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SYNOPSIS

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OF THE

FAMILY OF NAIADES.

BY

ISAAC LEA,

MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY,
ETC., ETC.

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INTRODUCTION.

THIS systematic arrangement and synonymy was communicated to the American Philosophical Society in July last nearly in the form in which it is now printed. It was undertaken purely with the view and in the hope of clearing away the difficulties which had incumbered one of the most interesting families of the Mollusca. In this attempt the author met, while pursuing his task, with obstructions and difficulties which he little anticipated at its commencement. The want of some of the books of reference, and the confusion which reigned throughout many of them, sometimes presented obstacles which seemed almost insurmountable. In attempting to establish the synonymy, he has endeavoured to render the strictest justice, and if in any case it is found he has failed to do this, it will be a matter of sincere regret to him.

In the following tables there will be found in the family 300 recent species as admitted, 22 as doubtful, and 22 fossil; in all 344.

Of the sub-genus *Unio* there are 226 species in a recent state, and 14 which I have not been able to admit as certain; of fossil species 21.

Of the sub-genus *Margaritana* there are 14 admitted species, and 2 which are unknown to me.

Of the sub-genus *Dipsas* I know of but two species, both of which are recent.

Of the sub-genus *Anodonta* there are 50 admitted species, and 6 which are unknown to me. Of fossil species there is one which is doubtful.

Of the sub-genus *Pleiodon* there is but one species, and that recent.

The genus *Iridina* has 7 species, all recent.

LIST OF AUTHORS.

The following authors are quoted, and their names chiefly abbreviated :—

<i>Bosc.</i>	<i>Gray.</i>
<i>Bouil.</i> —Bouillet.	<i>Green.</i>
<i>Blain.</i> —Blainville.	<i>Grat.</i> —Grateloup.
<i>Bar.</i> —Barnes.	<i>Grono.</i> —Gronovius.
<i>Brug.</i> —Bruguère.	<i>Gmel.</i> —Gmelin.
<i>Ben.</i> —Benson.	
	<i>Hild.</i> —Hildreth.
<i>Crouch.</i>	<i>Humph.</i> —Humphreys.
<i>Con.</i> —Conrad.	
<i>Chem.</i> —Chemnitz.	<i>Klein.</i>
<i>Caill.</i> —Cailliaud.	<i>Knorr.</i>
<i>Cooper.</i>	
	<i>Lam.</i> —Lamareck.
<i>Dill.</i> —Dillwyn.	<i>Lesueur.</i>
<i>Desh.</i> —Deshayes.	<i>List.</i> —Lister.
<i>Drap.</i> —Draparnaud.	
<i>Des Moul.</i> —Des Moulins.	<i>Mort.</i> —Morton.
<i>Don.</i> —Donovan.	<i>Mich.</i> —Michaud.
<i>Den.</i> —Denham.	<i>Monta.</i> —Montagu.
	<i>Mat.</i> —Maton.
<i>Eat.</i> —Eaton.	<i>Mühl.</i> —Mühlfeld.
	<i>Menke.</i>
<i>Fer.</i> —Ferussac.	
<i>Flem.</i> —Fleming.	<i>Nil.</i> —Nilsson.
<i>Fork.</i> —Forkeil.	
<i>Far.</i> —Farines.	<i>Poir.</i> —Poiret.

Pfeif.—Pfeiffer.*Poli.**Pay.*—Payraudeau.*Phil.*—Phillips.*Retz.*—Retzius.*Rav.*—Ravenel.*Ross.*—Rossmaeler.*Raf.*—Rafinesque.*Shep.*—Shepherd.*Speng.*—Spengler.*Stud.*—Studer.*Schmidt.**Schroet.*—Schroeter.*Solan.*—Solander.*Sow.*—Sowerby.*Schum.*—Schumaker.*Spix.**Swain.*—Swainson.*Say.**Turt.*—Turton.*Valen.*—Valencienes.*Wag.*—Wagner.*Wood.**Yoldi.**Zeig.*—Zeigler.

SYNOPSIS
OF
THE FAMILY NAÏADES.

MOST of the distinguished authors who have written on the subject of the division of the Family *Naïades* of Lamarck, have acknowledged the extreme difficulty they have encountered in separating it into subdivisions. This difficulty is not peculiar to the *Naïades*. In most of the families where a great number of species have been observed, we find the species so merging, and in some of their characters so fading away into each other, that we scarcely know how, indeed in some instances it is impossible, to make the separation with precision. “*Natura non facit saltum.*” In the vegetable kingdom the same obstructions to a system are encountered. The observations of Lindley* are so just and philosophic, that I cannot refrain from quoting them here:—

“Species are created by Nature herself, and remain always the same, in whatever manner they may be combined: they form the basis of all classification, and are the only part of it

* See Intro. to Botany, p. 307.

which can be considered absolute. For although in a natural system, all other combinations, whether genera, tribes, orders, or by whatever name they may be known, comprehend species agreeing much more with each other than with anything else, and having a positive general resemblance in the majority of their features, yet no fixed limits can be assigned to any of them; on the contrary, they pass, by means of various intermediate species, into the other genera, tribes, orders, &c., to which they are most nearly allied. For this reason, viz., that no fixed limits can be assigned to orders, genera, &c., we find the ideas about them fluctuating with the degree of our knowledge; which is the true cause of those changes in the limits of genera, &c., which persons unacquainted with the subject are apt to consider arbitrary; but which, in skilful hands, are dependent upon a progressive advance in the knowledge of science."

Blainville, in his "Manuel de Malacologie," divides the *Naïades* (his *Sub-mytilacea*) into *Anodonta* and *Unio*, but thinks that species will be found which will make these to be united.*

Sowerby says, "the difficulty of ascertaining to which genus of Lamarekian *Naïades* certain species belong, arises from the very general similarity of form," &c.; "in fact, an examination of a sufficient number of species will prove that no dependence can be placed upon the characters by which authors usually attempt to discriminate between these genera, and that the transition from one to another is so gradual in some instances, and so strongly marked in others, that it is not sur-

* See page 540.

prising that authors who having only met with certain species, and not being aware of such intermediate links, should have considered them as the types of new genera.”* And further, “we think we have already said enough to prove, that unless it be thought wise to elevate each of the peculiar sorts we have mentioned, and many more, into distinct genera, it will be positively necessary to unite them altogether under one generic appellation.” Swainson (Zool. Illus. second series,) divides this family into *Unio*, *Hyria*, *Iridina*, *Anodon*, and *Alasmodon*, but in describing *An. ariolatus* speaks of the genera gliding into each other.

Deshayes, in his edition of “Lamarek’s Animaux sans Vertebres,” says it is impossible to separate the genera of the *Naïades*. “Nous pourrions prendre pour exemple celui des genres qui est considéré comme l’un des mieux caractérisés. Le genre *symphynote* est fondé sur ce caractere remarquable que les deux valves sont soudées entre elles le long du bord superieur,” etc. “Nous concluons que tout ce grand ensemble ne peut et ne doit former qu’un seul genre constituant a lui seul la famille des *Nayades*.”†

* Zoolog. Jour. Vol. I.

† Vol. VI. p. 526.—I will be excused in taking this opportunity to correct an erroneous impression on the mind of M. Deshayes. He says I was not able to examine the collection of the museum of Paris. “Malgre cette imperfection qu’il ne pouvoit empecher, le travail de M. Lea se recommande a l’attention des naturalistes par ces observations judicieuses, des descriptions exactes,” etc. It would be strange indeed, if after spending so many years in the study of this family, that I should neglect, while in Paris, to see the collection from which Lamarek made so many descriptions. I was frequently at the museum, and on one particular occasion, by appointment of MM. Blainville and Ferussac, arranged in the presence of these and other gentlemen all the species of the *Naïades* that were in the museum, and named them; and also presented to the museum about fifteen species which were not there. I also did the same thing for Baron Ferussac, having designated every specimen in his cabinet belonging to this family.

It might be expected that some attempt of the application of M'Leay's circular system should be made in regard to this family. Swainson says that "the progression of every natural series is in a circle."* In my attempts to prove this, I have not been successful. That the same idea exists in the construction of species is evident through a great number, but that this idea is returned to the point at which it commenced I am not prepared to assent to.

To form a systematic, and so far as possible a natural arrangement of this family has long occupied my serious attention.

I was, from my first knowledge of the family, struck with the very different aspect of the winged species, and taking the hint of Lamarek,† I thought that an important division could be made by separating the connate from the free shells, and proposed the name of *Symphynota* for such as were connate. I was not satisfied at that time in separating a genus of this family by a character differing from that of the teeth, but presumed that the family would be taken up by some one, if not by myself, and that the first division of it would be symphy-note and non-symphynote *Naiades*. The numerous new species which have been made known since, have satisfied me that this character cannot be so extensively and usefully applied as I then thought it could, and that it is not in fact free from the same objection which pervades so many generic characters as adopted by the most intelligent naturalists, viz.,

* Swainson, in Lard. Cycl. Nat. Hist. p. 247.

