

TYPES OF NORTH AMERICAN UNIONIDAE IN THE
COLLECTION OF THE CARNEGIE MUSEUM

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The material here revised includes only the primary types: holotypes, syntypes, lectotypes, paratypes; occasionally an allotype, or, when a topotype specimen was revised by the author of the species, a metatype are included. The nomenclature and status of the species have been updated with additional notes and observations. One species from Guatemala and another from Nicaragua were added to complete the list of types of Unionidae in the collection.

Original materials described by Grier, Utterback, and Ortman as 'varieties,' 'races,' or 'forms' were synonymized under their actual species names in capitals, but listed by their first references. This criterion for dealing with variations is valid for almost all the trinomials used, or introduced by Ortman (1919 Monogr. Naiades of Pa., Mem. Carnegie Mus. 8). It is evident that these are not subspecies by standards of allopatry. Ortman was perfectly aware of such conditions on which he often remarked; for example, of *Anodonta grandis* he said, 'a number of [variations] them have received names [but] certainly are not subspecies in the strict taxonomic sense. I shall mention some of these forms with the express understanding that I regard them as individual variations.' Thus, Ortman used the trinomial as a convenient way to

refer to clinal, local, or individual variations, but without taxonomic standing because, as he repeatedly stated 'it is impossible to separate them except by drawing an artificial line.' Consequently, the taxonomic simplification used in this paper is not in conflict with Ortman's system by inobservance of it.

The species have been arranged into four subfamilies. The conventional division of the North American Naiades of the family Unionidae recognizes three subfamilies: Unioninae, Anodontinae, and Lampsilinae, and occasionally a tribe Alasmidontini. A recent classification by Morrison (Reports Amer. Malac. Union for 1955 and 1966), separates Unionidae (Unioninae, Anodontinae, and Alasmidontinae) from Amblemidae (Ambleminae and Lampsilinae) on some anatomical and embryological basis. Such a system is not a very radical departure from the conventional as it might appear. Comparing with Ortman's divisions (*op. cit.*, part 1: 335; 1911), we find in his first key (Unioninae), *Quadrula*, *Rotundaria*, *Pleurobema*, and *Elliptio*, which correspond to what Morrison places in Amblemidae; the second Ortman key (Anodontinae) is practically the same as in Morrison, except for *Alasmidonta*; and the third key (Lampsilinae) contains the same genera that Morrison places in the same subfamily but under Amblemidae.

In other confrontation, with Thiele's 'Handbuch' (1935), we find again that the first twelve American genera arranged within the Unioninae correspond to Morrison's Amblemidae(nae), the Lampsilinae are correlated, with the Anodontinae in between. In some more recently published papers, the same correlation exists; in Clench and Turner (Bull. Florida State Museum, 1956), the first six genera listed under Unionidae are Morrison's Amblemidae; and Clarke and Berg (Cornell Univ. Mem. 367, 1959), the first four species under Unioninae are the Ambleminae, and in succession come Alasmidontini and Anodontini and last the Lampsilinae.

Thus, the discrepancies among these systems are only a matter of names. What Morrison did was to rank Anodontinae, plus Alasmidontinae in the already known family Unionidae, and separating them from the Amblemidae which includes Lampsilinae. The basis for this - glochidia and gill structure - has a taxonomic value of the same degree Ortmann used in 1911 to separate Margaritidae from Unionidae. But, although the argument is theoretically acceptable, it creates a greater problem than the one it intended to solve; after we have most of the American genera assembled in the Amblemidae (Ambleminae) according to Morrison, a vacuum has been produced, because the Unioninae s. s. are left devoid of genera in America, unless what Morrison really meant was that this subfamily should be restricted to the Old World Unios. An alternative would be to use Ambleminae (or tribe Amblemini) for that group of genera with all the four gills serving as marsupium, which includes *Amblema*, *Fusconaiia*, and *Quadrula*, as a more primitive group, and to reserve Unioninae for those in which only the two outer gills serve as marsupium, with *Rotundaria*, *Pleurobema*, and *Elliptio*. This will correspond to the old 'Homogenae' and 'Tetragenae' of Simpson; but then, it breaks into two parts Morrison's concept of Amblemidae. The possibility of such arrangement exists (in fact it simply consists in giving names to the main divisions a^1 and a^2 which Ortmann recognized in his key for Unioninae (1919: 6, 7); but it is not truly workable until the system is fully analyzed, with a critical

study of all the genera involved to be certain of their relationships, and not in abstract form. Meanwhile, the current system of three subfamilies (four if Alasmidontinae is accepted as a transitional group with reduced hinges, between Unioninae and Anodontinae), will keep us away from confusion. The system then, for all the Naiades of the western hemisphere, is at present as follows:

