found them associated with any other species of the genus.

JOHN FORD.

Philadelphia, Pa., Dec. 12th, 1889.

THE SHELL-BEARING MOLLUSCA OF RHODE ISLAND.

BY HORACE F. CARPENTER.

FAMILY UNIONIDÆ.

This family formerly called Naidæ, embraces those shells commonly called fresh-water clams or mussels. They are found in rivers and ponds all over the world, but they reach their greatest perfection in this country. Over twelve hundred species are known to science, named and properly classified, of which more than half inhabit the U. S. This family has been made the special study of the late Dr. Isaac Lea, of Philadelphia, who died at the advanced age of ninety-five years, on the eighth of Dec., 1886. He devoted fifty years of his life to the study of the Unionidæ and has described more new species than all other conchologists together. He has read before scientific and other societies one hundred and fifty-seven papers and has been honored by degrees and honorary membership of twenty-five of the most prominent universities and scientific associations of the world. His great work, "Observations on the genus *Unio*" consists of thirteen quarto volumes, illustrated by hundreds of beautiful plates.

The shells of this family are not in general very attractive on the outside, but the interior of the valves are always lined with a beautiful pearly substance called nacre, which in some specimens are pure white and in others salmon, rose-red, blue, green, purple, etc. The sexes in this family are distinct, which is an exception to the rule in a large majority of the species of Mollusca, where the sexes are united in each individual. The shells exhibit but little variation in form except the usual one, that the females are more ventricose and broader behind than the males.

The animals of this family are all capable of producing pearls, some of which are of great beauty and value. In one instance sixteen pearls were obtained from a single specimen. One of the

objects of Cæsar's expedition to Great Britain from the fresh-water clams of that country. Scotland in the river Tay, were continued a century and many large and beautiful pearls were found in the river Tyronne, in Ireland.

One of the finest of the English pearls is the crown. Old and deformed specimens are pearls, and they consist of a nucleus of such a grain of sand, covered by substance secreted by the mantle of the animal. The shell with its species, and is of the same shade as the interior of the valves.

In China the natives make little flat pieces of shell which they insert between the shell and the mantle, and by prying open the valves of these clams with these pieces of shell of these foreign substances irritates the mantle and a deposit layer after layer of nacre upon the interior of the shells are opened and the images removed.

This family is divided into six genera, the most common in U. S.: they are called *Unio*, *Margaritana*

Genus *Unio*, Retzius.

Shell equivalve, multiform; hinge with a simple or divided tooth in each valve, and a single tooth.

There are about one thousand species of which about one hundred of which are American and one hundred inhabit the Ohio river and its tributaries. There are about a hundred found in New England and but three in the West.

187.—*Unio complanatus*, Solander.

Syns.:

- Mya complanata*, Soland. and Dillw.
- Unio purpurens*, Say, Desh. Barnes.
- Unio purpuraceus*, Lam.
- Unio violaceus*, Spengl.
- Unio fluviatiles*, Green.
- Unio (Naiia) complanatus*, Perkins.

Shell elongated-oval; beaks at the anterior end; surface coarsely wrinkled by the

objects of Cæsar's expedition to Great Britain was to obtain pearls from the fresh-water clams of that country. The pearl fisheries of Scotland in the river Tay, were continued until the end of the last century and many large and beautiful pearls were found in the river Tyronne, in Ireland.

One of the finest of the English pearls is now in Queen Victoria's crown. Old and deformed specimens are the most liable to contain pearls, and they consist of a nucleus of some foreign substance such as a grain of sand, covered by successive layers of nacre secreted by the mantle of the animal. The color of the pearls varies with its species, and is of the same shade as the nacre which lines the interior of the valves.

In China the natives make little flat lead casts of their idols; these they insert between the shell and the mantle of the animal, by prying open the valves of these clams with a wedge; the presence of these foreign substances irritates the animal and causes it to deposit layer after layer of nacre upon them. After a time the shells are opened and the images removed and worn as charms.

