ON THE DIVISION OF THE SPHAERIIDAE INTO TWO SUBFAMILIES: AND THE DESCRIPTION OF A NEW GENUS OF UNIONIDAE, WITH DESCRIPTIONS OF NEW VARIETIES.*

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In 1895, Dall called attention to the difference in siphonal arrangement between Sphaerium and Pisidium, and said "If this is found by more extensive observation to be constant within the genera the family might be divided into two subfamilies (Wagner Free Inst. Sci., III, p. 540). The examination of upward of a hundred species of these two genera, together with many species of Musculium, seem to attest the accuracy of Dall's suggestion and the propriety of separation into two groups or subfamilies. Hannibal (Proc. Mal. Soc. London, X, p. 133, 1912) has instituted a family Corneocycladidae for the small clams known as Pisidium, but the name will have to be ignored since no characteristics of importance are given in the diagnosis.

Subfamily SPHAERIINAE Nov.

A distinct anal and branchial siphon; anterior end shorter than posterior end.

This group will include the genera Sphaerium, Musculium, and Eupera.

Subfamily PISIDINAE Nov.

Anal siphon only developed, the branchial siphon being represented by the mantle cleft; anterior end longer than posterior end.

This group includes the genus Pisidium. The foot of Pisidium differs from that organ in the Sphaeriinae in being

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larger in proportion to the size of the animal, more tongue-shaped, and capable of great extension. It is used for burrowing in the sand or mud of the bottom or for crawling over vegetation or debris on the bottom. Pisidium has been collected from algae far above the bottom, associated with Amnicola and Gyraulus.

In 1916, Utterback (Naiades of Missouri, p. 104) included *Anodonta imbecillis* in the genus Lastena under the Rafinesquian name of *Lastena ohioensis*. Ortmann in 1919 (Mem. Carnegie Mus., VIII(p. 162) and Ortmann and Walker, in 1922 (Occ. Papers, Mus. Zool., Univ. Mich. p. 37), have shown that this name cannot be used for the species, and genus, the name Lastena having been correctly diagnosed and a type fixed by Simpson in 1900 (Proc. U. S. Nat. Mus., XXII, p. 654).

As indicated by Utterback, however, the species *Anodonta imbecillis* differs in several particulars from the other members of the genus Anodonta and it should be recognized as a distinct group of the Anodontinae. The shape of the umbones is quite different, no Anodonta having such flattened beaks. The animal is hermaphroditic and there is no parasitic stage in the development of the glochidium, the process taking place in the marsupium and the young mussel discharged when ready to begin independent life. These characters differentiate *imbecillis* from all other Anodonta at present known. I would, therefore, designate the group as Genus Utterbachia Nov., with *Anodonta imbecillis* as the type.

It is probable that when the various types of shell referred to this genus are critically examined from all parts of its range there will be found differences of specific or varietal importance. Its present known range is from southern Michigan and Wisconsin south to Mexico, east to western New York and west to Kansas and Oklohama. Typically, *imbecillis* is a river form being particularly abundant in small streams where there is a muddy bottom, where it is usually buried from sight.

Utterbackia imbecillis fusca Var. Nov.

Shell differing from typical *imbecillis* in being smaller, more cylindrical, shorter in relation to height, valve less swollen in the center of the disc, and color shades of brown with rarely yellowish rays on an olive background.

L. 48; H. 25; D. 14 mm. Holotype. Univ. Wis. Coll., 927a.

L. 43; H. 21; D. 11 mm. Paratype. Univ. Wis. Coll., 927b.

Type locality: Sturgeon Bay, Door Co., Wis. Types Univ. Wis., 927a-c.

This variety of *imbecillis* occurs on the open shore of Sturgeon Bay below the city. The bottom in this region is of sandy-clay, more or less marly, and with some Chara. It appears to be a dwarfed form of *imbecillis* produced, probably, by its habitat in a turbulent bay, certainly a markedly different environment from the quiet reaches of a small, mud-bottomed stream.

Anodonta henryana Lea, described from Matamoras and Tamaulipas, Mexico, is a member of the genus Utterbackia and probably a distinct species. It is in the Hinkley collection of the University from San Rafael, Texas. A form of *imbecillis* from Alabama may be a variety, but not enough material is at hand to determine this question.

Carunculina parva cahni Nov. Var.

Shell differing from typical *parva* in being larger, more inflated, with heavier hinge teeth. It is well rounded at both ends and there is not the distinct difference due to sex shown in *parva*. The beak sculpture is very heavy.

L. 45.5; H. 25.5; D. 25.0 mm. Type. (U. I. Z17341).

L. 41.0; H. 24.0; D. 22.0 Paratype. (U. I., Z17342).

Type locality: Neosha mill pond, Dodge Co., Wis. Types in Univ. Ill Mus. Nat. Hist., Z17341, Z17342. Also collected in Lake Koshkonong, Jefferson Co., Wis.

This form of *parva* is so distinct from the usual small, more or less compressed form of the species, as found in Wisconsin and Illinois, that it should be designated as a variety. Typical *parva* has a width index of 40-50% while *cahni* has an index of 50-55%. It appears to be a pond or lake form, typical *parva* being a river form, and the distinction may be

largely one of ecology. The specimens were collected by Dr. Alvin R. Cahn, of the Department of Zoology, University of Illinois, to whom the variety is dedicated.

Lampsilis siliquoidea pepinensis Var. Nov.

Shell differing from typical *siliquoidea* in being comparatively shorter and higher, of much greater diameter with a more marked posterior slope, a thicker, heavier shell and more massive pseudocardinal teeth. The surface is usually marked with bright green rays with marked intensity.

L. 94; H. 58; D. 39 mm. Male. Paratype.

L. 77; H. 52; D. 48 mm. Female. Holotype.

L. 87; H. 52; D. 38 mm. Male. Holotype.

Type locality: Lake Pepin, near Lake City, Minn. Collected by Mr. Geo. Wagner. Types in Univ. Wis., Coll., 354, 355, 361.

The *siliquoidea* from Lake Pepin are peculiar in having the valves of the shell very thick and heavy and in being greatly inflated, the female often being almost globular in extreme forms. This form has long been known among mussel fishermen as the "Lake Pepin mucket" and it seems quite appropriate that a scientific name should be given to so marked a variety. It, like many other of the naiades, is a response to lake conditions acting on a river species. The form appears to ascend the St. Croix River as far as Osceola above which the form appears to again resume the *siliquoidea* condition. The material examined, which has been quite ample, shows little variation from the form as indicated in the above diagnosis.