SUPERFAMILY UNIONACEA

- Family Margaritinae Ortmann, 1911
- Family Unionidae Rafinesque, 1820
 - Subfamily Unioninae s. s.
 - Subfamily Anodontinae Rafinesque, 1820.
 - Subfamily Lampsilinae, Ihering, 1901
 - Subfamily (?) Alasmidontinae Rafinesque, 1820
- Family Hyriidae Swainson, 1840
 - Subfamily Hyriinae s.s. (restricted Parodiz & Bonetto 1963)
 - Tribe Prisodontini Modell 1942 (transfer. Par. & Bon. 1963)
 - Tribe Castalini Parodiz & Bonetto, 1963)
 - Tribe Diplodontini Parodiz & Bonetto, 1963)

SUPERFAMILY MUTELEACEA Parodiz & Bonetto, 1963

- Family Mycetopodidae -ray, 1840
 - Subfamily Monocondylaeinae Modell, 1942
 - Subfamily Anodontinae Modell, 1942
 - Subfamily Leilinae Morretes, 1949

U N I O N I N A E

- Fusconaiia selecta* Wheeler, 1914
 - = FUSCONAIA FLAVA Raf.
 - Nautilus 28: 75, pl. 5.
 - Type loc.: Cache River at Nemo, Craighead Co., Arkansas.
 - Type lot: One paratype, from Frierson, CM 61.7723. The type was in Wheeler's collection. Other paratypes in Alabama Museum, ANSP.
 - This form is the same as *Unio trigona* Lea = *flava*.

Fusconaia flava parvula Grier, 1913

= FUSCONAIA FLAVA Raf.

Nautilus 23: 11 (not figured). Ortmann 1919: 21, pl. 2, f. 2.

Type loc.: Big Bend, Presque Isle, Erie Co., Pennsylvania.

Type lot; Lectotype (male) here selected corresponding to the one figured by Ortmann and measurements given on page 22; one allotype female; collected Ortmann July 8-12, 1910. CM 61.4513, twelve paratypes including juveniles. There are two more lots bearing the indication "type lot" collected at different times; five paratypes (plus one sent to the Ohio State Museum) from type loc., coll. June 3, 1908, CM 61.4370, marked type but it does not correspond to the one described, measured and figured, and to it Ortmann put an early label as "*Quadrula rubiginosa*," and afterwards added "*undata parvula*." (it is doubtful that Grier had seen this specimen).

This is the ecological, lake form of *flava*, the surface with regular and well marked growth lines (by these markings the lectotype is about 10 years old, and older specimens (60 X 43 mm.) about 15 years old, showing also that the individuals become more elongate with age and darker. *F. flava parvula* forms a localized clinal transition between *flava flava* and *flava undata-trigona*, to the point that it is impossible to draw a dividing line, *flava* disappearing clinally into the others. This shows parallelism of station with the *Fusconaia subrotunda* group. Clarke and Berg (1959) synonymized correctly *undulata*, *rubiginosa*, *undata*, and *trigona* under *flava*. The lectotype was originally labelled by Ortmann "*Quadrula undata trigona*."

* *Fusconaia cor analoga* Ortmann, 1918

= FUSCONAIA EDGARIANA (Lea)

1920 *Fusconaia edgariana analoga*, Ortmann, Proc. Am. Phil. Soc., 59: 286.

Type loc.: Speers Ferry on the Clinch River, Scott Co., Virginia (six miles north of the Tennessee line).

Type lot; Eight syntypes, 4 males and 4 females, CM 61.6526, collected Ortmann, June 8, 1913.

