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A

SYNOPSIS

OF THE

FAMILY UNIONIDÆ.

BY

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LATE PRESIDENT OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA;  
MEMBER OF THE ZOOLOGICAL SOCIETY OF LONDON, ETC. ETC.

FOURTH EDITION, VERY GREATLY ENLARGED AND IMPROVED.

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TO

ISAAC HAYS, M. D.,

LATE PRESIDENT OF THE ACADEMY OF NATURAL SCIENCES, ETC.

MY VERY DEAR FRIEND:—

I have already dedicated one of my volumes of Observations on the Genus *Unio* to you; still, as this is the most important of all my works, I cannot resist the inclination to offer it to you, who have been my lifelong companion, associate, and friend. For over fifty years we have been united in labors to promote the cause of Science, by the ties of friendship and the congeniality of tastes and pursuits. In my particular branch you have always aided me by your sympathy and advice. All medical men know what eminent services you have rendered in the advancement of the healing art. These are claims which induce me to ask you to accept this, the fourth edition of my Synopsis, which is almost a new work.

Always your constant and sincere friend,

ISAAC LEA.



## PREFACE TO FOURTH EDITION.

It is now eighteen years since the last edition of this "Synopsis" was published. The advancement of the knowledge of Natural History has been accelerated during that period by the labors of many men of science, the younger of whom have embraced the study with great earnestness and energy. The effect of this progress has been felt very sensibly in that interesting group of *Mollusca* which embraces the Family *Unionidae*. Consequently the additions of species and synonyms have been largely increased, resulting, in fact, in more than doubling the lists of the last edition. The labor required for this portion of the work has been very great.

The same principles of arrangement of the tabular system which were used in the previous editions have been retained in this. After the experience of thirty-four years since the first edition was issued, I have had no reason to believe that any better arrangement could be devised in the present state of our knowledge. The tables have therefore been extended to the present time, and have been so much enlarged with new matter as almost to entitle the work to be considered a new one. This has been done with a faithful desire to recognize every fellow-laborer in this group, and to render to each one full justice. Some may have been omitted, for want of access to their works—none intentionally.

The present edition is greatly improved and enlarged by additions to the geographical distribution tables, and by the habitat of each of the species; and the *Index* referring to the tables of species and synonymy has had the exact references fully made to the works where they were originally announced. These two very important additions to the previous editions will facilitate the use of reference to all the works on the subject which this "Synopsis" embraces.

These tables were originally made for my own use. Subsequently I was induced to print them, and they have now expanded to a large volume. With all the care which has been bestowed on them, I do not present them as a perfect and complete work, and I trust that any omissions and errors may be pointed out to me.

The Bibliographical List of the *Unionidæ* at the end of the volume will surprise the general student by its enormous extent, comprising, as it does, about eleven hundred references, and yet I am perfectly aware that many works will be found to exist which have never come under my notice.

PHILADELPHIA, June, 1870.

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## CORRIGENDA ET ADDENDA.

PAGE	LINE		PAGE	LINE	
25	20	add <i>Triquetra obliqua</i> . Adams.	62	17	for Laonensis read Laosensis.
27	14	and in note, for <i>Crossiana</i> read <i>Crosseiana</i> .	63	18	for Dumboæ read Dumbeæ.
27	11	insert below <i>Duprei</i> , <i>Castalia Duprei</i> . Recluz as a synonym.	64	12	strike out <i>U. Pugio</i> . Ben. Reeve.
28	14	under <i>delphinus</i> insert as syn. <i>Hyria delphinus</i> , Trosch.	64	13	for Terheri read Zeyheri.
29	17	for <i>Vondembushiana</i> read <i>Vondembuschiana</i> .	64	22	strike out <i>Schwerzenbachii</i> . Bourg.
30	2	for <i>Nyassensis</i> read <i>Nyassaensis</i> .	65	5	for aqualina read aqualinus.
31	12	for <i>cripsiculatus</i> read <i>cripisculatus</i> .	65	12	for <i>Bronn</i> . read <i>Goldfuss</i> .
32		in 2d column, insert NODULOUS.	65	15	for <i>Bronn</i> . read <i>Sowerby</i> .
35	21	for <i>Grundlachi</i> read <i>Gundlachi</i> .	66	19	for <i>tumulatis</i> read <i>tumulatus</i> .
36	3	for <i>Demararaensis</i> read <i>Demeraraensis</i> .	66	27	transfer <i>Unio Veræ-Pacis</i> to page 64.
38	2	for <i>habetetus</i> read <i>hebetatus</i> .	71	4	under <i>isocardioides</i> Lea, place <i>Unio isocardioides</i> Reeve.
38	6	after <i>favidens</i> insert as a synonym <i>U. triros-tris</i> . Reeve.	72	11	for <i>Monge</i> read ( <i>Monoc.</i> )
39	21	for <i>cardiacea</i> read <i>cardiacea</i> .	72	6	for <i>Salmeniana</i> read <i>Salweniana</i> .
40		last line in first column, add <i>Sumatrensis</i> . Dunk.	72	3	for <i>Mechonii</i> read <i>Michonii</i> .
42	18	for <i>turdigulus</i> read <i>turgidulus</i> .	75	16	for <i>Math.</i> read <i>Meth.</i>
42	21	place <i>Con.</i> before <i>Han.</i>	76	2	after <i>cygnea</i> insert <i>Lin.</i>
43	19	for <i>Lea</i> read <i>Con.</i>	78	22	under <i>An. McNiellii</i> place <i>An. opalina</i> Anth.
44	4	after <i>tenerus</i> add <i>tenebrosus</i> , <i>Con.</i> as a synonym.	81	21	for <i>Napotalensis</i> read <i>Nopalatensis</i> .
44	3	add <i>delumbis</i> , <i>Con.</i> as a synonym to <i>modioliformis</i> , <i>Lea</i> .	84	17	for <i>Leotandi</i> read <i>Leotaudi</i> .
46	9	for <i>Blan.</i> read <i>Lea</i> .	84	15	for <i>opilina Kust</i> read <i>opalina</i> .
48	23	insert <i>Bourg.</i> before <i>Parr.</i>	84	32 & 33	for <i>Küst.</i> read <i>Kutschig</i> .
48	24	insert <i>rasus</i> , <i>Lea.</i> after <i>Mosulensis</i> , <i>Lea</i> .	118	42	after <i>Vid.</i> insert <i>Fauna Dalmatiens</i> by Frauenfeld in <i>Zool. bot. Vereins</i> 1856.
49	32	for <i>Vandembuschiana</i> read <i>Vondembuschiana</i> .	121	43	for <i>Drap</i> read <i>Dup.</i> and for 41 read 65.
53	24	for <i>legubris</i> read <i>lugubris</i> .	150	5	for <i>Chirriet</i> read <i>Cirrhipes</i> .
			105 & 106		<i>A. atrovirens</i> and <i>cornea</i> , Nicaragua. Inadvertently put in <i>So. Am.</i> list instead of <i>No. Am.</i>

# SYNOPSIS

OF

## THE FAMILY OF UNIONIDÆ.

SOME students of the Mollusca have treated the Family *Unionidæ* as of little importance or interest. This has evidently arisen from the fact that they are common and generally not attractive to the eye as the marine species are. But when we consider that over 1000 books and papers are inserted in the list herein presented, we must acknowledge that most of the best writers on Malacology have given space and attention to the importance of the subject. Deshayes very properly remarks: "Aussi il est peu de genres dans le grand ensemble des Mollusques qui ait été plus fréquemment mentionné que celui-ci."<sup>1</sup>

And Swainson in his *Malacology* very properly remarks that "The *Unionidæ*, of all the groups of DITHYRIA (*Conchifera*), is that which contains the greatest modifications of form; insomuch that it becomes almost impossible, in some of its minor divisions, to determine which are species and which varieties," &c.—P. 290.