This family is divided into six genera, three of which inhabit the U. S.: they are called *Unio*, *Margaritana* and *Anodonta*.

Genus *Unio*, Retzius, 1788.

Shell equivalve, multiform; hinge with a short, irregular, striated, simple or divided tooth in each valve, and an elongated, marginal tooth.

There are about one thousand species of this genus, nearly eight hundred of which are American and one hundred and fifty or more inhabit the Ohio river and its tributaries; only five of these are found in New England and but three inhabit R. I.

187.—*Unio complanatus*, Solander.

Syns.:

*Mya complanata*, Soland. and Dillw.

*Unio purpurens*, Say, Desh. Barnes.

*Unio purpuraceus*, Lam.

*Unio violaceus*, Spengl.

*Unio fluviatiles*, Green.

*Unio (Naia) complanatus*, Perkins.

Shell elongated-oval; beaks at the anterior fourth, almost always eroded; surface coarsely wrinkled by the lines of growth, and

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JOHN FORD.

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of Mollusca, where the sexes  
shells exhibit but little varia-  
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gle specimen. One of the

covered with a thick tar-colored or very dark green epidermis; interior lined with a dark peach blossom nacre, sometimes salmon colored. There is a single, erect, pyramidal, coarsely striated cardinal tooth in the right valve, and two triangular, pyramidal teeth in the left valve; lateral teeth long, compressed and slightly curved. Length,  $3\frac{1}{2}$  inches; height, 2 inches; breadth, 1 inch.

This is our most common fresh-water clam. It is found in all the rivers in the U. S. which empty into the Atlantic Ocean, but is not found west of the Atlantic slope. It is also abundant in almost all the ponds east of the Allegheny mountains. It might be collected by bushels in the Blackstone River, Cunliff's Pond, Old Warwick Pond and many others. It is a favorite article of food for the muskrat, which devours them in great numbers, leaving piles of empty shells on the edges of the streams and ponds. It is a very curious thing how the muskrat can open the shell and devour the animal without leaving a mark of teeth or claw upon the shell. Specimens freshly cleaned of their contents are in as fine condition for the cabinet as those obtained alive and prepared on purpose, the two valves held together perfectly by the ligaments, and the edges or margins of the shell unbroken.

188.—*Unio nasutus*, Say.

Syns.:

*Mya nasuta*, Wood.

*Eurynca nasuta*, Stimp, Perkins, Morse, etc.

*Unio rostratus*, Valenc.

*Unio nasutus*, Say, Con. Lea, Gld. Dall, etc.

Shell slender, very inequilateral; beaks small, pointed and slightly elevated, posterior produced so as to form a snout, from which peculiarity its specific name. There are usually two or three radiating lines running from the beaks to the end of the snout. Surface smooth; epidermis glossy, of a dark olive-green color, becoming dusky in old specimens. Nacre silvery white, iridescent, sometimes with shades of bluish or salmon; cardinal teeth delicate, compressed and directed obliquely forwards; cavity of the beaks small. Length, 3 inches; height,  $1\frac{1}{2}$  inches; breadth,  $\frac{1}{2}$  inch.

Described by Thos. Say in Nich. Ency. 1816. It is quite a common shell in the Middle and some of the Western States, but is very rare in New Eng. It has been found in only four localities in Mass.

and in one in Conn., and after searching and having given up all hopes of finding discovered a locality in the summer of 18 species of shells in Cunliff's Pond at El a few single valves of this species lying that if dead shells were on the bank, live I went in, and succeeded in finding seven this rare and unique species.

#### GENERAL NOTES.

NEW AMERICAN SHELLS. The following in a paper read before the Philadelphia Academy, cylindrical species, the shape of *P. musc* as *armifera*, the mouth without teeth, similar from Lower California. *Zonites selenitoide* little larger than *Z. minusculus*, ribbed like *Streatori*, from Cayman Id., south of Cuba Tryon, but more depressed, banded with a more conical spire.—*Pilsbry*.