† Vol. VI. p. 76.

that perfect fading and mingling of character which interferes with all the systems yet formed.

Sowerby, after examining into the propriety of dividing the family into genera, came to the conclusion of keeping but one genus, viz. *Unio*: this he divided into A without teeth, B with teeth. These he subdivided into winged and not winged. Another subdivision followed these, on the presence, form and absence of teeth. There is evidently much merit in this division; but it is not perfect; nor ought we to expect perfection, I believe, in any system. Ferussac informed me when in Paris that he proposed to consider the Family *Naïades* to consist of one genus, *Margatifera*, which genus he divides into the following subgenera: 1. *Anodonta*, 2. *Iridina*; 3. *Dipsas*; 4. *Triquetra*;* 5. *Alasmodonta*; 6. *Unio*.

After mature reflection, I have come to the conclusion, in forming this systematic arrangement and catalogue, to divide the family into two genera, *Margarita* and *Iridina*, and the first into *subgenera*. In the fact, as we are informed by M. Deshayes, that *Iridina* possesses tubes, I think, although the form of the dorsal margin of the valves is without teeth, as in the *Anodonta*, it must be considered a distinct genus from *Unio*, which we must recollect like *Anodonta*, &c. forms two temporary tubes with the posterior edge of the mantle which is fringed with cilia or palpi, serving to determine the direction of the jet of water which flows in a constant stream through the superior temporary tube. Under this system, the

* Klein. This it would appear Baron F. intended should embrace my genus *Symphynota*, as he included all he knew of them except *S. bialata*.

best place for the Symphynote shells would be a division of the subgenera into Symphynote and Non-Symphynote.

FAMILY NAIADES.	I. GENUS MARGARITA.	1. Subgenus Unio,	{ Symphynote—Unio alatus, ^a &c.
		Having a cardinal and lateral tooth.	{ Non-Symphynote — Unio pictorum, ^b &c.
		2. Subgenus Margaritana,	{ Symphynote — Alas. complanata, ^c &c.
		Having one tooth (cardinal).	{ Non-Symphynote— Alas. undulata, ^d &c.
		3. Subgenus Dipsas,	{ Symphynote — Dipsas plicatus. ^e
		Having a linear tooth under the dorsal margin.	
	II. GENUS IRIDINA.	4. Subgenus Anodonta,	{ Symphynote — Sym. magnifica, ^f &c.
		Having no teeth.	{ Non-Symphynote — An. fluviatilis, ^g &c.
		5. Subgenus Pleiodon,*	{ Non-Symphynote — P. Macmurtriei. ^h
		Having the dorsal line granulate.	
		NOTE.—It should be remarked here that this genus is not used on Lamarck's character, "charnière tuberculeuse dans sa longueur," but with that of the animal's having tubes, otherwise it must go with the subgenus <i>Anodonta</i> . I believe that the same species may be observed with and without a tuberculated hinge.	

* A new genus proposed by Mr. Conrad for a beautiful shell from Liberia.

^a Of Say.

^b Of Lamarck.

^c Of Barnes.

^d Of Say.

^e Of Leach. Only two species yet known, this and *S. discoidea*, Lea.

^f Lea.

^g *Mytilus fluviatilis*, Sol. Dill. &c. *An. cataracta*, Say.

^h Conrad. In the text this name is *Macmurtriei*: that of the plate is most correct.

After the divisions of Symphynote and Non-Symphynote shells, we have what appears to me four very natural subdivisions, viz. :

1. Plicate shells.*
2. Nodulous shells.†
3. Spinous shells.‡
4. Smooth shells.§

Each of these subdivisions may be again separated according to the form of their outline, thus :

1. Quadrate.^a
2. Triangular.^b
3. Oblique.^c
4. Oval.^d
5. Oblong.^e
6. Subrotund.^f
7. Wide.^g
8. Obovate.^h
9. Arcuate.ⁱ

The shell is supposed to be lying on its side with the liga-

* As *Unio plicatus*. *Lesueur*.

† As *Unio pustulosus*. *Lea*.

‡ As *Unio spinosus*. *Lea*.

§ As *Unio complanatus*. (*U. purpurcus*. *Say*.)

No regard of course is paid in this division to the folds or undulations of the beaks, as all the species are more or less disposed to this character.

^a As *U. asperrimus*. *Lea*.

^b As *U. triangularis*. *Barnes*.

^c As *U. clavatus*. *Lam*.

^d As *U. crassus*. *Say*.

^e As *U. complanatus*. *Solander*.

^f As *U. circulus*. *Lea*.

^g As *U. rectus*. *Lam*.

^h As *U. modioliformis*. *Lea*.

ⁱ As *M. margaritifera*. *Al. arcuata*. *Barnes*.

ment furthest removed from the observer, and the beak to the right of it. The base will of course be nearest to him, and the anterior margin to his right, while the posterior margin will be to the left. This is my mode of arranging my whole cabinet.

In attempting to make a complete synopsis of the *Naiades*, much labour has necessarily been bestowed upon it. I do not present this as a perfect work, but as much so as I could with the opportunities in my possession make it. Errors may have arisen from two sources: first, default of judgment; second, accidental, owing to the mass of research necessary to accomplish the object, considering the crude state the subject was in. I shall be most agreeably disappointed if there be not parts pointed out as erroneous which are substantially correct. It will be observed that the works of M. Rafinesque are but little quoted. This has arisen from the utter impossibility of satisfying myself as to his species. The cause of which was, at an early period, the abandonment of pursuing the impracticable task of making them out. His own discrepancy in the names sent to Ferussac,* and those which are attached to specimens here, together with the want of accordance in the tables made out by his friends, have induced me to regard his claims as being too slender to rely upon the decisions, so contradictory of the several parties, in the ab-

* "Les erreurs involontaires qui échappent à M. Rafinesque dans ses envois augmentent aussi la difficulté de reconnaître ses espèces. Nous avons reçu de lui les mêmes coquilles sous différents noms, et d'autres avec les noms évidemment autres que ceux qu'elles portent dans sa Monographie. Il en est résulté une difficulté inextricable pour la détermination de ses espèces, et pour pouvoir établir une synonymie exacte entre lui et les autres qui, depuis, se sont occupés des Mulettes."—*Observations*, p. 13.

sence of the individual specimens noted. In the absence of these specimens, which no naturalist has, I believe, ever seen but the Professor, I feel myself compelled to prefer other authorities which are now almost universally received by our men of science. I am the more fortified in this conclusion, when I see that his most ardent advocate acknowledges that he has made six species from a single one;* and the absurdity is still stronger when we turn to Prof. R.'s monograph, and find that this single species has furnished *several genera*, and is placed in fact in *two different sub-families!!!*

In regard to the Catalogue published last year by Baron Ferussac, in which he gives precedence to many of Professor Rafinesque's names, it must be remembered that this has been done on the authority of others, and not from the inspection of the subjects themselves. Had he known the manner in which these claims had now been brought forward, he certainly would have admitted them with doubt. It will be observed that I have inserted in this "Synopsis" many new species which may not be recognized at once as mine. These are contained in my late Memoirs read at various times before the American Philosophical Society, and will, I hope, shortly appear in its Transactions.

* Conrad's Synoptical Table on New Fresh Water Shells of the United States, p. 72. *U. triangularis*.

FAMILY NAIADES, *Lamarck*.

GENUS MARGARITA.

Subgenus Unio.

SYMPHYNOTE UNIONES.	}	PLICATE.	}	TRIANGULAR.
				angulatus. <i>Lea</i> .*
				Hyria corrugata.† <i>Lam.</i> <i>Sow.</i>
				Mya angulata. <i>Wood.</i>
				Unio corrugata. <i>Blain.</i>
				Unio rugosus. <i>Wagner.</i> ‡
				Paxyodon ponderosus. <i>Schum.</i>
				Triptodon rugosus. <i>Spix.</i> ‡
				gigas. <i>Lea.</i>
				Lymnadia gigas. <i>Swain.</i>

* It will be observed, throughout this *Synopsis*, that where any change has been made of generic or specific names, that I have placed my name there. This is not done with a view to claim any merit, but in accordance with that which is usually done. The object is to show the author of the change, and nothing further.

† This specific name having been used by the older conchologists, as well as Lamarck, for a shell from India, (*Unio corrugata*,) it becomes necessary, as I retain that as the older, to change this, which I do, to Wood's name.

‡ On the authority of Ferussac.

TRIANGULAR.

inflatus. *Lea.*Symp. inflata. *Lea*, in Trans. Am. P. S.alatus. *Say.*Unio alatus. *Say. Lam. Swain. Bar. Hild.*Mya alata. *Wood.*Symp. alata. *Lea*, Trans. Am. P. S.syrmatophorus. *Lea.*Mya syrmatophora. *Gronovius. Gmel.**Wood. Dill.*Hyria avicularis. *Lam. Crouch.*Hyria syrmatophora. *Sow.*Hyria elongata? *Swain.*Unio caudatus.* *Wagner.*Prisodon obliquus. *Schum.*Prisodon truncatus. *Schum.*Diptodon fuscum.* *Spix.*lævissimus. *Lea.*Symp. lævissima. *Lea*, in Tr. A. P. S. *Eaton.*Unio lævissima. *Deshayes.*gracilis. *Barnes. Hild.*Unio planus. *Barnes.*Unio fragilis. *Swain.*Symp. gracilis. *Lea*, in Tr. Am. P. S. *Eaton.*compressus. *Lea.*Symp. compressa. *Lea*, in Trans. Am. P. S.