Compared with the description and type (in MCZ) of *Unio cor* Conrad, the form ana-

loga is not related whatsoever with that species. Other lots of *analoga* collected and labelled by Ortmann, from Alabama, Tennessee, and southwest Virginia, do not offer substantial differences with *edgariana*; some specimens are flatter as indicated in the description, but accounts for populations which are very variable according to locations up or down streams. All the northern tributaries of the Tennessee River around the Tennessee-Virginia line (Powell, Clinch, Holston) are only ten to fifteen miles apart. Ortmann estimated that "specimens with diameter less than 50% of the length fall under this var." but then, in populations of any species variable as this, individuals above or below that 50% are to be expected.

A species closely related to *edgariana* is *cuneolus* Lea, offering the same station differences (*c. cuneolus* and *c. appressa*). Before describing *analoga* Ortmann wrote on the label "*F. edgariana appressa*," and the distribution of both is about the same; I think we are dealing here with a superspecies complex which deserves revision.

Fusconaia subrotunda leucogona Ortmann, 1913

= FUSCONAIA SUBROTUNDA (Lea)

Nautilus 27: 89 (not figured).

Type loc.: Elk River, Gassaway, Braxton Co., West Virginia.

Type lot; Twelve syntypes (one sent to Ohio State Museum) 7 males of all sizes, and 4 females, CM 61.5239 (not 5399 as indicated in description) collected by Ortmann, July 8, 1911.

The author stated that *leucogona* does not differ substantially from typical *subrotunda*, and the Elk River shells are but a local race. Some of the syntypes approach *subrotunda kirtlandiana* "to a degree" (Ortmann), but in general are *subrotunda* which has the tendency in headwaters of the Ohio to develop a flat form (*kirtlandiana*) but without distinct allopatry. The young of *leucogona* and *subrotunda* are identical in all stations, and adult females are equal to the females of *kirtlandiana* as figured in Ortmann's 1919 (pl. 1, f. 3) monograph. The individuals become more angulated posteriorly when

they grow older. The series *subrotunda-kirtlandiana-leucogona* are just clinal phases of one and the same species.

Quadrula lananensis Frierson 1901
= *FUSCONAIA LANANENSIS* (Fr.)

Nautilus 15: 75, pl. 4.

Fusconaia escambia Clench and Turner ?
1956: 152, pl. 7, figs. 3, 4.

* Type loc. Lanana Creek near Nacogdoches,
Nacogdoches Co., Texas.

Type lot: 2 paratypes from type local-
ity, CM 61.5006, coll. by H. G. Askew,
Strode, and Frierson, July 1901; from Fri-
erson coll.

Although the original lots from Lanana
and Bonita Spring contained, according to
Frierson, about 200 specimens, the species
seems to be uncommon because it has been
seldom mentioned. *Fusconaia escambia*
Clench and Turner is very similar in shape
and colors; probably it is the same thing
as *lananensis* or no more than an eastern
subspecies or race, relatively smaller, a
little more rounded and with scarcely
higher umbos. Between these two forms,
Unio askewi Marshall from Texas seems
to be intermediary.

Unio wardii Lea 1863

= *QUADRULA METANEVRA* (Raf.)

Observations 1863, 9: 87.

Quadrula metanevra wardii, Ortmann 1920:
291.

Type loc.: Walthonding River (a tributary
of the Tuscarawas in the Upper Ohio Val-
ley), Ohio.

Type lot: 3 specimens, CM 61.1063, from
Coal River, Logan Co., Virginia, from ex-
Hartmann coll. These specimens were seen
and compared by Lea and are considered
paratypes. Johnson (Bull. MCZ 115 (4):
142) indicates one paratype in MCZ from
Hartmann-Anthony coll., with accleration
on the label by Lea who recognized it as
one of the specimens he gave to Anthony
from Coal River (not Tennessee as marked
on the label).

Unio wardii was based on some varia-
tion in the development of the tuberculae,
a character which is not constant in all
individuals; it could not even be consid-
ered as a race, since all degrees of such

development are present in different po-
pulations from Pennsylvania; the trinomial
is superfluous.

Quadrula quadrula contraryensis Utterback
1916

= *QUADRULA QUADRULA* Raf.

Amer. Midl. Nat. 4 (Reprint): 56, pl.
18, f. 47 (no type selected).