PÆCILIZONITES CIRCUMFIRMATUS var. CO from the typical form in lacking color-mark horn-colored. The specimens were given me by Mr. H. A. Pilsbry, who collected them in Bermuda.—*Pilsbry*.

PUPA WANTED. The editor wishes to see a specimen of *decora* Gld. for comparison with Western shells.—*Pilsbry*.

LIMAX AGRESTIS IN PHILADELPHIA. A series of 21 examples of this species collected and kindly sent to me by Mr. H. A. Pilsbry and judge from alcoholic specimens, five color-varieties. Two specimens appear white, and may be *typicus* Less. and Poll., but approach *rufescens* Picard. Six are pale ochery, and spotted with brownish marbling or mottled, and have very indistinct brownish marbling or mottled, and are to be regarded as *obscurus*. Five (now Drap.), and two are to be regarded as differing slightly from the description of that

and in one in Conn., and after searching in vain for several years and having given up all hopes of finding it in R. I., I unexpectedly discovered a locality in the summer of 1871. In hunting for other species of shells in Cunliff's Pond at Elmville, in Cranston, I saw a few single valves of this species lying near the shore; knowing that if dead shells were on the bank, live ones must be in the pond, I went in, and succeeded in finding several splendid specimens of this rare and unique species.

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 GENERAL NOTES.
 

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NEW AMERICAN SHELLS. The following species are described in a paper read before the Philadelphia Academy. *Pupa Sterkiana*, a cylindrical species, the shape of *P. muscorum*, but nearly as large as *armifera*, the mouth without teeth, surface strongly rib-striate, from Lower California. *Zonites selenitoides*, a Californian species, a little larger than *Z. minusculus*, ribbed like *Selenites duranti*. *Helix Streatorii*, from Caymon Id., south of Cuba, allied to *H. gaussoini* Tryon, but more depressed, banded with chestnut color, and with more conical spire.—*Pilsbry*.

PECCILOZONITES CIRCUMFIRMATUS VAR. CORNEUS. This is different from the typical form in lacking color-markings. Shell thin, fragile, horn-colored. The specimens were given me by the ABBE VATHÉLET, who collected them in Bermuda.—*Pilsbry*.

PUPA WANTED. The editor wishes to obtain specimens of *Pupa decora* Gld. for comparison with Western shells. A liberal exchange will be given.—*Pilsbry*.

LIMAX AGRESTIS IN PHILADELPHIA. I have just examined a series of 21 examples of this species collected in Philadelphia, Pa., and kindly sent to me by Mr. H. A. Pilsbry. So far as one can judge from alcoholic specimens, five color-varieties are represented. Two specimens appear white, and may be referred to var. *albidus*, Picard. Six are pale ochery, and spotless, and are referable to *typicus* Less. and Poll., but approach *rufescens* in their color. Six have very indistinct brownish marbling or reticulation, and may be classed under Moquin's var. *obscurus*. Five are var. *sylvaticus* Moq. (now Drap.), and two are to be regarded as *V. reticulatus*, although differing slightly from the description of that variety. One specimen

ILUS.

very dark green epidermis; smooth nacre, sometimes salmon-colored, coarsely striated carapace, triangular, pyramidal teeth impressed and slightly curved. Breadth, 1 inch.

clam. It is found in all the Atlantic Ocean, but is not also abundant in almost all seas. It might be collected in Cunliff's Pond, Old Warwick. It is an article of food for the muskrats, leaving piles of empty shells. It is a very curious habit to devour the animal upon the shell. Specimens in fine condition for the cabinet. For the purpose, the two valves are separated, and the edges or margins

, etc.

, etc.

beaks small, pointed and used to form a snout, from which are usually two or three tentacles to the end of the snout. Color, dark olive-green above, silvery white, iridescent below; cardinal teeth delicate; cavity of the beaks smooth; breadth,  $\frac{1}{4}$  inch.

.816. It is quite a common species in the eastern States, but is very common in four localities in Mass.