The following table of arrangement and synonymy was undertaken purely with the view, and in the hope of clearing away the difficulties which had encumbered one of the most interesting families of the Mollusca. In this attempt I met, while pursuing the task, with obstructions and difficulties which I 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. The extensive and admirable library of the Academy of Natural Sciences of Philadelphia has greatly aided me in this and the previous editions. In attempting to establish the synonymy, I have endeavored to render the strictest justice, and if, in any case, it be found that I have failed to do this, it will be a matter of sincere regret. All corrections will be gratefully acknowledged.

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<sup>1</sup> *Traité Élémentaire*, T. xi. p. 195.

In the following tables there will be found in the Family, 1069 recent species as admitted, 224 unknown to me or doubtful, and 183 fossil; in all 1476; and the synonymy according to my views is enormous, being 891.

Of the subgenus *Triquetra* (*Klein*),<sup>1</sup> there are 4 species and 25 synonyms.

Of the subgenus *Prisodon* (*Schumacher*),<sup>2</sup> 3 species and 13 synonyms.

Of the subgenus *Unio* (*Retzius*), there are 833 species in a recent state and 501 synonyms. In addition there are 141 which I have not been able to admit as certain; of fossil species 169.

Of the subgenus *Margaritana* (*Schumacher*), there are 29 admitted species, and 6 which are unknown to me. There are 66 synonyms.

Of the subgenus *Plagiodon* (*Lea*), there is 1 species.

Of the subgenus *Monocondylæa* (*D'Orbigny*), there are 26 species, and 4 unknown to me. There are 27 synonyms.

Of the subgenus *Dipsas* (*Leach*), I know of but 2 species, both of which are recent. There are 20 synonyms.

Of the subgenus *Anodonta* (*Cuvier*), there are 148 admitted species, and 68 which are unknown to me. Of fossil species there are 14. Of synonyms there are 189.<sup>3</sup>

Of the subgenus *Columba* (*Lea*), there are 2 species, and 13 synonyms.

Of the subgenus *Byssanodonta* (*D'Orbigny*), 1 species.

Of the subgenus *Iridina* (*Lamarck*), there are 4 species, and 3 unknown to me.<sup>4</sup> There are 6 synonyms.

Of the subgenus *Spatha* (*Lea*), there are 9 species, all recent, and 2 unknown to me. There are 22 synonyms.

Of the subgenus *Myctopus* (*D'Orbigny*), there are 8 species, and 8 synonyms.

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Most of the distinguished authors who have written on the subject of the division of this Family, have acknowledged the extreme difficulty they have encountered in separating it into natural groups. This difficulty is not peculiar to the *Unionidae*. In most of the Families where a great number of species has been observed, we find

<sup>1</sup> *Tentamen Methodi*, 1753.

<sup>2</sup> *Nouveau Système*, 1817.

<sup>3</sup> To *Anodonta cygnea* alone I make 106 synonyms, and I believe that many in my doubtful list will be found to be mere synonyms to this prolific species, which has been a mine to ambitious species makers.

<sup>4</sup> Mr. Gray, in his *List of Genera*, *Pro. Zool. Soc.*, 1847, gives priority to Scopoli, *Intro. ad Hist. Nat.*, 1777, under the name of *Mutela*. Scopoli adopts Adanson's name of *Mutel*, and adds the *a* to it.



these 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.*” A writer in the *Edinburgh Review*, No. 212, p. 494, says some German and French botanists “content themselves with calling *species* any collection of individuals which resemble each other more than they do any other set of individuals, without any limitation to the degree of resemblance or difference which shall determine whether they belong to the same or distinct species.”

“But the more rational definition adopted in substance by all the great masters of the science of the present day is that of ‘a collection of individuals which, by their resemblance to each other, or by other circumstances, we are induced to believe are all descended or *may have* descended from one individual or pair of individuals.’ The various modifications of this definition enumerated by De Candolle consist chiefly in the more or less detailed enumeration of the other circumstances, such as hereditary constancy of character, facility of intermixture of breeds,” &c.

In the vegetable kingdom, the same obstructions to a system are encountered. The observations of Lindley<sup>1</sup> 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 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.”

Linnaeus defines species thus: “Species tot sunt quot diversas formas ab initio produxit Infinitum Ens; quæ formæ secundum generationis inditas leges, produxere plures, at sibi semper similes.”—*Phil. Bot.*, 99, 157.

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<sup>1</sup> See *Introd. to Botany*, p. 307.

According to St. Hilaire a species is a collection or succession of individuals characterized by a combination of distinctive features, the transmission of which is *natural, regular, and indefinite* in the existing order of things."

MM. Ray and Dronet (*Revue et Mag. de Zoologie*, 1849) give their views of what forms a species in the following terms: "Généralement on entend, par se mot (espèce), un type d'organisation de forme et d'activité, rigoureusement déterminé, qui se perpétue successivement par génération directe et d'une manière indéfinie avec la même constance de caractères."<sup>1</sup>

Milne Edwards's definition of species, I think, is less clear. He says: "On donne le nom d'espèce à la réunion des individus, qui se reproduisent entre eux avec les mêmes propriétés essentielles."

Cuvier considered that the fact of the succession and of the constant succession, constituted alone the validity of the species.

Dr. Morton comprised his view of species as "a primordial organic form."

Neither of these definitions fulfils my own idea of what forms a species. It seems to me that a species must be considered to be a *primary established law*, stamped with a persistent form (a type), pertaining solely to itself, with the power of successively reproducing the *same form* and none other.

Blainville, in his *Manuel de Malacologie*, divides the *Unionidae* (his *Sub-Mytilacea*) into *Anodonta* and *Unio*, but thinks that species will be found which will make these to be united.<sup>2</sup>

Dana<sup>3</sup> says "a species corresponds to a *specific amount or condition of concentrated force, defined in the act or law of creation.*"

Sowerby says: "The difficulty of ascertaining to which genus of Lamarekian *Naiades* 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 surprising 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."<sup>4</sup> And further: "We think we have already said enough to prove that, unless it be thought

<sup>1</sup> M. Dronet, in his *Études sur les Naiades de la France*, 1854, has given valuable observations on the anatomy, function, diagnosis, &c. of *Anodonta*.

<sup>2</sup> See page 540.

<sup>3</sup> Thoughts on Species. *Am. Jl. of Science*, 1857.

<sup>4</sup> *Zool. Journ.*, vol. i.

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."

Deshayes, in his edition of Lamarck's *Animaux sans Vertèbres*, says it is impossible to separate the genera of the *Unionidæ*. "Nous pourrions prendre pour exemple celui des genres qui est considéré comme l'un des mieux caractérisés. Le genre *Symphynote* (*Lea*) est fondé sur ce caractère remarquable que les deux valves sont soudées entre elles le long du bord supérieur," etc. "Nous concluons que tout ce grand ensemble ne peut et ne doit former qu'un seul genre constituant à lui seul la famille des *Nayades*."<sup>1</sup>

In his admirable work *Traité Élémentaire de Conchyliologie*, not yet finished, he continues to consider that his twenty-fifth Family, *Nayades*, is filled by one genus, viz., *Unio* of Retzius. He makes, however, four divisions, which, he says,<sup>2</sup> "diffère à peine de celle de M. Lea."

Genre	Unio, Retzius	{	<i>Unio</i> . . . . .	{	<i>Unio</i>	{	A. Symphynotes.
			<i>Hyria</i>	{	B. Non-symphynotes.		
		{	<i>Margaritana</i> . . . . .	{	A. Espèces symphynotes.		
			<i>Dipsas</i> . . . . .	{	B. Espèces non-symphynotes.		
			Symphynotes.				
		{	<i>Anodonta</i>	{	<i>Mycetopus</i>	{	A. Espèces symphynotes.
	<i>Anodonta</i>				B. Espèces non-symphynotes.		
	<i>Iridina</i>						

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."<sup>3</sup> In my attempts to verify this, I have

<sup>1</sup> Vol. vi. p. 526.—I shall be excused in taking this opportunity to correct an erroneous impression on the mind of M. Deshayes. He says that I was not able to examine the collection of the Museum of Paris. "Malgré cette imperfection qu'il ne pouvait empêcher, le travail de M. Lea se recommande à 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 collections from which Lamarck 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 *Unionidæ* that were in the Museum, and named them; and also presented to the Museum about fifteen species which were new to that great national institution. I also did the same thing for Baron Ferussac, having designated every specimen in his cabinet belonging to this family.