Type loc.: Lake Contrary at St. Joseph,
Buchanan Co., Missouri

Type lot: 3 syntypes, Utterback coll.,
CM 61.6892. None of the specimens can be
identified with the one figured, but the
larger one has the same dimensions as the
second male mentioned by the author.

This form is the same thing as *Unio*
fragosus Conrad (Monogr. 1836: 12, pl. 6,
f. 2) from Scioto River, Ohio. Before -
or while - describing *contraryensis*, Ut-
terback sent the referred syntypes to Ort-
mann who labelled them, first as *lachry-*
mosa (= *fragosus*), and afterwards he added
Utterback's denomination but remarking
(1919: 42) that it is only a "local phase"
of *Q. quadrula* (*sensu lato*) which is wide-
ly distributed in the Mississippi and Low-
er Ohio drainages, with ample variability
among individuals of the same populations,
and clinal at different locations. It is
very difficult, almost impossible, to sepa-
rate the forms *contraryensis-fragosa*,
lachrymosa from *quadrula quadrula*.

Elliptio waltoni Wright 1888

= *ELLIPTIO PRODUCTUS* (Conrad)

Proc. A.N.S.P. 1888: 114, pl. 2, f. 3.
Simpson, *Proc. U.S.N.M.*, 15: 431, pl.
73, f. 7.

Elliptio cupreus Raf., Ortmann 1919:
110, pl. 8, f. 6.

Elliptio productus (Conrad), Ortmann,
1922, *Occ. Papers MZUM* 112: 30.

Type loc.: Lake Woodruff, Volusia Co.,
central E. Florida.

Type lot: One syntype (or paratype?) CM
61.11835 (from L. E. Daniels ex-Wright
coll.) The type in A.N.S.P. The specimen
at hand is identical in all its features
with *E. productus* identified by Ortmann
from Alexandria, Virginia; in the Carnegie
Museum collection, numerous lots from
Pennsylvania, Virginia, and Georgia show

a progressive clinal variation toward more lanceolate forms in southern localities. *E. productus* is becoming rather scarce in the south, and recent reports from extensive collecting in Georgia and Florida (Clench and Turner 1956) do not mention it. The type is at MCZ. It is the same with "*oscar*."

Unio oscar Wright 1892

= *ELLIPTIO PRODUCTUS* (Conrad)

Nautilus 5: 124; 1895, 19: 122, pl. 2, f. 3.

Type loc.: Lake Osceola, Winter Park, Orange Co., Florida.

Type lot: One paratype CM 61.11808, from Bryant Walker ex-Daniels Coll.) Type in ANSP; other paratypes in MCZ.

This form which Ortmann included within the *aheneus-hazelhurstianus* group is, like *waltoni*, merely a little more obese *E. productus*. The figure in Nautilus shows a specimen abnormally inflated and thickened by gerontism.

Elliptio dilatatus sterkii Grier 1918

= *ELLIPTIO DILATATUS DILATATUS* (Raf.)

Nautilus 32: 9. Ortmann 1919: 101, pl. 8, f. 3.

Type loc.: Big Bend (W. of waterworks), Presque Isle, Erie Co., Pennsylvania.

Type lot: Lectotype, here selected, a male, figured and marked *4 by Ortmann in 1919. Ten paratypes, 5 males and 5 females, CM 61.4648, coll. Ortmann, July 8, 1910.

Ortmann indicated this form as exclusive from Lake Erie, but other records in collection are from Detroit River and Lake Huron. It is only an ecological form of *dilatatus dilatatus*. Before sending the material for description to Grier, Ortmann labelled the specimens as "*Unio gibbosus* Barnes."

The lectotype is a medium size specimen, 7 years old; the larger paratypes are 13 to 15 years old, and darker.

QUINCUNCINA BURKEI Ortmann & Walker 1922

Nautilus 36: 3, pl. 1, figs. 1-4.

Type loc.: Sikes's Creek (tributary of Choctawhatchee River), Barbour Co., Alabama.