* On the authority of Ferussac.

NON-SYMPHYNOTE UNIONES.

PLICATE.

QUADRATE.

Nicklinianus. *Lea.*

cœlatus. *Con.*

multiplicatus.* *Lea.*

Unio heros. *Say*, in Disseminator.

Unio undulatus. *Say*, Am. Conch. No. 2.

Deshayes.

Unio heros. *Say*, Am. Conch. No. 6.

undulatus. *Bar. Valen. Hild. Desh.*

Unio costata? *Raf.*

Unio costatus. *Con.*

plicatus. *Lesueur. Say. Bar. Eat. Hild.*

Unio Peruviana. *Lam.*

Unio rariplicata. *Lam.*

Unio Dombeyanus. *Valen.*

Unio undulata. *Desh.*

Unio multiplicata. *Desh.*

trapezoides. *Lea.*

Unio crassidens. *Lam. Var. a.*

Unio interruptus.† *Say.*

* When I described the *multiplicatus* in 1830, I had had several specimens for two or three years, and was not aware that Mr. Say had published a shell under the name of *heros*, which he subsequently abandoned as the *undulatus* of Barnes; but in 1834 reclaimed as *heros*. I consider that Mr. Say's abandonment of the species entitles me to it, if my previous claim be not sufficient.

† Mr. Say, in his "Synonymy," claims precedence in this species, although

TRIANGULAR.

ambiguus. *Lea.*Castalia ambigua. *Lam.*Unio ambigua. *Blain. Desh.*Mya ambigua. *Wood.*foliatus.* *Hild.*Unio flexuosa? *Raf.*Unio flexuosus. *Con.*, in text, Monograph,
page 8.Unio foliatus. *Con.*, in plate 4, Monograph.

OVAL.

pliciferus. *Lea.*

WIDE.

multistriatus. *Lea.*subtentus. *Say. Con.*Conradicus. *Lea.*

my Memoir bears date May, 1830, while his is December, 1831. (See *Transylvania Journal*, Vol. V.) The reader will not after this be surprised to be told that Mr. Say does not allow me, in his very incorrect "Synonymy," to be the discoverer of a single new species of *Unio* from our western waters!! I may be allowed also to state, that I do not understand why he gives the same name to two of his different numbers: thus, he calls No. 17, *U. interruptus*, Rafin.; and No. 47, *U. interruptus*, Say. The species are evidently distinct.

* The male of *foliatus* is certainly a triangular shell—the female differs in form very much, having a deep inflection on the posterior basal margin. It may be doubted if this should be considered a plicate shell. I consider that the folds of the growth, particularly in the male shells, requires it to be placed there.

NON-SYMPHYNOTE UNIONES.	PLICATE.	WIDE.
		acutissimus. <i>Lea.</i>
		Merchisonianus. <i>Lea.</i>
		Unio Douglasiæ? <i>Gray.</i>
		Grayanus. <i>Lea.</i>
		ARCUATE.
	NODULOUS.	ponderosus. <i>Lea.</i>
		Mya ponderosa. <i>Solan. Dill.</i>
		Mya crassa. <i>Wood.</i>
		QUADRATE.
		lacrymosus.* <i>Lea.</i>
		asperrimus.† <i>Lea.</i>
		Unio quadrulus. <i>Say.</i>
		fragrosus.‡ <i>Con.</i>

* It is a matter of some doubt, if this be more than a beautiful variety of *asperrimus*, (nobis.) Future observation must determine. Ferussac and some other zoologists think it is distinct.

† Mr. Say supposed this to be the *rugosus*, Barnes. Two specimens referred to by Mr. B. as *rugosus* were under my inspection, and proved to be—the one a flat *metanevra*, Rafin., the other a *plicatus*, (Lesueur.) Mr. B. in his reclamation, recognises his *rugosus* as *U. Peruviana*, Lam., which shell is undoubtedly the *plicatus*, (Lesueur and Say.)

‡ This shell has been considered the female of *asperrimus*, (nobis,) but I am, after the examination of many specimens, disposed to think it to be distinct. Some of our best western naturalists think it to be the true *rugosus* of Barnes.

NON-SYPHYNOTE UNIONES.

NODULOUS.

QUADRATE.

Phillipsii. *Con.*pustulatus. *Lea.*Schoolcraftensis. *Lea.*Unio prasinus. *Con.*

TRIANGULAR.

apiculatus. *Say.*asper. *Lea.*stapes. *Lea.*metanevra. *Lea.*Unio metanevra. *Raf.*Unio nodosus. *Bar.*Unio rugosus. (Flat) *Bar.*Unio metanevrus. *Con.*cornutus. *Bar.*Unio reflexa? *Raf.*Unio reflexus. *Con.*

SUBROTUND.

pustulosus. *Lea.*Unio verrucosus. *Bar. Var. b.*Unio verrucosa. *Valen.*

NON-SYMPHYNOTE UNIONES.

NODULOUS.

SUBROTUND.

Unio verrucosus albus. Say; but not of *Hildreth*.*

turgidus. Lea.

Unio Mortoni. Con.

Cooperianus. Lea.

verrucosus. Bar. Eat.

Unio tuberculata? Raf.

Unio tuberculosa. Valen.

Unio verrucosus purpureus. Hild.

Unio tuberculatus. Con.

nodulosus. Lea.

Mya nodulosa.† Wood. Dill.

irroratus. Lea. Eaton.

Unio verrucosus albus. Hild.

dromas. Lea.

* A specimen sent to me by Dr. Hildreth as *Unio verrucosus albus*, proved to be a true *irroratus*, (nobis.)

† This shell, as figured by Wood in his "General Conchology," seems to me to be distinct from the *pustulosus*, (nobis,) with which it has been confounded. The figure of Wood is longer than any *pustulosus* I have seen, and the epidermis is much darker, ("bottle green.") The nodules are more numerous about the beaks, and the lateral tooth is longer and thicker. I doubt if the *nodulosus* be an American species.*

NON-SYMPHYNOTE UNIONES.

NODULOUS.

OBLIQUE.

*Æsopus. Green.**Unio cicatricosus. Con.; not of Say.**Unio varicosus. Con.; not of Lea.**varicosus. Lea.**Unio cicatricosus? Say.***perplexus. Lea.**Unio gibbosus? Raf.**Unio gibbosus. Con.*

WIDE.

*Leaii. Gray.**granosus. Brug. Lam.**tuberculatus. Bar. Eat. Hild.**Novæ Hollandiæ. Gray.**cylindricus. Say. Eat. Hild.**Unio naviformis. Lam. Blain. Valen.*

SPINOUS.

spinosus. Lea.

* Never having seen the specimen described by Mr. Say as *cicatricosus*, I am unable to decide if it be the same with *varicosus*, (nobis.) Two things mentioned by Mr. Say induce me to doubt it. He calls his "a common species," and says it is "distinguishable by the single series of transverse elevations on the middle." The latter remark does not apply to *varicosus*, and I have always deemed it a rare shell.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	QUADRATE.
		arcæformis. <i>Lea.</i>
		Unio nexus.* <i>Say.</i>
		TRIANGULAR.
		triangularis. <i>Bar. Eat. Hild. Say.</i>
		Unio formosus.† <i>Lea.</i> (Male.)
		Unio cuneatus. <i>Swain.</i>
		elegans.‡ <i>Lea.</i>
		donaciformis.§ <i>Lea.</i>
		zigzag. <i>Lea. Eat.</i>
		heterodon. <i>Lea.</i>

* Say and Conrad both commit the error of giving precedence to *nexus*. My description of *arcæformis* is in my memoir, read before the American Philosophical Society, May 20, 1831, while Mr. Say's was first described in the Transylvania Journal of December 1831. Subsequently he republished it in his American Conchology, No. 6, where he places erroneously the date of 1832 to my memoir.

† Mr. Barnes's description of *triangularis* was made from a female shell, and mine from the male. There being an obvious distinction of the sexes in every specimen, my error was a very natural one, as we had no idea at the time of sexual differences in the *Naiades*.

‡ Mr. Say thinks that Mr. Barnes's *undulatus*, Var. *a.*, is the same with *elegans*. I think differently, and would fortify my opinion in the fact, that Mr. B. does not mention the zigzag rays which are strikingly singular in the *elegans*, and could not have failed to have elicited his remarks had it been under his eyes.

§ I have expressed my doubts, Transactions of the American Philosophical Society, Vol. IV., page 84, (page 94 in "Observations on the Genus Unio," &c.) if this be more than a fine variety of *zigzag*, (nobis.) Mr. Say gives it as a synonym to *nervosus*, Raf., and Mr. Conrad as *truncata*, Raf.