<sup>2</sup> *Traité Élém.*, vol. ii. p. 213.

<sup>3</sup> Swainson, in Lard. *Cycl. Nat. Hist.*, p. 247. In his *Treatise on Malacology* the same author keeps this idea in constant view, and thus invalidates his groups. Besides, he was little acquainted with foreign species.

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 admit. The arrangement of the system adopted in this Synopsis, whatever may be said to the contrary, is eminently natural as regards the exo-skeleton or shelly covering of the included soft parts. Although I have examined critically and published descriptions of the soft parts of 254 species of this family, and often dissected 50 to 100 of the same species, I cannot see, as yet, any useful division that could satisfy the student or the adept, which can be made by systematic difference in the organic forms of the soft parts. With a knowledge of the soft parts of about only a fourth part of the family, is it not unwise to attempt a division for the whole? And again, will it not be a very long time before it will be possible to obtain the complete animal of most of the species? Some of them perhaps never will be obtained by the American or European Malacologist. I am satisfied that eventually, when we shall become sufficiently acquainted with the soft parts of most of the *Unionidæ*, the best division into genera will be founded on the diverse forms of the *branchial uteri*. I have now examined carefully 254 species, mostly with charged uteri, and I have come to the conclusion that any safe division, founded on the characters of the functional soft parts, must be based on this very important organ, which shows so distinct and varied a conformation, often involving, as it does, the form of the massive envelope.

In regard to the making of species a few remarks may be made here. That there has been great abuse of it there can be no doubt. Think of the nearly 250 synonyms for the seven or eight species of the Family *Unionidæ* living in Europe! Many very able writers have deprecated this folly and ignorance, but it still goes on. In the United States we have such an extraordinary development of this form of shell life, that many European writers find it difficult to give us credit for our real disposition—at least I speak for myself—of keeping down our species as much as possible. The nomenclature is becoming truly embarrassing, and there seems to be no avoidance of it. We have by no means exhausted the discoveries of these forms in Georgia, Alabama, and Mississippi, which States seem to be, and particularly Georgia, the centre of this form of Malacological life.<sup>1</sup> No species has ever been described by me without the greatest care and all examination used that was possible. When not well satisfied of distinctive characters, I have laid the specimen aside in hopes of better light, and I have by me now many of which I am uncertain as

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<sup>1</sup> The late Bishop Elliott, who did so much to develop the *Unionidæ* of Georgia, observed to me in one of his letters, that almost every stream seemed to afford him new species.

to their identity, and therefore I hesitate. Some of these I have had for more than twenty years.<sup>1</sup> It should be remembered that many of the diagnoses of my new species were made from single specimens, and these sometimes imperfect. The various aspects and the differences of the characters of the old and young as well as that of males and females, are often very imperfect, and necessarily therefore some are omitted. The important character of the undulations of the beaks is often omitted on account of the imperfection of the part.

Too much stress cannot be laid on the importance of keeping down the species in all branches of Zoology. Prof. Owen has well remarked that "the coining of names for things glanced at and imperfectly understood, the falsification of signs without due comprehension of the thing signified, becomes a hindrance instead of a furtherance of true knowledge." And Prof. Carpenter, in one of his lectures in 1859, said "there are too many who are far too ready to establish new species upon variations of the most trivial character, without taking the pains of establishing the value of these differences, by ascertaining their constancy through an extensive series of individuals; thus, as was well said by the late Prince of Canino, 'describing specimens instead of species,' and burdening science not only with a useless nomenclature, but with a mass of false assertions. It should be borne in mind that every one who thus makes a bad species is really doing a detriment to science, while every one who proves the identity of a species, previously accounted distinct, is contributing towards its simplification, and is therefore one of its truest benefactors." Dr. Arnott, in *Proceedings of the Royal Society of Edinburgh*, very forcibly says that "to indicate many apparently new species, is the work of an hour; to establish one on a sure foundation, is sometimes the labor of months or years."

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,<sup>2</sup> 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 symphynote and non-symphynote

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<sup>1</sup> The observation of a late French writer that not more than three in one hundred of my species will stand, is too flippant to need much notice. Time will prove that very few will be eliminated.

<sup>2</sup> Vol. vi. p. 76.

*Unionide*. 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., 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 *Nayades* to consist of one genus, *Margaritifera*, which genus he divides into the following subgenera: 1. *Anodonta*; 2. *Iridina*; 3. *Dipsas*; 4. *Triquetra*;<sup>1</sup> 5. *Alasmodonta*; 6. *Unio*.

Swainson, in his *Malacology*, divides the *Nayades* of Lamarck into several sub-Families and a great number of genera, which do not seem to me to possess characteristics sufficiently different to be adopted. They are as follows:—

<i>Unio</i> . Lam.,	represented by	<i>Unio sulcatus</i> . Lea.
<i>Cunicula</i> . Swain.,	“	<i>Unio rubiginosus</i> . Lea.
<i>Ligumia</i> . Swain.,	“	<i>Unio rectus</i> . Lam.
<i>Theliderma</i> . Swain.,	“	<i>Unio lacrymosus</i> . Lea.
<i>Megadomus</i> . Swain.,	“	<i>M. gigas</i> . Swain.
<i>Æglia</i> . Swain.,	“	<i>Unio ovatus</i> . Say.
<i>Naida</i> . Swain.,	“	<i>Unio ater</i> . Lea.
<i>Canthyria</i> . Swain.,	“	<i>Unio spinosus</i> . Lea.
<i>Myseca</i> . Turton,	“	<i>Unio pictorum</i> . Lam.
<i>Potomida</i> . Swain.,	“	<i>Unio sinuatus</i> . Lam.
<i>Lymnadea</i> . Swain.,	“	<i>Unio alatus</i> . Say.
<i>Iridea</i> . Swain.,	“	<i>Unio granosus</i> . Lam.
<i>Castalia</i> . Lam.,	“	<i>Castalia ambigua</i> . Lam.
<i>Naïa</i> . Swain.,	“	<i>Unio corrugatus</i> . Lam.
<i>Hyria</i> . Lam.,	“	<i>Hyria syrmatophora</i> . Lam.
<i>Hyridella</i> . Swain.,	“	<i>Unio australis</i> . Lam.
<i>Iridina</i> . Lam.,	“	<i>Iridina exotica</i> . Lam.
<i>Calliscapha</i> . Swain.,	“	<i>Iridina Nilotica</i> . Sow.
<i>Mycetopus</i> . D'Orb.,	“	<i>Mycet. soleniformis</i> . D'Orb.

<sup>1</sup> Klein. This, it would appear, Baron Ferussac intended should embrace my genus *Symphynota*, as he included all he knew of them except *S. bialata*.

<i>Lamproscapha.</i> Swain.,	represented by	<i>Anodonta siliquosa.</i> Spix.
<i>Symphynota.</i> Lea,	“	“ <i>Unio levissimus.</i> Lea.
<i>Anodonta.</i> Lam.,	“	“ <i>An. cygnea.</i> Lam.
<i>Hemiodon.</i> Swain.,	“	“ <i>An. areolatus.</i> ( <i>edentula.</i> Say.) Swain.
<i>Patularia.</i> Swain.,	“	“ <i>An. rotundus.</i> Spix.
<i>Calceola.</i> Swain.,	“	“ <i>Unio calceolus.</i> Lea.
<i>Alasmodonta.</i> Say,	“	“ <i>Alas. undulata.</i> Say.
<i>Uniopsis.</i> Swain.,	“	“ <i>U. mytiloides.</i> Raf.?
<i>Margaritana.</i> Schum.,	“	“ <i>M. margaritifera.</i> Lin.
<i>Complanaria.</i> Swain.,	“	“ <i>Alas. rugosa.</i> Barnes.