Type lot: Two paratypes from Pea River (5 miles W. of Elamville) Barbour Co., Alabama. CM 61.8623, coll. J. A. Burke, April 1915. Another paratype from Choctawhatchee River at Blue Springs, collected by H.H. Smith, May 12, 1915. These three specimens are smaller than the type (in MCZ). The genus *Quincuncina* was based mainly on the anatomy of our specimen from Blue Springs, although the shell type selected by Ortmann and Walker was from Syke's. The species is restricted to the Choctawhatchee drainage and recently Clench and Turner (1956) reported several localities from Alabama and Florida.

A N O D O N T I N A E

ARKANSIA WHEELERI Ortmann & Walker 1912

(= *ARCIDENS (ARKANSIA)* ?)

Nautilus 25 (9): 98, pl. 8.

Type loc.: "Old River" branch of Ouachita River, Arkadelphia, Clark Co., Arkansas.

Type lot: 3 paratypes, 2 collected by Wheeler, June 17, 1911; CM 61.5388, male and female; another, coll. June 26, CM 61.5257. There is also a topotype collected by Wheeler, after description, on Feb. 20, 1913, CM 51.6162.

The first three specimens, all about 5 years old, are very much like and approximately the same size as the type figured. The last one is older, about 7 to 8 years old, and 25% longer, with stronger sculpture and lateral teeth very rugose, recalling an *Arcidens* but with the umbonal features as in the other three. In all of them, the folds of the posterior slope are more marked than those in the figure of the type. It is not very unlikely that *Arkansia* might prove to be a subgenus of *Arcidens*. Other paratypes are in MCZ.

Anodonta subinflata Anthony, 1865

= *ANODONTA GRANDIS* Say

Amer. Jour. Conchol. 1: 160, pl. 15, f. 1 [sub-inflata].

Type lot: 2 paratypes from type loc. (from MCZ) CM 61.16013.

Van der Schalie, Clarke and other authors have remarked on the many ecological

phases of the protean *Anodonta grandis*, of which *subinflata* represents those of smaller size. Ortmann did not recognize subspecies in *grandis*, since all the variations are recurrent in distant areas of similar conditions; no defined geographical areas can be drawn for any of the forms.

Anodonta showalteri Lea, 1860

= *STROPHITUS SHOWALTERI* (Lea)

Proc. A.N.S.P. 1860: 307.

Type loc.: Big Prairie Creek, Hale Co., Alabama.

Type lot: One paratype collected by E. R. Showalter (from Alabama Geol. Survey Museum) CM 61.8377. Other 2 paratypes from J. Lewis (ex-Hartmann's coll.) 1898, pertaining to the original lot, received in 1902, CM 61.805. In two early labels Ortmann indicated: '*Anodontites ferussacianus*' and '*Strophitus edentulus*;' Walker who examined these specimens decided that *showalteri* is a distinct species. From the generic point of view, however, the conspicuous and well developed pseudocardinal places it, with all probability, within *Strophitus*.

ANODONTA BROOKSIANA van der Schalie 1938

Ann. Carnegie Museum 27 (12): 167, pl. 16, f. 1-3.

Type loc.: Spout Pond Arm, Ferryland District, Southern Shore, Newfoundland.

Type lot: Holotype and 160 paratypes from type locality, collected by S. T. Brooks, 1937 (originally they were of two lots collected on Sept. 17 and 21, but afterwards mixed). Other 74 paratypes from Long Run Pond. Many paratypes were distributed to different museums.

This is a species (or subspecies?) which has been found only in Newfoundland. By its acute angle of the posterior margin it stands between *marginata* and *grandis*; its thinness and fragility also recall *imbecillis*, but differing by its umbo which is not so flat and makes the dorsal line appear less straight; from *catatracta* it differs in the lack of rays and beak sculpture. According to the value of characters given to other species of *Anodonta*, it can be considered a species

of the same degree, but it also might represent a northeastern subspecies of *grandis*.

Lasmigona costata eriganensis Grier, 1918
= *LASMIGONA COSTATA* (Raf.)

Nautilus 32: (1): 10. Ortmann 1919: 131, pl. 9 f. 6 (emend. *eriganensis*)

Type loc.: Big Bend (W. of waterworks) Presque Isle Bay, Lake Erie, Erie Co., Pennsylvania.