NON-SYPHYNOTE UNIONES.

SMOOTH.

TRIANGULAR.

penitus.* *Con.*

securis. *Lea. Eat.*

Unio depressa.† *Raf.*; but not of *Lam.*

camelus. *Lea.*

ovatus. *Say. Lam. Bar. Valen. Eat.*

Hild. Con.

Unio ventricosus. Desh.

Unio subovatus. Desh.

Unio occidens. Desh.

subovatus.‡ *Lea.*

crassidens.§ *Lam.*

Unio cuneatus. Bar. Eat. Hild.

Unio niger? *Raf.*

Unio niger. Con.

carbonarius. *Lea.*

* I received from Judge Tait of Alabama, in 1830, several specimens of this species, but they were not sufficiently perfect to induce me to publish them. Mr. Conrad does not mention the rays, a very peculiar character of which is their being dotted somewhat like those of *securis*, (nobis,) but in a lighter manner.

† Mr. Conrad makes *depressa*, Raf., *ellipsaria*, Raf., and *securis*, (nobis,) synonymous with *lineolata*, Raf. Mr. Say does the same, with the exception of *ellipsaria*, which he considers distinct; while Mr. Rafinesque himself places *lineolata* and *ellipsaria* in different subgenera!!

‡ Mr. Say makes "*ventricosus*, Bar., *occidens*, (nobis,) *subovatus*, (nobis,) (var.), and *capax*, Green, (var.)," synonymous with *cardium*, Raf. In my opinion they form at least three, perhaps four distinct species.

§ *Crassidens*, Var. *a*, Lam., is *trapezoides*, (nobis.)

NON-SYMPHYNOTE UNIONES.

SMOOTH.

TRIANGULAR.

gibber. *Lea.*pumilis. *Lea.*rubiginosus. *Lea.*Barnesianus. *Lea.*pileus. *Lea.*Sowerbianus. *Lea.*solidus. *Lea.*obliqua. *Lam.*Unio undatus. *Bar.*Unio trigonus.* *Say and Con.*; not of *Lea.*Unio mytiloides. *Eat.*Unio undulatus. *Desh.*Unio cordatus? *Raf.*Unio cordatus. *Con.*

* Say and Conrad both give *trigonus* (nobis) as a synonym to *undatus*, Barnes. It is difficult for me to understand why they should not at once on comparison be recognised as different species. The *trigonus* is always more angular on the umbonial slope, and the undulations at the tips of the beaks differ. This may be observed particularly in the young and perfect specimens. If a doubt could be admitted as to the difference of the form of the shell, the colour of the animal in *trigonus* would at once settle the question. It is peculiar, and differs from all the species I know in being of so deep a colour as to be almost red.

Some years since, when I described this species, I deposited a specimen in the Academy of Natural Sciences of this city, with its proper name appended. Subsequently, I found the Academy had prefixed the name of *undatus*, Barnes, to the label, and I presume this error is still continued there.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

TRIANGULAR.

pyramidatus. *Lea.*Unio rubra? *Raf.*Unio mytiloides. *Con.*mytiloides.* *Raf.*Mya obliqua. *Wood.*

OBLIQUE.

Troostensis. *Lea.*Unio trabalis. *Con.*Tigris. *Fer.*Taitianus. *Lea.*cor. *Con.*truncatus. *Swain.*decisus. *Lea. Con.*

* The difficulty of recognising Mr. Rafinesque's species is well illustrated in this one. Mr. Conrad considers *triangularis*, Raf., as the type, and gives the following names of the same author as synonyms, viz.: *lateralis*, *sintoxia*, *pachostea*, *mytiloides*, and *rubra*; thus charging him with making six species of one. But what is still more extraordinary, this single species, (agreeably to Mr. Conrad's synonyms,) is not only divided by Mr. R. into *different subgenera*, but into *different genera*, and even into two DIFFERENT SUBFAMILIES!! See New Fresh Water Shells of the United States, p. 72. and Mr. Rafinesque's "Monographie." In Mr. Say's "Synonymy," *triangularis*, Raf., is considered to be the same as *ellipsis*! (nobis.)

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OBLIQUE.

clavus. *Lam. Con.*

Unio scalenia. *Raf.*

Unio modioliformis. *Say*; not of *Lea.*

patulus. *Lea.*

Ravenelianus.* *Lea.*

sulcatus. *Lea. Eat. Say.*

Unio ridibundus. *Say. Eat.* (Female.†)

Haysianus. *Lea.*

ellipsis.‡ *Lea. Eat.*

castaneus. *Lea.*

OVAL.

Tampicoensis. *Lea.*

* Mr. Conrad has subsequently published a different species under this name.

† For some years I was satisfied that Mr. Say's *ridibundus* was only a variety of *sulcatus*, (nobis.) There cannot now, however, scarcely be a doubt but that it is the female of that species; but it must be remarked, that this serrated shell is usually found smaller than the other; a circumstance not common with the females of other species. Mr. S. describes and figures *ridibundus* in No. 1 of "American Conchology," but does not insert it in his "Synonymy" in No. 6.

‡ Mr. Say, in his "American Conchology," refigures this, and recognizes my name. Subsequently, in his "Synonymy," he makes it a synonym of *triangularis*, Raf. Mr. Conrad says it is *olivarius*, Raf.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

Lecontianus. *Lea.*perdix. *Lea.*pectorosus. *Con.*ventricosus. *Bar.*occidens.* *Lea.*Unio ventricosus. *Say.*globosa. *Lea.*Sym. globosa. *Lea*, Trans. Am. Phil. Soc.Unio capax? *Green.*ochraceus. *Say. Con.*Sym. ochracea. *Lea*, Trans. Am. P. S.splendidus. *Lea.*cariosus. *Say. Bar.*Unio cariosa.† *Lam.*Unio ovata. *Valen.*Unio luteola. *Con.*; not of *Lam.*perovatus. *Con.*

* This and the preceding shell are so nearly allied, that it is a matter of doubt with me if it would not be preferable to unite them. Subsequent examination may throw sufficient light upon them to decide with certainty. Among Mr. Barnes's varieties of *ventricosus*, it is evident there are several distinct species.

† *U. cariosa*, *Lam.* (Var. 2.) is the *Alas. marginata*, *Say.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

altilis. *Con.*

multiradiatus. *Lea.*

Unio fasciola? *Raf.*

Unio fasciolus. *Con.*

Unio ligamentina. *Desh.*

perovalis. *Con.*

capsæformis. *Lea.*

Greenii. *Con.*

pictus. *Lea.*

tæniatus. *Con.*

interruptus. *Lea.*

venustus. *Lea.*

crassus. *Say. Bar.**

Unio ellipticus. *Bar.*

Unio carinatus. *Bar.*

Unio ligamentina. *Lam.*

Mya gravis. *Wood.*

Unio fasciatus. *Con.†*

* Mr. Barnes made eleven varieties of *crassus*; most of which were no doubt distinct species, some were plicate.

† Mr. Conrad thinks the *crassus* of Say is *fasciata* of Mr. Rafinesque. An

OVAL.

orbiculatus. *Hild.*Unio abruptus.* *Say.*Unio crassus. *Con.*australis. *Lam.*Hydianus. *Lea.*luteolus. *Lam.*Unio siliquoideus.† *Bar. Con.*Unio inflatus. *Bar.*Childreni.‡ *Gray.*pulcher. *Lea.*radiatus. *Lam. Bar. Hild.*Unio Virginiana. *Lam.*Mya radiata. *Gmel. Wood. Dill.*

examination of his description ought to satisfy any one that the *crassus* of Say could not have been under the eye of the author when he made his description of *fasciata*.

* The specimen figure by Mr. Say in Amer. Conch. No. 2, is a female shell. The male shell is not abrupt at the posterior margin.

† Mr. Say makes *siliquoideus* the same with *viridis*, Raf. Ferussac, in his cabinet, makes it the same with *fasciata*, Raf. Mr. Conrad makes it the same with *vittata*, Raf. Ferussac, in his "Observations," states the inextricable difficulty resulting from the confusion caused by Mr. Rafinesque.—See "Observations," p. 13, in Magazin de Zoologie.