Retzius, *Nova Testiccorum Genera*,<sup>1</sup> 1788, established the genus *Unio*, of which he makes two divisions, viz.:—

\* Without lamellar teeth—

1. *Unio margaritiferus.* Represented by *Mya margaritifera.* Lin.

\*\* With lamellar teeth—

2. *Unio crassus.* “ “ *Unio crassissimus.* Fer.  
 3. *Unio tumidus.* “ “ *Unio ovalis*, of British Zoologists.  
 4. *Unio pictorum.* “ “ *Unio pictorum.* Lin.  
 5. *Unio ovalis.* “ “ *Unio tumidus.* Retz.  
 6. *Unio corrugatus.* “ “ *Unio corrugatus.* Lam.

Mr. Gray, in his excellent *List of Genera (Zool. Soc. Proceedings, 1847)*, divides Lamarck's *Nayades* into three Families, viz.:—

Family 9th. UNIONIDÆ. 10th. MUTELADÆ. 11th. MYCETOPODIDÆ.

The *Unionidæ* consists of nine genera, viz.: *Anodonta*, Cuv.; *Margaritana*, Schum.; *Monocondylæa*, D'Orb.; *Unio*, Retzius; *Barbala*, Humph.; *Lamproscapha*, Swain.; *Anodonta*, Lam.; *Byssanodonta*, D'Orb.; *Glabaris*.

Family 10th. MUTELADÆ consists of five genera, viz.: *Mutela*, Scopoli; *Leila*, Gray; *Pleiodon*,<sup>2</sup> Con.; *Paxyodon*, Schum.; *Prisodon*, Schum.

Family 11th. MYCETOPODIDÆ consists of one genus, viz.: *Mycetopus*, D'Orb.

M. D'Orbigny, in his *Voyage Am. Merid.*, vol. v. p. 594 (1835 to 1843), divides

<sup>1</sup> I have never been able to examine this rare work until recently, it being now in the Library of the Academy of Natural Sciences. The establishment of the genus *Unio* has been usually given, by French authors, to Bruguière, but the English and German writers give it to Retzius so universally, that I have followed them. The author of this dissertation would appear from the title-page to be L. M. Philipsson; Retzius being the presiding officer of the institution. But it is understood to be a fact that papers written by officers of the Universities in Germany have been sometimes published under the names of students as Theses, and it is said that this is one of such cases.

<sup>2</sup> I do not see any reason for throwing out *Iridina* and taking in its place the name of *Pleiodon*, which was unnecessarily given to a shell well known and figured long before, and described both generically and specifically, viz., the *Iridina ovata*, Swain.

the family into genera according to the form of the mantle, the form of the foot, and according to the character of the shell.<sup>1</sup>

“Qui se divisent zoologiquement en plusieurs genres d’après la forme du manteau, la forme du pied, et d’après les caractères seuls de la coquille. On pourrait les diviser ainsi qu’il suit.”

1. Manteau fermé jusqu’au tiers inférieur de la coquille, pourvue des deux tubes distincts, &c. = *Iridina*, Lam.

2. Manteau fermé seulement sur la région anale, où il y a deux tubes distincts, &c. = *Castalia*, Lam.

3. Manteau ouvert sur toute sa longueur, une ouverture anale seule distincte, &c. = *Mycetops*, D’Orb.

4. Manteau ouvert sur toute sa longueur une ouverture anale seule distincte.

A. Coquille pourvue des dents variables à la charnière = *Unio*, Retz.

B. Coquille pourvue d’une seule dent = *Monocondyloea*, D’Orb.

C. Coquille sans dents à la charnière = *Anodonta*, Lam.

Prof. Troschel, in *Wiegmann’s Archives*, vol. xiii. 1847, divides the family, by their anatomical structure, into nine genera, viz.:—

UNIO (Retzius). The mouth lips are wider than long, united as far as the middle on the posterior margin. The margin of the mantle entirely open; the outer branchia united to the mantle to its very extremity; the inner branchia not united to the foot; the foot is tongue-shaped, thick, somewhat produced anteriorly. (*Unio tumidus*, Retz., and *Unio Hopetonensis*, Lea.)

MARGARITANA (Schumacher). (*Alasmodonta*, Say.) The mouth lips are wider than long, united along two-thirds of the posterior margin. The mantle entirely open; the outer branchia is free posteriorly, and lies in a fold of the mantle; the interior branchia is united to the foot anteriorly, but along the greater part of the foot it is free; the foot is tongue-shaped, somewhat produced anteriorly. (*Mya margaritifera*, Lin.,) Tab. 6, Fig. 1.

HYRIA (Lam.) The mouth lips as wide as long, not united. The mantle margin inferiorly is open, posteriorly closed, so as to make a branchial and anal aperture. The outer branchia united to the mantle to its extremity; the interior branchia is united to the foot; the foot tongue-shaped, thick, somewhat produced anteriorly. (*H. sylvatophora*, Lam.,) Tab. 6, Fig. 3.

CASTALIA (Lam.) The mouth lips a little wider than long. The margin of the mantle inferiorly is open, posteriorly so united that the branchial and anal apertures are closed; the branchial aperture is surrounded with cirri; the anal aperture smooth; the outer branchia united to the mantle all the way to its extremity; the inner branchia——(?); the foot tongue-shaped, thick, somewhat produced anteriorly. D’Orbigny, *Voy.*, &c. (*Castalia ambigua*, Lam.)

DIPSAS (Leach). Animal unknown. Shell closed entirely (*Dipsas plicatus*, Leach).

ANODONTA (Lam.) The mouth lips are broader than long, united to the middle of the posterior margin; the mantle margin is entirely open; the outer branchia united to the mantle to its

<sup>1</sup> M. D’Orbigny, in his *Voy. dans l’Am. Mer.*, v. 5, pt. 3, p. 502, says that the eleven genera made by Agassiz out of the *Myæ* may all be placed in existing genera.



extremity; the inner branchia not united to the foot; the foot is thick, tongue-shaped, somewhat produced anteriorly. (*An. cygnea*, Lam.)

IRIDINA (Lam.). Mouth lips longer than wide, not united; mantle margin united as far as the foot, so that the branchial and anal apertures are closed; the outer branchia united to the mantle as far as its extremity; the inner branchia entirely united to the foot; foot thick, tongue-shaped, somewhat produced anteriorly. (*I. cælestis*, Lea.)

SPATHA (Lea). The mouth lips are longer than wide, and not united. The mantle margin is closed behind, so that the branchial and anal apertures are closed; on the under margin the mantle is entirely open; the outer branchia is united to the mantle all the way to its extremity; the inner is not united to the foot; the foot is thick, tongue-shaped, somewhat produced anteriorly. (*S. rubens*, Lea,) Tab. 6, Fig. 2.

MYCETOPUS (D'Orbigny). The mouth lips longer than wide; the mantle margin is open to the anal aperture, which is closed; the outer branchia is entirely united, or grown together; the inner ——(?); the foot is very much produced and widened into a knob. (*M. soleniformis*, D'Orb.)

In *The Shells of New England*, by W. Stimpson, Boston (1851), he states that, in the MSS. of Prof. Agassiz, the following divisions into genera are made (of the New England species) on anatomical differences, viz.:—

UNIO, Retzius, emend. Gills free from the abdominal sac, their posterior extremity attached to the mantle; eggs, in the female, filling the whole extent of the outer gill; mantle fringed at both siphonal openings. (*Unio complanatus*, Lea.)

EURYNEA, Rafinesque, emend. Gills attached to the abdominal sac, leaving no communication between the pedal and the upper gill cavities; eggs received in the sacs of the posterior part of the outer gill; mantle fringed at the posterior half of its ventral edge, and at the branchial and anal siphons. (*Unio prælongus*, Bar.)