Type lot: Lectotype, here selected, corresponding to the first specimen measured by Grier (90 X 46 X 31 mm.), and four paratypes, CM 61.4720, collected by Ortmann July 8, 1910. Other 8 paratypes, same locality, collected May 22, 1909, CM 61.4223.

The form *eriganensis*, as well as the species *costata* (*sensu lato*), is not a common shell in Lake Erie. Apart from those mentioned above, there are only five other lots from Michigan, and in 1962 Stansbery reported that *L. costata* was only known to him from Lake Erie by three specimens. The paucity of the materials makes the differences indicated by Grier more outstanding but, like many others which show different ecological phases between large rivers and headwaters, and between them and lake forms, it is unlikely that *eriganensis* should be considered an allopatric form.

ALASMIDONTINAE

Alasmidonta marginata susquehanna Ortmann, 1919

= *ALASMIDONTA MARGINATA* (Say)

Monograph: 187, pl. 12, f. 4.

Type loc.: Susquehanna River at Selin Grove, Snyder Co., Pennsylvania.

Type lot: One lectotype, male, here selected corresponding to the figured specimen, and 7 paratypes, collected Ortmann, Aug. 14, 1910; two males and 5 females.

Comparing numerous populations of *L. marginata* from eastern and western Pennsylvania, each showing many individual variations, it is not possible to draw a definite line between *marginata* s. s. and

susquehanna. Clarke and Berg (1959: 27) also found that the ratios "distance of beak to anterior end - length of shell" easily overlap when large populations are considered.

L A M P S I L I N A E

Nephronaias flucki Bartsch 1906

= *ACTINONAIAS FLUCKI* (Bartsch)

Proc. U.S.N.M. 30: 393, pl. 17, f. 2, pl. 18, f. 2; pl. 19, figs. 1, 2.

Type loc.: Wounta River, NW of Kukallaya, Nicaragua.

Type lot: Two paratypes collected and received from W.H. Fluck, smaller than the four specimens mentioned in original description (holotype, U.S.N.M. 64 X 27.7 X 17.6 mm.).

The explanation of the figures in the plates is not given in Bartsch's paper; *N. flucki* corresponds to fig. 2 in all plates; pl. 17, fig. 2, may be confused with fig. 1 which is *Diplodon huapensis* Bartsch (= *D. chilensis patagonicus* d'Orb.), but on pl. 18 the differences of their hinges are shown. Figure 3, in all the plates appear to me as entirely different either from *flucki* or from *huapensis*, and it is a shell of the *Actinonaias calamitarum* group, closer to *yzabalensis* F. & C. from Guatemala. Young specimens of *calamitarum* which are always more elongated than the adults, look sometimes like *flucki*.

For comments on the status of *Nephronaias* see next species.

Unio (Nephronaias) ortmanni Frierson, 1913
= *ACTINONAIAS CALAMITARUM ORTMANNI*
(Frierson)

Nautilus 27: 14; 28, pl. II.

Elliptio ortmanni (Frierson), Ortmann
Nautilus 35: 24.

Type loc.: Estancia Maya, on the Conchins River, Quirigua (Atlantic drainage), Guatemala.

Type lot: 24 syntypes collected by A. A. Hinkley on Feb. 4 and 6, 1913. CM 61. 6196 and 61.6197. The first lot is composed of 16 mostly adult shells, but smaller than the one figured; the others are 8, even smaller specimens, five females and 3 males; the smallest female (only 24 mm.) was gravid, and being only 29% of the adult size, indicates that the species began sexual activity very early in life.

The anatomy of *ortmanni* is like that of *Elliptio* (those of other species placed in *Nephronaias* are unknown). But, defining *Nephronaias*, Ortmann (1921) said that the anatomy in this group and *Obovaria* are undistinguishable "and all the differences are in the shells," and temporarily placed it within *Lampsilis*; later he said that *Nephronaias* becomes either a synonym of *Elliptio* or a subgenus of it.

The generic type of *Nephronaias* is *Unio plicatulus* Charpentier, but when the genus was created Fischer and Crosse (1900) declared that they had not seen that species, the reference taken from Küster's Conchylien Cabinet. Finally, Ortmann (1922: 147) decided that *Nephronaias* is a synonym of *Actinonaias* while Thiele places *Nephronaias* and *Simonaias* as sections of *Elliptio*.