‡ I have never seen this species, but presume, from the figure in Griffith's Cuvier, very poor as it evidently is, that it is a distinct species.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

Mya oblongata. *Wood.*

Mya pictorum tenuis. *Chem.*

Medellinus. *Lea.*

notatus. *Lea.*

Vanuxemensis. *Lea.*

Nashvillianus. *Lea.*

Zeiglerianus. *Lea.*

lienosus. *Con.*

obscurus. *Lea.*

delodontus. *Lam.*

Unio lacteolus. *Lea.*

lamellatus. *Lea.*

Bengalensis. *Lea.*

cœruleus. *Lea. Ben.*

olivarius. *Lea. Ben.*

Batavus. *Lam. Pfeif. Flem.*

*Mya pictorum.** *Schröeter. Monta.*

* On the authority of Dillwyn.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

- Mya ovalis*.* *Soland*.
Mya Batava. *Wood. Maton. Dill*.
Mysca Batava. *Turton*.
Unio riparia. *Pfeif*.
Unio pictorum. *Drap.*, pl. 11. fig. 3.
Unio fuscus. *Mühl*.
Unio gibba. *Mühl. Pfeif*.
Unio Labacensis. *Mühl*.
Unio reniformis. *Schmidt*.
Unio fuscus. *Zeig*.
Unio consentaneus. *Zeig*.
Unio amnicus. *Zeig*.
Unio carynthiacus? *Zeig*.
Unio decurvatus. *Rossmuesler*.
Unio sinuatus. *Stud*.
Unio planus. *Stud*.
Unio ater.† *Nil*.

Cumberlandianus. *Lea*.

Smithii.‡ *Gray*.

vibex. *Con*.

Mühlfeldianus. *Lea*.

* On the authority of Dillwyn.

† On the authority of Ferussac.

‡ Never having seen this shell, I place it here on the authority of Mr. Gray.—See his figure in Griffith's Cuvier, Vol. XII.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

creperus. *Lea.*glaber. *Lea.*Hildrethianus.* *Lea.*Al. ambigua? *Say.*fabalis.† *Lea.*Unio capillus. *Say*, Transylvania Journal,
Vol. V.U. lapillus. *Say*, Am. Conch., No. 5. *Con.*parvus. *Bar. Eat.*Unio parvus. *Con.*glans.‡ *Lea.*

* I retain this species among the *Uniones*, although it does not possess a perfect lateral tooth. As it is, however, thickened along the dorsal margin, and puts on the appearance of a tooth, I have concluded that it was better not to remove it to the *S. G. Margaritana*, to which it has little resemblance in its general characters. These observations may apply to *U. oriens* (nobis), and partially to *U. monodonta*, Say, (*U. soleniformis*, nobis.) Mr. Say's description of *ambigua* answers well to *Hildrethianus*, but I am not sure it is the same, as he has given no figure of it. He seems to have abandoned it, as he does not insert it in his "Synonymy." Mr. Conrad also avoids the insertion of it in his Synoptical Table.

† Say and Conrad both in their catalogues give precedence to *lapillus*. *Fabalis* is in my Memoir read before the Am. Philos. Soc., May 7, 1830, and inserted in the Transactions; *capillus* was first inserted in the December number (1831) of the Transylvania Journal, and subsequently in the "Amer. Conch." No. 5, (Aug. 1832) under the name of *lapillus*. Mr. Say does not mention why he changed the name on redescription. I should prefer the first, as a more descriptive name, if I were to choose between the two.

‡ Mr. Say doubts if the *glans* be not the same with *parvus*. I do not see how there can be any difficulty in distinguishing them. The *glans* is a much

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OVAL.

divaricatus. *Lea.*Burroughianus. *Lea.*simus. *Lea.*corrugatus. *Lam.*Mya corrugata. *Müller. Chem. Gmel.*
*Wood. Dill.*Mya rugosa. *Gmel. Wood. Dill.*Mya nodosa? *Gmel. Wood. Dill.*Mya spuria. *Gmel? Wood.*Unio spuria. *Lam.*Unio triradiata. *In "Museum" at Paris.*Niloticus. *Fer.*Mya pictorum. *Forkaël.**Egyptiacus.† *Cailliaud. Fer.*

OBLONG.

brevicens. *Lea.*

heavier shell, and the nacre of all the specimens I have seen is more or less purple, while that of *parvus* is always I believe white. Among many hundred specimens which have come under my notice, I have never seen one of any other colour. The texture of the nacre is also totally different, the latter being more pearly than any other of our *Uniones*. In the epidermis and beaks they also differ essentially.

* On the authority of Ferussac.

† The specimen of this species which I received from M. Cailliaud the traveller is so much like *Niloticus* that I certainly would not myself have separated it.

NON-SYMPHYNOTE UNIONES.	}	SMOOTH.	}	OBLONG.
				tetralasmus. <i>Say.</i>
				camptodon.* <i>Say.</i>
				Unio declivis.† <i>Con.</i>
				obesus.‡ <i>Lea.</i>
				Hopetonensis. <i>Lea.</i>
				Roanokensis. <i>Lea.</i>
				jejunus. <i>Lea.</i>
				complanatus. <i>Lea.</i>
				Mya complanata. <i>Soland. Dill.</i>
				Unio violaceus.§ <i>Spangler.</i>
				Unio purpureus. <i>Say. Bar.</i>

* This fine shell, as well as the preceding one, both of which are Mr. Say's, seem to have been overlooked in the formation of his catalogue. They are described in his *Amer. Conchology*. I have never seen the shell he calls *tetralasmus*,—they may possibly prove to be the same.

† The shell in the Academy of Nat. Sci., described and figured by Mr. Conrad in his "Monography," page 45, as *declivis*, Say, I consider to be a middle aged *camptodon*, Say. This, however, is not the opinion of all our conchologists.

‡ Ferussac believes that this is *Carolinianus* of Bosc. Not having seen the specimen described by Bosc, nor having access to his description, I am unable to decide. The fact, however, of Bosc's having visited Carolina some forty years since, renders it highly probable to be so. Ferussac gives his *trapezium* as a synonym to *Carolinianus*. In my table of the Uniones made in 1829, I considered *Carolinianus* as the *complanatus*: in which I was most likely wrong.

§ On the authority of Ferussac.

|| Mr. Conrad is wrong in his "Synoptical Table," in giving Mr. Say's name precedence, making *complanatus* a synonym.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OBLONG.

- Unio rarisuleata. *Lam.*
 Unio coarctata. *Lam.*
 Unio purpurascens. *Lam.*
 Unio rhombula. *Lam.*
 Unio carinifera. *Lam.*
 Unio Georgina. *Lam.*
 Unio glabrata. *Lam.*
 Unio sulcidens. *Lam.*
 Unio fluviatilis. *Green.*
 Mya rigida? *Wood.*

Griffithianus. *Lea.*

auratus. *Lea.*

Niäa aurata. *Swain.*

atratus. *Lea.*

Niäa atrata. *Swain.*

Niäa fragilis. *Swain.*

confertus. *Lea.*

paliatus. *Ravenel's letter.*

Watercensis. *Lea.*

Unio Raveneli.* *Con.*

* Prof. Ravenel's name being previously used for a *unio* (Amer. Phil. Soc. Trans., Vol. V.), it becomes necessary to change Mr. Conrad's name, which I do, to that of the river in which it was found.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

OBLONG.

fulvus. *Lea.*Unio icterinus. *Con.*Congaræus. *Lea.*declivis. *Say.*Unio geometricus.* *Lea.*Blandingianus. *Lea.*depressus. *Lam.*angustus. *Lam.*modestus. *Fer.*litoralis. *Lam. Pfeif. Des Moul. Grat.*Unio crassus.† *Schr. Retz. Ncil. Speng.*Unio rhomboidea.† *Schr.*Unio brevis. *Lam.*Unio semirugata. *Lam.*Unio nana. *Lam.*Unio subtetragona. *Mich.*Unio incurvus. *Lea.*Unio Pianensis. *Farines.*Unio granosus. *Schum.*Mysea ovata. *Turt.*Mya depressa. *Don.*

* I do not find either of these names in Mr. Say's Synonymy. He has, however, priority.

† On the authority of Ferussac.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

SUBROTUND.

circulus. *Lea. Eat.*

Mya rotunda? *Wood.*

lens.* *Lea.*

rubellus. *Con.*

Masoni. *Con.*

rotundatus. *Lam.*

Unio suborbiculata. Lam. Blain.

Unio glebulus.† Say.

Unio suglobosus. Lea.

Paranensis. Lea.

variabilis. *Lea.*

Mya variabilis.‡ Mat. Wood. Dill.

Unio rotundus. Wag.

personatus. *Say.*

Unio capillaris. Lea.

* I have some doubts whether this should be considered more than a variety of *circulus*. I am not, however, sure that it is not distinct.

† Although Mr. Say had published this shell in the *Transylvania Journal*, and in his *Am. Conchology*, he omitted it altogether in his "Synonymy." Other species are inserted from the vicinity of New Orleans.

‡ The figures of this shell in the *Lin. Soc. Trans.*, Vol. X., although so much smaller a shell than *Paranensis*, (nobis,) is so much like it that I should not be surprised if they should prove to be the same.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

SUBROTUND.

retusus. *Lam. Con.*Unio torsa. *Raf. Eat.*ebenus. *Lea.*Unio mytiloides. *Con., not Raf.*maculatus. *Con.*Kirtlandianus. *Lea.*subrotundus. *Lea.*Unio politus? *Say.*Unio brevialis? *Crouch.*infucatus. *Con.*coccineus. *Lea.*Unio coccineus. *Dr. Hildreth's letter.*Unio coccineus. *Con.*Unio catillus. *Con.*

WIDE.