LAMPSILIS, Raf., emend. Gills attached; eggs in the posterior part of the outer gill; mantle fringed at both siphonal openings, and having fleshy thickenings and processes at its posterior ventral edge. (*Unio radiatus*, Lam.)

METAPTERA, Raf., emend. Gills attached; eggs in posterior part of gill; a broad expansion of mantle upwards; superanal opening long; both siphonal openings fringed. (*Unio alatus*, Say.)

COMPLANARIA, Swain, emend. Gills free, united to the mantle to its margin; outer gill filling entirely with eggs; superanal opening long; both siphonal openings fringed; palpi united along their posterior edge for two-thirds of their length. (*Alasmodonta rugosa*, Bar.)

MARGARITANA, Schum. Gills free from abdominal sac, their posterior extremity not united to the mantle; anal opening or region of mantle not fringed; branchial fringed. (*Alasmodonta arcuata*, Bar.)

ALASMODONTA, Say, emend. Gills attached to abdominal sac, attached also to the mantle to their extremity; branchial siphon fringed; anal large, not fringed; eggs ——(?). (*Alasmodonta marginata*, Say.)

STROPHITUS, Raf., emend. Gills attached; eggs received in the whole extent of the outer gill; anal opening not fringed. (*Anodonta undulata*, Say.)

ANODONTA, Brug. Gills free; eggs throughout the gill; anal opening not fringed. (*Anodonta Benedictensis*, Lea.)

Soon after the appearance of Dr. Stimpson's publication from Prof. Agassiz's MSS. I tabulated his divisions and those of Prof. Troschel for my own use. To these I occasionally added notes, and I produce the tables here for reference.

#### TROSCHEL'S DIVISIONS OF THE FAMILY UNIONIDÆ.<sup>1</sup>

DIAGNOSIS OF THE FAMILY OF UNIONIDÆ.—Shell with epidermis; without emargination in the mantle; two muscles, the anterior of which makes commonly three impressions in the shell; one exterior ligament; mantle without branchial and anal tubes, and without retractile muscles; two external and two internal mouth lips which are large and rounded, and internally perpendicularly striate; two branchiæ on each side, united to each other behind the foot for the whole length; branchial filaments not separate. All live in fresh water.

	<i>Mouth Lips.</i>	<i>Mantle.</i>	<i>Branchiæ.</i>	<i>Foot.</i>
<sup>2</sup> Unio. Retz. tumidus.	Wider than long, united to mid. post. margin.	Margin entirely open.	Outer united to mantle to extremity. Inner not united to foot.	Tongue-shaped, thick; produced anteriorly.
Margaritana. Sch. margaritifera.	Wider than long, united to $\frac{2}{3}$ post margin.	Entirely open.	Outer is free posteriorly. Inner united to foot anteriorly, but free the greater part.	Tongue-shaped, thick; somewhat produced anteriorly.
Hyria. Lam. syrmatophora.	Wide as long, not united.	Margin inf. open. Post. closed to make branchial and anal aperture.	Outer united to the mantle to extremity. Inner united to the foot.	Tongue-shaped, thick; somewhat produced anteriorly.
Castalia. Lam.	Little wider than long.	Margin inf. open. Post. closed to make branchial and anal apertures.	Outer united to mantle to extremity. Inner ———?	Tongue-shaped, thick; somewhat produced anteriorly.
Dipsas. Leech.	Animal unknown.			
<sup>2</sup> Anodonta. Lam. cellensis.	Wider than long, united to middle of posterior margin.	Margin entirely open.	Outer united to mantle to extremity. Inner not united to foot.	Tongue-shaped, thick; somewhat produced anteriorly.
Iridina. Lam. caelestis.	Longer than wide, not united.	Margin united as far as the foot, so that branchial and anal apertures are closed.	Outer united to mantle to extremity. Inner entirely united to foot.	Tongue-shaped, thick; somewhat produced anteriorly.
Spatha. Lea. rubeus.	Longer than wide, not united.	Margin closed behind, so that the bran. and anal apertures are closed; entirely open on the under margin.	Outer united to mantle to extremity. Inner not united to foot.	Tongue-shaped, thick; somewhat produced anteriorly.
Mycetopus. D'Orb.	Longer than wide.	Margin open to anal aperture, which is closed.	Outer entirely united. The inner ———?	Produced and widened into a knob.

<sup>1</sup> *Wiegman's Archives*, 1847, v. 13.

<sup>2</sup> The genera *Unio* and *Anodonta* are described exactly the same!!

AGASSIZ'S DIVISION OF UNIONIDÆ.<sup>1</sup>

Palpi.	Mantle.	Gills.	Foot.
<sup>2</sup> Unio. Rafz. Emended. U. complanatus. Lea.	Fringed at both siphonal openings.	<sup>3</sup> Free from abdominal sack, post. extremity attached to mantle. Eggs filling extent of outer gill.	
Eurynea. <sup>4</sup> Raf. Emended. U. prælongus. Bar. nasutus. Say.	Fringed at posterior half of ventral edge, and at branch. and anal siphons.	Attached to abdom'l sack. No opening between pedal and upper gill cavities. Eggs in posterior part of outer gill.	
Lampisilis. <sup>5</sup> Raf. Emended. U. radiatus. Lam.	Fringed at both siphonal openings, having fleshy thickenings and processes at post. ventral edge.	Attached. Eggs in posterior part of outer gill.	
Metaptera. <sup>6</sup> Raf. Emended. U. alatus. Say. <sup>7</sup>	Broad expansion upwards. Superanal opening long. Both openings fringed.	Attached. Eggs in posterior part of gill.	
Complanaria. Swain. Emended. Alas. rugosa. Bar. <sup>8</sup>	United along the posterior edge $\frac{2}{3}$ of the length.	Superanal opening long. Both siphonal openings fringed.	Free. United to the mantle to its margin. Outer gill filled entirely with eggs.
Margaritana. Schum. Alas. arcuata. Bar.	Anal opening of mantle not fringed; branchial is fringed.	Free from abdominal sack. Post. extrem. not united to mantle.	
Alasmodonta. Say. Emended. Alas. marginata. Say.	Branchial opening fringed. Anal opening large, not fringed.	Attached to abdominal sack; <sup>9</sup> attached also to mantle to the extremity.	
Strophitus. Raf. Emended. An undulata. Say. <sup>10</sup>	Anal opening not fringed.	Attached. Eggs received in the whole extent of outer gill.	
Anodonta <sup>11</sup> Brug. An. Benedictensis. Lea.	Anal opening not fringed.	Free. Eggs throughout the gill.	

<sup>1</sup> Shells of New England, 1851, by Wm. Stimpson.

<sup>2</sup> U. infucatus, Con. seems in the alcoholic specimen not to have the anal opening fringed. Also, Unio metaeuer, Raf. and lacrymosus, Lea.

<sup>3</sup> U. multiplicatus. Out of five large ones, three were attached the whole length, and two open for a short distance. U. Berlandierii had four out of five attached; the fifth slightly open.

<sup>4</sup> Rafinesque gives no anatomy. This is his generic description of the genus: "Valves very transverse or very large. Axis almost lateral."

<sup>5</sup> Raf. says: "Mollusc like that of Unio, but has apparent short syphons."

<sup>6</sup> Raf. says: "Mollusc like that of Unio."

<sup>7</sup> There is no essential difference in the diagnoses of these three genera.

<sup>8</sup> Alas. rugosa, Bar. has not the anal opening fringed.

<sup>9</sup> Alas. marginata. Six specimens from Mohawk River were all more or less open; some a mere point at posterior end of the foot! See U. Novi-Eboraci; Obs. x. 55. Some attached, some not.

<sup>10</sup> Prof. A. says: "Anal opening not fringed, but it is very minutely fringed."

<sup>11</sup> An. Ferussaciana, Lea, has papillæ on the anal opening.