Frierson's *ortmanni* agrees in all respects with *Unio calamitarum* (Morelet), although it appears more oval and less posteriorly quadrate; but *calamitarum* includes many variations, and Martens (Biol. Centr. Amer., 1901: 505) placed it under *cuprinus* Lea (= *metallicus* Say) which is unlikely. The type of *calamitarum* is from Palenque, Chiapas, Mexico, but the group of its related species ranges from Mexico to Nicaragua. I think that *Elliptio sayanus* and *E. haricoti* Frierson are forms of *calamitarum*.

Considered at most as a southern subspecies, the variations in the type lot of *ortmanni* include: forms from perfectly

oval to reniform; posterior margin subtruncated rounded or pointed; with or without green rays on the posterior slope; interior pearly white, sometimes salmon; exterior olive-green in young specimens, dark brown in gerontic ones. Constant characters: umbos somewhat flattened; deep concentric sulcation very regular in the young, reaching the tip of the umbo, rather rugose in adults; secondary pallial line very conspicuous, especially on the anterior side; pseudocardinals very strong; shell solid.

Unio borealis A. F. Gray, 1882

= *LAMPSILIS RADIATA* (Gm.)

Trans. Ottawa Field-Nat. Club, 1882: 53.

Type loc.: Duck Island, Ottawa River, Carleton Co., Ontario, Canada.

Type lot: one paratype from type loc. CM 61.9926, from Frierson (ex-Latchford coll.). Lectotype in MCZ. Another specimen, topotype, from A. La Rocque, 1937.

Lampsilis ventricosa cohongoronta Ortmann, 1912

= *LAMPSILIS OVATA* (Say)

Type loc.: Potomac River, Hancock, Washington Co., Maryland.

Type lot: one lectotype, here selected, male, CM 61.3999; 15 paratypes, all males; Ortmann separated the females in another lot CM 61.400, of which one is the allotype; all these were collected by Ortmann on Sept. 4, 1909, combining a single lot of 22 specimens. The form is also known from the Shenandoah River at its confluence with the Potomac (about 30 m. S. of Hancock).

Lampsilis ventricosa cohongoronta was neither fully described nor figured; its author never mentioned the form again in subsequent publications, but included *ventricosa* as a form - not subspecies - of *ovata*. The only author who apparently recognized the form in various places of the Potomac was Marshall (Nautilus 31, 32, 34). Ortmann had said that this form of *ventricosa* was 'out of place in the Potomac and

it was an artificial introduction, the glochidia being carried by fishes like the 'black bass' which in 1889 was introduced in the Shenandoah, and other fishes in the Potomac and the Chesapeake-Ohio canal in 1894. The reactions during adaptation may have caused the differences found with *ovata ventricosa*; since it could not have been evolved into a subspecies in such a short period. These mussels live long and Ortmann might have found specimens of the first introduced generation. Ortmann dropped the name, evidently for that reason. In 1919, when Ortmann recorded the localities in which he found *ovata ventricosa*, none of the Potomac or Shenandoah localities were listed. All this gives us occasion to ponder how many times such accidental introductions might have occurred with other forms, which systematists are sometimes so quickly moved to name as taxa.

Lampsilis fimbriata Frierson, 1907.

Nautilus 21 (8): 86, pl. 12 (two upper figures and lower left). (The first inner pages of vol. 21, numbers 8 and 8, said by mistake 'vol. 22.')

Type loc.: Valles River, San Luis de Potosi, Mexico.

Type lot: one paratype, male, CM 61.4496, collected by A. A. Hinkley (received from Frierson). Type in A. N. S. P.; 1 paratype in MCZ.

When Ortmann received the specimens he labelled them '*Lampsilis (Proptera)*', and later added another label under *Leptodea*. This species belongs to the *L. fragilis* group, which is very variable in thickness but is extremely thin. *Leptodea* Raf. 1820 (type by subsequent designation of Hermannssen 1847, *Unio leptodon* Raf.) has priority over *Paraptera* Ortmann 1911; *Lasmonos* Raf. is a synonym. The species described by Simpson in Dall 1908 as *Lampsilis (Proptera) salinasensis* is a synonym of *fimbriata*.