Shepardianus. *Lea.*folliculatus. *Lea.*rectus. *Lam. Eat.*Unio praelongus. *Barn. Hild.*Unio recta. *Valen.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

WIDE.

Unio Sageri?* *Con.**Mya prælonga.* *Wood.**dehiscens.*† *Say.**Unio oriens.* *Lea.**angustatus.* *Lea.**lanceolatus.*‡ *Lea.**Anodontoides.* *Lea.**Unio teres*? *Raf.**Unio teres.* *Con.**parallelopipedon.* *Lea.**platyrhynchus.*§ *Rossmacsl.**ovalis.* *Flem.**Mytilus angustior.*|| *List.*

* Mr. Conrad's figure so nearly resembles the male specimens of *U. rectus* from Green Bay, in my cabinet, that I am persuaded the *Sageri* will not prove to be a distinct species.

† Mr. Say gives Mr. Rafinesque's name of *lata* precedence. Mr. Eaton says that *An. lata*, Raf., is *Sym. tenuissima*, Lea.

‡ M. Deshayes (2d edit. Lamarck) doubts if *lanceolatus* be not the young of *Anodontoides*. The first has been found only in the waters east of the Alleghany mountains, the last only in the western waters. There cannot be a doubt of their being distinct species. In size they differ altogether.

§ This is a curious and very interesting new species which I recently received from Vienna. Its habitat is Carynthea.

|| On the authority of Fleming.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

WIDE.

Mya ovalis. *Monta.*

Mya ovata. *Don. Mat. Wood. Dill.*

*Mya ovalis.** *Sow.*

Mya depressa. *Don.*

Mysca solida. *Turt.*

Unio nodulosa. *Lam.*

Unio tumida. *Retz. Pfeif. Nil.*

Unio Michaudiana? *Des Moul.*

Unio ovata. *Bouil.*

Unio rostrata. *Stud.*

Unio Limagnæ. *Bouil.*

pictorum. *Lam. Pfeif. Drap. Blain. Crouch.*

Flem. Des Moul. Grat. Bouil.

Mya pictorum. *Lin. Poli. Dill. Wood. Mat.*

Mya corrugata Maroccana.† *Chem.*

Mya augustata. *Schræt. Klein.*

Mysca pictorum. *Turt.*

Unio rostrata. *Lam. Pfeif. Mich. Desh. Bouil.*

Unio manca. *Lam.*

Unio elongatula. *Mühl.*

* On the authority of Ferussac.

† Chemnitz figures this shell table 3, fig. 23 & 24. From the description and outline I have little doubt of its being a young *pictorum*, more than usually undulated in the region of the beaks. Its being rugose over the whole surface, as mentioned by him, is not evidence against its being such. As the first growth subsequently forms the beak of the shell, it ought of course to be rugose, if that be the character of the shell. The inside view is without teeth, but this is doubtless the fault of the draftsman or engraver, as the author speaks of the hinge being like the common mussel.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

WIDE.

- Unio Turtonii. *Payraud.*
 Unio Capigliolo. *Payraud.*
 Unio Requierii. *Mich.*
 Unio Deshayesii. *Mich.*
 Unio limosa. *Nil.*
 Unio longirostris. *Zeigl.*
 Unio Limovianscæ. *Fer.*

elongatus. *Pfeif.*

productus. *Con.*

nasutus. *Say. Barn. Swain.*

Unio rostratus. *Valen.*

Mya nasuta. *Wood.*

Unio subrostratus? *Say.*

Fisherianus. *Lea.*

Jayensis. *Lea.*

lugubris. *Lea.*

marginalis. *Lam.*

Unio anodontina. *Lam.*

iris.* *Lea.*

Unio nebulosus. *Con.*

* Mr. Say in his "Synonymy" gives *iris* as a synonym to his *subrostratus*. If they were the same I would be entitled to precedence, as my description bears date March 1829, while his is January 1831. His description,

NON-SYPHYNOTE UNIONES.

SMOOTH.

WIDE.

tenuissimus. Lea.

Symp. tenuissima. Lea, in Trans. Am. P. S.

An. purpurascens. Swain.

Unio velum. Say.

bilineatus. Lea. Ben.

Symp. bilineata. Lea, in Trans. Am. P. S.

Corrianus. Lea.

phaseolus. Hild. Eat.

Unio planulatus. Lea.

Unio cuneatus. Barn. (White var.)*

arcus. Con.

arctatus. Con.

gibbosus. Bar. Eat. Hild.

Unio mucronatus. Bar.

Unio nasuta. Lam.

Unio dilatata? Raf.

Unio dilatatus. Con.

however, of *subrostratus* does not apply to my *iris*, and certainly this shell could not have been under his eye when his description was made. He says that the *subrostratus* "may be said to be the analogue of the *Unio nasutus* (nobis) of the western waters." As the *U. nasutus* inhabits the western waters a variety of that species may have been described by him for *subrostratus*.

* In note to Dr. Hildreth's Memoir on the shells in the vicinity of Marietta, Ohio, published in Silliman's Journal.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

WIDE.

arctior. *Lea.*

Vaughanianus. *Lea.*

Unio Carolinensis. *Prof. Ravenel's letter.*

OBOVATE.

purpuratus. *Lam.*

Mya ventricosa.* *Solan. Humphreys?*

Unio ater. *Lea.*

Unio lugubris. *Say.*

Unio Poulsoni. *Con.*

rhombeus. *Wag.*

Diplodon rhombeum. *Spir.*

cuprinus. *Lea.*

Unio metallicus.† *Say.*

modioliformis. *Lea.*

Unio delumbis. *Con.*

tenerus. *Rav.*

Unio tenebrosus. *Con.*

Tappanianus. *Lea.*

stramineus. *Con.*

* On the authority of Ferussac.

† Mr. Say in his "Synonymy" claims precedence. My Memoir bears the date of May 7, 1830; his that of January 1, 1831.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

ARCUATE.

crassissimus. *Fer. Des Moul. Grat.*

Mya crassissima.* *Klein.*

Unio auricularis.* *Speng.*

Unio margaritacea. *Drap.*

Unio sinuata. *Lam. Blain. Pfeif. Desh.*

Unio rugosa.* *Poir.?*

monodontus. *Say. Eat.*

Unio soleniformis. *Lea.*

emarginatus. *Lea.*

* On the authority of Ferussac.

Being unacquainted with the following species, I have deemed it best simply to insert a list of them, with the hope of their being determined at a future period :—

Unio rubens. *Menke.*

Unio rugatus. *Menke.*

*Unio Grœnlandicus.** *Schrö. Fer.*

Unio orientalis. *Fer.*

Unio nitidens. *Fer.*

Unio obtusus. *Fer.*

Unio preciosus. *Fer.*

Unio pulchellus. *Fer.*

Unio purpuratus. *Say.*

*Unio musivus.** *Speng.*

*Unio gibbus.** *Speng.*

*Unio truncatus.** *Speng.*

Unio oviformis. *Con.*

Unio furvus. *Con.*

The following species are supposed to exist in a fossil state. As the casts only are usually observed, it must be a matter of great doubt as to the propriety of making species where that is the case :—

Unio crassiusculus. *Sow. Flem.*

Unio concinnus. *Sow. Flem.*

Unio uniformis. *Sow. Flem.*

Unio acutus. *Sow. Flem.*

Unio Listeri. *Sow. Flem.*

* On the authority of Ferussac.

Unio Solandri. *Sow. Flem.*

Unio porrectus. *Sow.*

Unio compressus. *Sow.*

Unio antiquus. *Sow.*

Unio aduncus. *Sow.*

Unio cordiformis. *Sow.*

Unio crassissimus. *Sow. Flem.*

Unio subconstrictus. *Sow. Flem.*

Unio hybridus. *Sow. Flem.*

Unio Urii. *Flem.*

Unio abductus. *Phil.*

Unio peregrinus. *Phil.*

Unio petrosus. *Mor.*

Unio tumulatis. *Mor.*

Unio terrenus. *Mor.*

Unio saxulum. *Mor.*

SUBGENUS MARGARITANA.*

SYMPHYNOTE MARGARITANA.	PLICATE.	TRIANGULAR.
		complanata. <i>Lea.</i> Alas. complanata. <i>Bar. Hild.</i> Symp. complanata. <i>Lea, Trans. Am.</i> P. S.

NON-SYMPHYNOTE MARGARITANÆ.	PLICATE.	QUADRATE.
		confragosa. <i>Lea.</i> Alas. confragosa. <i>Say.</i>
		TRIANGULAR.
		arcula. <i>Lea.</i>
		OBLONG.
		marginata. <i>Lea.</i> Alas. marginata. <i>Say. Bar.</i>

* The genus *Margaritana* was proposed by Schumacher in his "Essai d'un Nouveau Système des Habitations des Vers Testacés" published in 1817, for the *Mya margaritifera*, Lin. (*Unio elongata*, Lam. and *Alasmodonta arcuata*, Bar.) Mr. Say in 1818 proposed to establish this same division under the generic name of *Alasmodonta*. The Danish zoologist having priority of date must have his name preferred.