Unio pustulosus, Lea, has no papillæ or crenulations on the anal opening.

Unio Kleinianus, Lea, has no papillæ, but has slight crenulations.

Unio Forsheyi, Lea, has no papillæ.

Unio Tappanianus, Lea, has no papillæ, but has slight crenulations.

Unio lævisimus, Lea, has no papillæ on the anal opening.

Unio Blandianus, Lea, has no papillæ on the anal opening.

Unio Houstonensis, Lea, has no papillæ.

Unio verrucosus, Bar. has no papillæ.

The very uncertain characters by which Prof. Agassiz proposed to divide this Family induced me to make notes of many species in which the anatomy did not seem to me to accord with his views. His principal character is the opening or closing of the pedal and upper gill cavities. "Gills free from abdominal sac," and "Gills attached to abdominal sac."<sup>1</sup> Another important character is the possession

<sup>1</sup> Shells of New England, by W. Stimpson, p. 13.

or absence of “fringes on the siphonal openings.” I have frequently observed, in different individuals of *the same species*, that this condition—freedom and attachment—was found. It does not, therefore, seem to be worthy of a specific difference, much less a generic one. Thus in five large perfect specimens of *U. multiplicatus*<sup>1</sup> (nobis), I found three to be united the whole length of the branchia, while two were opened for a short distance.<sup>2</sup> In *U. Novi-Eboraci* some were attached and some free. *U. Berlandierii* has branchiæ free and not free. *Alasmodonta marginata*, as emended by Prof. A.: “Gills attached to abdominal sac.” Six specimens from Mohawk River, N. Y. I found to be all more or less open.

As regards the generic character of *Unio* emended, the “mantle fringed at both siphonal openings.” I found the following *Uniones without fringe* (papillæ) on the anal opening, viz.: *triangularis*, *cylindricus*, *pressus*, *ligamentinus*, *lævissimus*, *verrucosus*, *metanevra*, *lacrymosus*, *dehiscens*, and some others. The following have slight crenulations on the anal opening, viz.: *multiradiatus*, *rectus*, *retusus*, *irroratus*, *ovatus*, *purpuratus*, *asper*, *declivis*. The generic character of *Anodonta*, “anal opening not fringed.” The *An. Ferussaciana* has papillæ on the anal opening.<sup>3</sup> *A. Oregonensis* and *A. fragilis* have crenulations on the anal opening.

*Complanaria*, Swain, emended: *Alasmodonta rugosa*, Bar. Prof. A. says: “both siphonal openings fringed.” Specimens from Mohawk, N. Y., had not the anal opening fringed.

Subsequently to the publication by Dr. Stimpson of the MS. diagnoses of Prof. Agassiz, he in *Archiv für Naturgeschichte*, in 1852, divides the “*Najades*” into two large groups:—

*First Group* has exterior gills joined the whole length of the foot, having no direct communication between the lower free cavity and the upper portion, as in *U. Sowerbyanus*, *triangularis*, &c.

*Second Group*. Those which have a *free communication* between the cavity of the gills and the lower cavity of the belly, as in “*Unio irroratus*, *U. lineolatus*, Raf.”

The genera of the *First Division* are:—

1. *Dysnomia*. Ag. . . . *foliatus*. Hild. and *perplexus*. Lea.
2. *Scalenaria*. Raf. (Ag.) *sulcatus*. Lea.
3. *Truncilla*. Raf. (Ag.) *triangularis*. Bar. and *arcaformis*. Lea.
4. *Lampsilis*. Raf. . . . *radiatus*. — — —
5. *Canthyria*. Swain. . . . *spinosus*. Lea.

<sup>1</sup> Two very remarkable characters of some species of *Unio* seem not to have been noticed by Prof. Agassiz: *rubiginosus*, *Kleinianus*, *multiplicatus*, and *subrotundus* have all the *four leaves* of the branchia pervaded by the uterus, and the first and last have *red ova*.

<sup>2</sup> See note in Obs. vii. 40.

<sup>3</sup> Obs. x. 87.

6. *Eurynia*. Raf. . . . *rectus*. Lam.
7. *Metaptera*. Raf. . . . *alatus*, *gracilis*, &c.
8. *Alasmodonta*. Say. . . . *Alas. marginata*. Say. *Marg. Raveneliana*. Lea.
9. *Obovaria*. Raf. . . . *retusus*. Lam.
10. *Micromya*. Ag. . . . *fabalis*. Lea.
11. *Crypogenia*. Ag. . . . *irroratus*. Lea. *dromas*. Lea.
12. *Plagiola*. Raf. . . . *U. securis*. Lea.
13. *Orthonymus*. Ag. . . . *cylindricus*. Say.
14. *Tritogonio*. Ag. . . . *tuberculatus*. Bar.
15. *Quadrula*. Raf. . . . *metanever*. Raf.
16. *Rotundaria*. Raf. . . . *verrucosus*. Bar.
17. *Complanaria*. Swain. . . . *Al. complanata*, &c.
18. *Pleurobema*. Raf. . . . *U. clava*. Lam.
19. *Uniopsis*. Swain. . . . *Al. edentula*. Say.
20. *Margaritana*. Schum. . . . *Al. arcuata*. Bar.<sup>1</sup>
21. *Hemilastena*. Raf. . . . *U. dehiscens*. Say. *oriens*. Lea.
22. *Unio*. Retzius. . . . *U. nasutus*, &c.

In these generic divisions, by D'Orbigny, Troschel, and Agassiz—all founded on anatomical structure—it will be observed that they do not differ essentially in their modes of division; and I do not hesitate to express the opinion that our knowledge of the structural differences of the soft parts of these animals is not yet sufficiently advanced to found a perfect or permanent system. That such a one would be instituted I have not doubted, and I so expressed myself in 1838, in a note on *Anodonta Blainvilliana* (nobis), in my *Synopsis*, 2d ed. p. 31,<sup>2</sup> and I trust that the surviving able physiologists whom I have cited above, will continue to give their labors to an investigation which cannot but produce rich results; but I am disposed to think that, until malacologists have examined carefully the soft parts of most of

<sup>1</sup> Prof. Agassiz says that *Al. arcuata*, Bar. and *Marg. margaritifera*, Schum. differ, in which I do not agree with him.

<sup>2</sup> Aware of the great importance of a knowledge of the *soft parts* of the species of this family, some of which present very different and well-marked characteristics, I have since the publication of the 2d and 3d editions given much time and laborious attention to their careful dissection and diagnoses, sometimes examining more than a hundred individuals of a species. These descriptions of the soft parts have been published in various papers in the *Trans. Am. Ph. Soc.* and *Jl. Acad. Na. Sci.*, and in my *Observations on the Subgenus Unio*, vols. 1, 2, 6, 7, 8, 9, 10, 11, and 12. These descriptions consist of the Subgenus *Unio*, 211; *Margaritana*, 14; *Anodonta*, 26; *Monocondylæa*, 2; *Mycetopus*, 1—in all, the soft parts of 254 species. Many embryonic forms, which have also had my particular attention, and which present such diverse and peculiar forms, have been described and figured by me in the *Jl. Acad. Na. Sci.*, vols. iv. and vi., and *Obs.* v. 6 and 12, so far as I have been able to obtain them.

Very recently I have received from Dr. F. A. Forel, of Morges, Switzerland, his very able Memoir\* on the development of the *Unionidæ*. The anatomy of the embryos, with the illustrations, is worthy of great praise, and cannot fail to be appreciated as an important advance in this direction.

\* Beiträge zur Entwicklungsgeschichte der Najaden. Würzburg, 1867.

the existing numerous species—the exo-skeletons<sup>1</sup> (so to call them) of which have only come under our notice—the facilities which a good system ought to afford cannot be reaped by a partial anatomical knowledge, which does not now embrace, probably, one-fifth of the ascertained species of the family. Besides this, I am not at all disposed to think that we can entirely dispense with the aid we find in the various characters of the exo-skeletons, in making our sub-groups. They often, in fact, afford striking and obvious differences, which the eye schooled with but little experience can with facility and certainty detect, and which, if happily grouped by an experienced eye, may greatly aid the student. These considerations have induced me still to retain nearly the same divisions in this which I used in the third edition, with a few additional divisions.