Lampsilis iridella Pilsbry & Frierson,
1908

= *VILLOSA* (*FRIERSONIA*) *IRIDELLA* P.
& F.

Nautilus 22 (8): 81 (figures in 21, pl.
12, 1907).

Type loc.: The same as *Leptodea fimbriata*.

Type lot: three paratypes, collected by
A.A. Hinkley (1906?). One male is 65 mm.
long; the smaller 37 mm.) Type in ANSP.

Friersonia was founded on the anatomy,
especially the pointed posterior of the
marsupium and the recurved ovisacs. Re-
garding the inner laminae of the inner
gills connected with the abdominal sac,
the feature is the same as in *Villosa*.
The shell, Ortmann observed, "shows nothing
very characteristic." In the paratypes
at hand I found remarkable similarities in
shape, internal and external color, rays,
lines of growth seen on the inside, with
Villosa iris. Beak sculpture is the same
in *Friersonia* and *Villosa*, although some-
what accentuated in the first.

Micromya Agassiz 1852 was preoccupied
for Insects, and replaced by *Villosa* (Fri-
erson) by Clench and Turner 1956, with
Unio villosa Wright as type. Taking into
consideration the light anatomical differ-
ences, *Friersonia* should be ranked as a
subgenus rather than a genus, with south-
ernmost distribution.

Micromya ortmanni Walker, 1925
= *VILLOSA ORTMANNI* (Walker)

Occ. Papers MZUM 163: 1, pl. 1, figs.
1-6.

Type loc.: Green River, Mammoth Cave,
Kentucky.

Type lot: one paratype, female, from
type loc. CM 61.11246, collected Ortmann
1921. Other two lots, 2 females and 2
males from Great Onyx Cave, Edmondson Co.

also collected by Ortmann in 1922; and 3,
1 male and 2 females from Barren River,
Bowling Green, Warren Co., Ky. collected
in 1924. All these materials were men-
tioned by Walker in the description and
considered paratypes.

Truncilla walkeri Wilson & Clark 1914
= *DYSNOMIA WALKERI* (W. & C.)

Bureau of Fish. Docum. 781: 46.

Type lot: four paratypes (2 males and 2
females) from Bryant Walker Coll., CM 61.
6769. This lot was labelled by Ortmann
Dysnomia florentina walkeri.

The species *florentina* differs consider-
ably in its smaller size, short, very
solid, stout and very inflated shape, with
larger umbonal area. *D. walkeri*, instead,
is transitional between *D. rangiana* and *D.*
capsaeformis, closer to the first by its
colors, internal and external, and to
second approaches by its shape, especial-
ly when large specimens are compared; it
is, nevertheless, a form distinct from
these two, and the valuable characteris-
tics are of the same degree as those used
to distinguish among other species of *Dys-*
nomia.

It would require a discussion beyond
the scope of this paper to decide upon the
subgeneric position of this *Dysnomia*, a
matter on which a great deal of confusion
prevails. The differences among the seven
or more subgenera which have been named,
by Rafinesque, Simpson, Ortmann, and Fri-
erson, all appear to me not much above
their specific values. There is also the
question of priority between *Dysnomia* Ag-
assiz 1859 and *Epioblasma* Rafinesque 1831;
the revival of *Epioblasma* by Frierson in
1914 was accepted by Thiele 1935; Ortmann
has said (1922: 71) that *E. biloba* Raf.,
as type of *Epioblasma*, was unrecognizable,
but afterwards he and other authors placed
biloba as a synonym of *foliata-flexuosa*

(type of *Dysnomia*); it is obvious that any species name must be recognized before it is placed into synonymy. Since *nomen nudum* do not preoccupy or synonymize. However, the name *Epioblasma* had not been used for 83 years before Frierson tried to revalidate it, while the better known *Dysnomia* was recognized by Simpson 1900, Walker 1918, Ortmann 1922 and Modell 1964. We have here, an identical case as that of *Crenodonta* versus *Amblyma* (of which, fortunately, the I.C.Z.N. decided, 1965, that *Amblyma* should be the valid name). It is desirable that *Epioblasma* be declared a *nomen oblitum*.

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