NON-SYMPHYNOTE MARGARITANÆ.

PLICATE.

OBLONG.

- Alas. truncata*.^{*} *Say.*
Unio cariosa. (Var. 2.) *Lam.*
Unio varicosa. *Lam.*
Unio calceolus. *Say*, not of *Lea.*
Mya regulosa. *Wood.*

- rugosa*. *Lea.*
Alas. rugosa. *Bar. Eat. Hild.*
Alas. abducta.[†] *Say.*

SMOOTH.

TRIANGULAR.

- deltoides*. *Lea.*

undulata. *Lea.*
Alas. undulata. *Say. Bar.*
Alas. sculptilis, (young.) *Say.*
Mya undulata. *Wood.*
Unio hians. *Valen.*
Unio glabratus.[†] *Sow.*

OVAL.

- Raveneliana*. *Lea.*

radiata.[‡] *Lea.*

* Several specimens of fine *marginata* have been sent to me from the west, marked *Alas. truncata*, Say, being one of his unpublished names, but given by him to various conchologists under that name. I have never considered it distinct from the *marginata* of the eastern rivers, although it is generally larger and of finer colour in the exterior.

† On the authority of Ferussac.

‡ This shell, in the teeth, except in the size of them, very closely resembles the *An. areolatus*, Swain, which Mr. Say described as *Alas. edentula*.

NON-SYMPHYNOTE MARGARITANÆ.

SMOOTH.

OVAL.

Alas. radiata. *Con.*

*calcecola.** *Lea.*

Unio calceolus. *Lea*, Trans. Am. P. S.

Alas. marginata.† *Say.*

Alas. truncata. *Con.*, not of *Say.*

OBOVATE.

Bonellii. *Lea.*

Alas. Bonellii. *Fer.*

Unio depressa. *Pfeif. Mühl.*

Unio compressa. *Menke.*

ARCUATE.

margaritifera. *Lea.*

Mya margaritifera. *Lin. Knorr. Dill. Desh.*
Wood. Mat. Monta. Mühl. Retz.
Nil.

Margaritana fluviatilis. *Schum.*

Although in both these shells there is a small cardinal tooth, in all their other characters they so closely resemble the *Anodontæ*, that it is a matter of doubt with me as to the propriety of separating them. An examination of the animals when satisfactorily dissected may show the propriety of placing them both, notwithstanding their possessing small teeth, with the *Anodontæ*.

* In my Memoir in the Trans. Am. Phil. Soc., Vol. III. page 420, (page 34 of "Observations on the Genus *Unio*,") I mention this shell as being closely allied to the genus *Alasmodonta* of Say. In this Synopsis I have deemed it better to transfer it to the subgenus *Margaritana*, as the lateral tooth is observable in very few individuals. Deshayes says it is between *Unio* and *Alasmodonta*.

† Mr. Say in his "Synonymy" makes *calceolus* and *Alas. marginata* the same. I am surprised at this, as their characters in many respects are very different, and I have never heard it even suggested before that they could be confounded.

NON-SYMPHYNOTE MARGARITANÆ.

SMOOTH.

ARCUATE.

Unio elongata. *Lam. Mich. Bouil.*Unio sinuata. *Pfeif.*Unio Roissyi. *Mich.*Unio margaritiferus. *Pfeif. Drap. Turt.*Unio rivalis. *Zeig.*Alas. margaritiferum. *Flem.*Alas. arcuata. *Bar.*Holstonia. *Lea.*fabula. *Lea.*

The following species are unknown to me :—

Alasmodonta Tripolitina. *Fer.*Alasmodonta incurva. *Fer.*

SUBGENUS DIPSAS.

SYMPHYNOTE DIPSASES.	PLICATE.	TRIANGULAR.
		plicatus.* <i>Leach.</i>
		Myt. plicatus. <i>Soland.</i>
		Myt. dubius. <i>Gmel. Dill.</i>
		Cristaria tuberculata? <i>Schum.</i>
		An. dipsas. <i>Fer.</i>
		An. tuberculatus. <i>Fer.</i>
	SMOOTH.	Symp. bi-alata. <i>Lea, Trans. Am. P. S.</i>
		Unio bi-alata. <i>Desh.</i>
		discoideus.† <i>Lea.</i>
		Symp. discoidea. <i>Lea, Trans. Am. P. S.</i>
		Unio tenuis. <i>Gray.‡</i>
		An. tenuis. <i>Gray.‡</i>

* Perfect specimens show the whole linear tooth, and the folds on the posterior slope and on the posterior wing, but old and imperfect specimens sometimes exhibit neither. The imperfect figure and description by Leach of this fine shell led me to believe that it could not be the same with that which I described under the name of *Sym. bi-alata*.

† The posterior termination of the tooth shows some disposition to duplication, and evidently bears a disposition to pass into the subgenus *Unio*.

‡ In Griffith's Cuvier.

SUBGENUS ANODONTA.

SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.	magnifica. <i>Lea.</i>
			Symp. magnifica. <i>Lea</i> , Trans. Am. P. S.
			Woodiana. <i>Lea.</i>
			Symp. Woodiana. <i>Lea</i> , Trans. Am. P. S.
			Benedictensis. <i>Lea.</i>
			Symp. Benedictensis. <i>Lea</i> , Trans. Am. P. S.
NON-SYMPHYNOTE ANODONTÆ.	PAUCATE.	OBOVATE.	crispata. <i>Lam.</i>
	SMOOTH.	OVAL.	cygnea.* <i>Drap. Lam. Crouch. Blain.</i>
			<i>Pfeif. Turt. Des Moul. Flem.</i> <i>Grat. Bouil.</i>

* I have, after a good deal of consideration and examination of my specimens and the figures in the numerous works describing the *Naiades*, satisfied myself that *An. cygnea* and *An. anatina* are not specifically distinct. If the observation of M. Poiret, that the first is viriparous and the last oviparous, be correct, then they should be certainly separated. I feel perfectly persuaded, however, that he must be in error. Turton, in his recent work on the Land and Fresh Water Shells of Great Britain, says he is "inclined to think that all our supposed species of this genus may be justly resolved into one."

OVAL.

Myt. cygneus. *Gmel. Dill. Mühl. Monta. Mat.* Shep. Tur.*

Myt. anatinus. *Gmel. Schum. Wood. Monta. Tur. Dill. Mat.*

Myt. stagnalis. *Gmel. Bosc. Schrö. Dill. Sow.*

Myt. fluviatilis.† *Gmel.*

Myt. fucatus. *Dill.*

Myt. Zellensis. *Gmel. Schrö. Bosc.*

Myt. Avonensis. *Monta. Wood. Ed. Enc.*

Myt. radiatus.‡ *Mühl. Schrö.*

Myt. incrassatus. *Shep.*

Myt. macula. *Shep.*

An. anatina. *Lam. Dill. Drap. Sow. Pfeif. Flem. Grat. Des Moul. Bouil.*

An. sulcata. *Lam.*

An. dentiens. *Menke.*

An. intermedia. *Lam. Pfeif. Bouil.*

An. variabilis. (Var. b.) *Drap.*

An. cellensis. *Pfeif.*

An. ventricosa. *Pfeif.*

An. ponderosa.§ *Pfeif.*

* ♂ of Maton and Racket (Lin. Soc. Trans., Vol. IV.) is evidently, judging from the figure, *Unio litoralis*.

† Gmelin states this shell to be from the fresh waters of Europe, and allied to *Anatina*. If this be true there cannot be a doubt of its being the same with *cygnea*. The *fluviatilis* of Solander and Dillwyn is said to be from North America, and is no doubt the *cataracta* of Say.

‡ On the authority of Dillwyn.

§ This and the *grossa* are certainly very different in aspect from the *cygnea*, Lam., being more ponderous and less produced behind. This difference may, however, be effected by locality. Should it prove constant, *ponderosa*

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

- An. paludosus.* *Tur.*
An. grossa. *Zeig.*
*An. compressa?** *Zeig.*
*An. obvoluta?** *Zeig.*
An. spuria. *Count Yoldi's letter.*
An. proboscidalis. *Zeig.*
An. piscinalis. *Nil.*
Anodontites cygnea.† *Poir.*
Anodontites anatina. *Poir.*

fragilis. *Lam.*

uniopsis. *Lam.*

undulata. *Say.*

Anodon rugosus. *Swain.*

Anodonta Pennsylvanica. *Lam.*

Wardiana. *Lea.*

A. virgata. *Con.*

edentula. *Lea.*

Alas. edentula. *Say.*

Anodon areolatus. *Swain. Coop.*

ought to be considered a distinct species, and I am much disposed to think that such will prove to be the fact.

* On the authority of Ferussac.

† On the authority of Des Moulins.

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

trigona.* *Spix.*

radiata.† *Spix.*

purpurea. *Valen.*

Ferussaciana. *Lea.*

salmonia. *Lea.*

incerta. *Lea.*

fluviatilis. *Lea.*

Myt. fluviatilis.‡ *Soland. Dill. Wood.*

Myt. illitus. Soland.