Messrs. H. and A. Adams, in *The Genera of Recent Molluscs*, vol. ii. 1858, adopt the following *Subgenera of Unio*:—

Banosta. Raf.	Naidea. Swain.
Obovaria. Raf.	Niäa. Swain.
Hyridella. Swain.	Lampsilis. Raf.
Canthyrina. Swain.	Iridea. Swain.
Rotundaria. Raf.	Quadrula. Raf.
Diplodon. Spix.	Dysnomia. Agass.
Metaptera. Raf.	

In vol. iii. of the *Trans. Am. Phil. Soc.*, p. 398, Mr. Nicklin expressed the opinion “that the seven genera, now referred to the Family of *Unionidae*, are founded in artificial distinctions, and not in nature; and that, in fact, the family contains but one genus.”<sup>2</sup>

In consequence of the enormous extent to which the Family *Unionidae* is expanded, it is absolutely necessary to establish many groups and sub-groups, so as to make a systematic arrangement accessible to the student of this branch of zoology. I therefore divide the family into two genera, *Margaron*<sup>3</sup> and *Platiris*. The first is divided into ten subgenera, and the latter into three subgenera. These are again divided

<sup>1</sup> Forming the calcareous coverings and fulera for muscular fibres, as well as protection from exterior forces.

<sup>2</sup> The entire uncertainty of the divisions of Mr. Rafinesque, or their multiplied, useless, and incomprehensible groups, are not deemed important to insert here. Nor the synoptical tables of Mr. Conrad, which differ so much from each other, the last being founded very much on that of Rafinesque.

<sup>3</sup> In the second edition, I proposed the name of *Margarita*, but, this name being pre-occupied by Dr. Leach for a genus separated from *Turbo*, I substituted in the third edition that of *Margaron* (μαργαρον, Unio).

into symphyonote and non-symphyonote, which groups are again divided into plicate, nodulous, spinous, sulcate and smooth shells. Each of these is subdivided into nine groups dependent on the outline of the plane of the valve, viz., into quadrate, triangular, oblique, oval, oblong, subrotund, wide, obovate, and arcuate, as in the following table:—<sup>1</sup>

<sup>1</sup> In regard to priority of claims of date, I have never considered that the old rule of dating the discovery of a species at the time it was read before a scientific society, should have been altered as it has been by many bodies of science. My experience has satisfied me that justice to the discoverer could best be rendered by retaining the old rule. In all cases I adhere to this, and date my papers in accordance, and accord the same to others. It is the custom with the two leading societies of Europe, the French Academy and the Royal Society, as well as the American Philosophical Society in this country, the Asiatic Society of Bengal, and others. The Report of the Committee of the British Association, Aug 1856, recommends a Catalogue of European and American Philosophical Memoirs to be made, and, where published in Transactions, *the date of reading* to be stated. Under the cover of the rule of printed issue, Mr. Conrad\* and Mr. W. G. Binney have misstated dates of many of my species, which dates are erroneous even *under the rule of printed issue*. Thus Mr. Binney, in the publications of the "Smithsonian Collections," *Bibliography of North American Conchology*, Part I. 1863, gives the dates which he finds in the imprint of a volume, although he knew that parts of the volume were issued printed, perhaps years before. I therefore protest against the manifest errors which arise from such proceeding. This is in accordance with the fact that while he published in this volume the erroneous dates of Mr. Conrad's Synopsis regarding my species of *Unionidæ*, he omitted my tables of rectification of these dates, which of course rendered the Bibliography incomplete and was an act of injustice to the science of the country. When the omission was pointed out by me to Prof. Henry, Sec. of the Smithsonian Institution, he kindly promised it should be remedied in an appendix.

In the following year, when Part II. came out, in Appendix to Part II. Mr. Binney inserted a *simple list* of little more than a page of my species *without a single date!* This list was a mere mockery, and the observation that "Mr. Lea having requested that the whole of his '*Rectification*' should be published, I add a list of the species to which he refers in that paper, in addition to those quoted by me on p. 384, Part I." is not the fact.† I never requested Prof. Henry to have the whole of my "*Rectification*" published in this Bibliography; I wished only the *tables of species with dates* of the time read and the time issued printed, and I sent a copy marked as requested by Prof. Henry, to be so inserted. Mr. Binney had given Mr. Conrad over eight pages, double column, for his Synopsis, and to my "*Rectification*" four lines!! Addressing Prof. Henry on this second wrong, he requested another marked copy with the tables I wished to be inserted, and in Appendix iv. 1866, under his own name, I obtained this very slow *partial* justice.

\* Mr. Conrad in his "Catalogue of the Eocene and Oligocene Testacea of the United States," in *Am. Jt. of Sci.*, vol. i., makes some of my species synonyms to his, by dating mine in "1834," while my "Contributions to Geology" was on sale about the first of Dec. 1833, and has the imprint of 1833! It had an extended notice in the Jan. No. following of Silliman's Journal.

† "I send you at once the part of my '*Rectification*' which should have been inserted to neutralize the poison of the '*Synopsis*' of Mr. Conrad."—*Extract of Letter of I. Lea to Prof. Henry*, Nov. 20, 1863.

And in my letter of Feb. 8, 1866, to Prof. Baird, who was attending to the "Smithsonian Collections," I said, "You must be aware that I *never* requested to have my '*Rectification* reprinted.' It was only these important tables of facts and not the argument," &c.

Mr. Tryon, in his excellent "*American Journal of Conchology*," vol. i. p. 270, commenting on these errors of dates says, "Mr. Lea, however, immediately proved the time of publication (printed) of some of these parts of the volumes of Transactions, and, consequently, the prior date of certain of his species by evidence which has never been questioned. Yet Mr. Binney has not deemed it advisable even to mention the dates stated by Mr. Lea, except in regard to four species only, and thus those who in future times depend, as they certainly will, on the Bibliography, for the synonymy of these species, will be misled into the perpetration of a wrong."

## FAMILY UNIONIDÆ.

## I. GENUS MARGARON.

- |   |   |   |
|---|---|---|
| 1. Subgenus <i>Triquetra</i> , <sup>1</sup><br>Having a cardinal and lateral tooth, and furnished with two siphons.                     | { | Symphynote— <i>Hyria corrugata</i> . <i>Lam.</i>  |
| 2. Subgenus <i>Prisodon</i> , <sup>2</sup><br>Having a cardinal and lateral tooth transversely striate, and furnished with two siphons. | { | Non-Symphynote— <i>Castalia ambigua</i> .<br><i>Lam.</i>  |
| 3. Subgenus <i>Unio</i> ,<br>Having a cardinal and lateral tooth.   | { | Symphynote— <i>Unio alatus</i> . <i>Say.</i><br>Non-Symphynote— <i>U. pictorum</i> . <i>Lam.</i>        |
| 4. Subgenus <i>Margaritana</i> ,<br>Having one tooth (cardinal).  | { | Symphynote— <i>Alas. complanata</i> . <i>Barn.</i><br>Non-Symphynote— <i>Al. undulata</i> . <i>Say.</i> |
| 5. Subgenus <i>Plagiodon</i> ,<br>Having a double transverse cardinal tooth   | { | Non-Symphynote— <i>Plag. isocardioides</i> . <i>Lea.</i>  |
| 6. Subgenus <i>Monocondylœa</i> ,<br>Having a simple callus.  | { | Non-Symphynote— <i>Mono. Paraguayana</i> . <i>D'Orb.</i>  |
| 7. Subgenus <i>Dipsas</i> ,<br>Having a linear tooth under the dorsal margin.   | { | Symphynote— <i>Dipsas plicatus</i> . <i>Leach.</i>  |
| 8. Subgenus <i>Anodonta</i> ,<br>Having no teeth.   | { | Symphynote— <i>An. magnifica</i> . <i>Lea.</i><br>Non Symphynote— <i>An. fluviatilis</i> . <i>Dill.</i> |
| 9. Subgenus <i>Columba</i> ,<br>Without teeth, but having an inflected pallæal cicatrix.  | { | Non-Symphynote— <i>Columba Blainvilliana</i> . <i>Lea.</i>  |
| 10. Subgenus <i>Byssanodonta</i> , <sup>3</sup><br>Having no teeth, but is always attached by a byssus.                                 | { | Non-Symphynote— <i>Byssanodonta Paranensis</i> . <i>D'Orb.</i>  |