An. cataracta. Say.

An. implicata? Say.

An. teres. Con.

glauc.§ *Valen.*

An. glauca. Lam.

* Ferussac considered *trigona* as the same with *crassa* of Swainson. The two figures, however, appear to me to be too different to be considered the same.

† The outline of this species is very much like that of *trigona*, *Spix*, and they may, perhaps, prove to be the same species. Ferussac considered it to be the young of *exotica*, *Lam.*, in which I cannot agree with him.

‡ See note on *An. cygnea*, page 49.

§ The figure of this shell resembles some individuals of *Myt. fluviatilis*, *Soland.* (*Say's An. cataracta.*) but is straighter on the superior margin. In this character it resembles the *trapezialis*. The observations of Barnes, being made when little was known of this genus, cannot now be admitted.

NON-SYMPHYNOTE ANODONTÆ.

SMOOTH.

OVAL.

ovata. *Lea.*

plana. *Lea.*

An. declivis. *Con.*

decora. *Lea.*

gigantea. *Lea.*

subvexa. *Con.*

Stewartiana. *Lea.*

globosa. *Say.*

An. inflata. *Major Le Conte's cabinet.*

grandis. *Say. Lesueur.*

An. corpulenta. *Coop.*

SUBROTUND.

suborbiculata. *Say.*

membranacea. *Lea.*

Myt. membranaceus. *Mat.*

OBOVATE.

obtusa. *Spix.*

An. lituratum. *Spix.*

Patagonica. *Lam.*

OBOVATE.

lato-marginata.* *Lea.*An. trapezius?† *Spix.*An. rotundus? *Spix.*porcifer.‡ *Gray.*trapezialis. *Lam. Blain. Crouch.*An. exotica.§ *Lam.*An. giganteus. *Spix.*An. pencillatus? *Gray.*An. Susannæ. *Gray.*An. anserinus. *Spix.*Georginæ. *Gray.*Parishii.|| *Gray.*Blainvilliana. *Lea.*crassa. *Swain.*

WIDE.

elongata. *Swain.*

* The *Patagonica* and *lato-marginata*, when they are better observed, may prove to be the same.

† Spix's figure so closely resembles the *lato-marginata*, that I scarcely feel a doubt as to their being the same. He does not, however, notice the broad margin which is so characteristic of this species.

‡ Never having seen this species I place it here on Mr. Gray's authority.

§ So far as I have been enabled to examine specimens of this and *trapezialis*, I am disposed to think they are not distinct species.

|| On the authority of Mr. Gray.

NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	WIDE.	
			cylindræa. <i>Lea.</i>
			Buchanensis. <i>Lea.</i>
		ARCUATE.	
			tenebricosa. <i>Lea.</i>
			arcuata. <i>Fer.</i>
			sinuosa. <i>Lam.</i>

The following species are unknown to me:—

- Anodonta folium. *Fer.*
 Anodonta Chinensis. *Fer.*
 Anodonta curvatus. *Fer.*
 Anodonta imbecilis. *Say.*
 Anodonta lugubris. *Say.*
 Anodonta impura. *Say.*
-

FOSSIL SPECIES.

- Anodonta? Abyssina. *Mort.*

SUBGENUS PLEIODON.

NON-SYMPHYNOTE
PLEIODON.

SMOOTH.

OBOVATE.

Macmurtriei. *Con.*

GENUS IRIDINA.

NON-SYMPHYNOTE IRIDINÆ.

SMOOTH.

OVAL.

rubens. *Desh.*

An. rubens. *Lam. Blain.*

An Clappertoni. *Den.*

WIDE.

Nilotica. *Sow. Fer. Crouch. Caill.*

An. dubia. *Bosc.*

Irid. Oudnicei. *Den.*

Myt. Niloticus. *Wood.*

exotica. *Lam. Sow? Caill.*

Barbata plicatus.* *Humph.*

Irid. elongata. *Sow.*

Irid. striata. *Swain.*

An. exotica. *Blain.*

siliquosa. *Lea.*

An. siliquosus. *Spix.*

An. pygmæum, (young.) *Spix.*

* On the authority of Ferussac.

NON-SYMPHYNOTE IRIDINÆ.	SMOOTH.	WIDE.	
			cœlestis. <i>Lea.</i>
			ensiformis.* <i>Lea.</i>
			An. ensiformis. <i>Spix.</i>
			longina. <i>Fer.</i>
			An. longinus. <i>Spix.</i>

* It is with a good deal of doubt that I have placed this shell among the *Iridinæ*, as I know not whether the animal is furnished with tubes.

In Professor Rafinesque's Monograph, and in his subsequent Papers, are inserted descriptions under the following names. Not being able to identify them, I have deemed it better simply to give a catalogue of them. Those which I suppose I have identified will be found in the foregoing table.

<i>Alasmodonta atropurpureum?</i>	<i>Unio aurata?</i>
<i>badium?</i>	<i>bicolor?</i>
<i>costata?</i>	<i>bullata?</i>
<i>hians?</i>	<i>biloba?</i>
<i>ponderosum?</i>	<i>cardium?</i>
<i>papyraceum?</i>	<i>Cliffordiana?</i>
<i>rugosum?</i>	<i>calendis?</i>
<i>sulcatum?</i>	<i>chloris?</i>
<i>scriptum?</i>	<i>castaneus?</i>
<i>viridis?</i>	<i>crassa?</i>
	<i>cinerescens?</i>
<i>Anodonta atra?</i>	<i>cuneata?</i>
<i>aperta?</i>	<i>cyclips?</i>
<i>cuneata?</i>	<i>cuprea?</i>
<i>digonota?</i>	<i>cyphia?</i>
<i>inflata?</i>	<i>decorticata?</i>
<i>lata?</i>	<i>diploderma?</i>
<i>Ohiensis?</i>	<i>diaphanus?</i>
<i>solenoides?</i>	<i>ellipsaria?</i>
	<i>elliptica?</i>
<i>Unio antrosa?</i>	<i>fasciata?</i>
<i>atroviolacea?</i>	<i>fulvus?</i>
<i>argyratus?</i>	<i>fontinalis?</i>
<i>attenuata?</i>	<i>fulgens?</i>

*Unio fasciolaris?**flava?**flexus?**fragilis?**granulatus?**interrupta?**lateralis?**latissima?**leptodon?**lævigata?**lamobrachys?**lineolata?**lividus?**megaptera?**montanus?**melaplata?**nervosa?**nodulata?**obliquata?**obovalis?**olivaria?**ovata?**paphos?**pachostea?**ponderosus?**pallida?**plateolus?**pusella?**pallens?**perplexus?**Unio quadrula?**retusa?**rimosus?**rosea?**rivularis?**stegaria?**sintoxia?**sinuata?**solenoides?**striata?**subrotunda?**torulosa?**teneltus?**triangularis?**triqueter?**truncata?**verrucosa?**viridis?**vittatus?**Venus?**zonalis?**Odatelia radiata?**Lasmonos fragilis?**Diplasma marginatæ?**similis?**vitrea?**striata?*

ADDENDA.

Since the preceding sheets have gone through the press I have described or seen the following new species:—

	Page
Unio Dorfuillianus, <i>Lea</i> , should follow U. asper - - -	15
graniferus, <i>Lea</i> , should follow U. verrucosus - - -	16
Rangianus, <i>Lea</i> , should follow U. Ravenelianus - -	22
Menkianus, <i>Lea</i> , should follow U. interruptus - -	24
discus, <i>Lea</i> , should follow U. Burroughianus - - -	29
Cailliaudii, <i>Fer.</i> , should follow U. platyrhynchus	35
contradens, <i>Lea</i> , should follow U. Tappanianus - -	39
An. Nuttalliana, <i>Lea</i> , should follow An. Benedictensis	48
Wahlamatensis, <i>Lea</i> , should be first in the subgenus	48
Oregonensis, <i>Lea</i> , should follow An. cygnea - - -	50
pavonia, <i>Lea</i> , should follow An. edentula - - -	50
chiziana, <i>Rang.</i> , should follow An. uniopsis - - -	50
Newtonensis, <i>Lea</i> , should follow An. incerta - - -	51
exilis, <i>Lea</i> , should follow An. Buchanensis - - -	54

Tetraplodon pectinatum, *Spix.*, is *Unio ambiguus*. (nobis.)
(*Castalia ambigua*, Lam.)

Diplodon ellipticum, *Spix.* *Unio multistriatus?* *Lea.*

To the synonyms of *An. fluviatilis*, page 51, add *An. marginata*, Say.

ERRATA.

Page 10, *for* Triptodon, *read* Triplodon.

“ 11, *for* Diptodon fuscatum, *read* Diplodon furcatum.

“ 14, *for* fragrosus, *read* fragosus.

“ 14, *for* Merchisonianus, *read* Murchisonianus.

“ 36, *for* augustata, *read* angustata.

“ 40, emarginatus should be in the line of species not synonyms.

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