<sup>1</sup> Since the publication of the second edition of this *Synopsis*, the soft parts of *Triquetra* (*Hyria*, *Lam.*) have been obtained, and Mr. Gray, in the *An. and Mag. Nat. Hist.*, vol. vi., gives us the anatomy. "The mantle lobes of the species of this genus brought from British Guiana by Mr. Schomburgh are united together behind, and furnished with two short, separate, contractile siphons, like the animals of *Iridina* and *Leila*, though the submarginal impression of the shell does not show indications of any inflections behind."

<sup>2</sup> M. D'Orbigny, in his *Voy. Am. Mer.*, vol. v. p. 597, gives a description of the soft parts of *Prisodon* (*Castalia*, *Lam.*). Mantle open the whole length, except at the anal region, where it is closed, and presents two short distinct tubes, of which one—branchial—is larger and furnished with ciliæ round its edge. Buccal appendages rounded, very large. Foot much compressed, thicker and bent behind.

<sup>3</sup> This very remarkable fresh-water bivalve, *Byssanodonta Paranensis*, by D'Orbigny (*Voy. dans*



FAMILY UNIONIDÆ. { II. GENUS PLATYRIS <sup>1</sup> {	1. Subgenus Iridina,	{	Non-Symphynote—I. exotica. <i>Lam.</i>
	Having a granulate dorsal margin, and furnished with two siphons.		
	2. Subgenus Spatha,	{	Non-Symphynote—I. rubens. <i>Desh.</i>
Having a dorsal margin non-crenulate, and furnished with two siphons.			
3. Subgenus Mycetopus,	{	Non-Symphynote—Mye. soleniformis. <i>D'Orb.</i>	
Having a straight, smooth, dorsal margin, and furnished with a long extensile foot.			

After the divisions of Symphynote and Non-Symphynote shells, we have the four conditions in which the outward surface of the shell is found, viz.:—

- |                           |                          |
|---------------------------|--------------------------|
| 1. Plicate. <sup>2</sup>  | 4. Sulcate. <sup>5</sup> |
| 2. Nodulous. <sup>3</sup> | 5. Smooth. <sup>6</sup>  |
| 3. Spinous. <sup>4</sup>  |                          |

Each of these subdivisions group according to the form of their outline, thus:—

- |                             |                             |
|-----------------------------|-----------------------------|
| 1. Quadrate. <sup>7</sup>   | 6. Subrotund. <sup>12</sup> |
| 2. Triangular. <sup>8</sup> | 7. Wide. <sup>13</sup>      |
| 3. Oblique. <sup>9</sup>    | 8. Obovate. <sup>14</sup>   |
| 4. Oval. <sup>10</sup>      | 9. Arcuate. <sup>15</sup>   |
| 5. Oblong. <sup>11</sup>    |                             |

(*Amér. Mérid.*), was observed by him in the Rio Parana above Corrientes. It resembles an *Anodonta*, but remains always attached by a *byssus* proceeding from the foot. It has anterior and posterior adductor muscles. The interior is not *nacrée*. The inner posterior portion is violet-brown; the anterior is white. It is attached to rocks below low-water mark. It has not been as well observed in regard to its habits and anatomy as it deserves to be. M. D'Orbigny places it among the *Unionidæ*, in which family it no doubt will be found properly to belong by its anatomical structure. Unfortunately the soft parts were destroyed before an examination was made. The genera *Etheria*, *Mulleria* (*Acostæa*, D'Orb.), *Galatea*, *Cyclas*, and *Dreissena*; also inhabit fresh water, and have their affinities.

<sup>1</sup> Agassiz, in *Nomenclator Zoologicus*, changes this name to *Platyiris* as being more correct, but Herrmannsen, in *Generum Mollacozorum*, says *Platiris* is correct.

<sup>2</sup> *Unio plicatus*. *Lesueur*.

<sup>5</sup> *Unio Kraussii*. *Lea*.

<sup>3</sup> *Unio pustulosus*. *Lea*.

<sup>6</sup> *Unio complanatus*. *Solan*.

<sup>4</sup> *Unio spinosus*. *Lea*.

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, which is very valuable in discriminating the species.

<sup>7</sup> *Unio asperrimus*. *Lea*.

<sup>12</sup> *Unio circulus*. *Lea*.

<sup>8</sup> *Unio triangularis*. *Barnes*.

<sup>13</sup> *Unio rectus*. *Lam*.

<sup>9</sup> *Unio clavus*. *Lam*.

<sup>14</sup> *Unio modioliformis*. *Lea*.

<sup>10</sup> *Unio ligamentinus*. *Lam*.

<sup>15</sup> *Unio crassus*. *Retzius*.

<sup>11</sup> *Unio complanatus*. *Solan*.

In regarding these outlines, the shell is supposed to be lying on its side with the ligament 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 will be to his right, while the posterior margin will be to his left. This is my mode of arranging my whole cabinet, which contains over 9500 specimens of this family, each differing in sex, age, some characteristic, or in geographical distribution.

In attempting to make a complete synopsis of the *Unionidae*, much labor has necessarily been expended. I do not present this as a perfect work, but it has been made as nearly so as the opportunities in my possession permitted. Errors may have arisen from two sources: first, default of judgment; second, from accident, owing to the mass of research necessary to accomplish the object, considering the crude state the subject has been 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, causing me at an early period to abandon the task of making out his very imperfect descriptions. His own discrepancy in the names sent to Ferrussac,<sup>1</sup> 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 absence 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 malacologists. I am the more fortified in this conclusion, when I see that Mr. Conrad, his most ardent advocate, acknowledges that he (Rafinesque) has made six species from a single one;<sup>2</sup> and the absurdity is still stronger when we turn to M. Rafinesque's monograph, and find that this single species has furnished *several genera*, and is placed, in fact, in *two different sub-families!!!*

How far M. Rafinesque ought to be considered worthy of authority at home and abroad may be understood by the opinions of the following distinguished writers.

The late Dr. Binney, in his admirable work on "Terrestrial Mollusques of the United States," says the papers of Rafinesque "are not deemed worthy of any con-

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<sup>1</sup> "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 des 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."—*Magasin de Zoologie*, 1835, Class v., Nos. 59 et 60, p. 13.

<sup>2</sup> *U. triangularis*. Conrad's *Synoptical Table of New Fresh Water Shells of the United States*, p. 72.

sideration:" vol. i. p. 36: "that they are considered to be destitute of authority, and entirely unworthy of notice." p. 48.

Prof. Asa Gray considered Mr. R. as entirely unworthy of authority, stating that "half his genera and species do not exist at present," and that he described in "Natural History style twelve new species of thunder and lightning."—*Am. Jl. Sci.*, 1841.

Deshayes, *Traité Élémentaire*, vol. ii. p. 198, says that Mr. R. has fallen into a deplorable excess, inspiring no confidence, giving descriptions of that which he did not know.

The following note is from one of the very best of authorities among recent writers:—

"It is much to be regretted that some modern naturalists have tried to find out and bring into use the obscure genera of Risso and the worthless fabrications of Montfort and Rafinesque, which had better have remained unknown."—*Woodward's Rudimentary Treatise*, p. 136.

Did any naturalist ever believe in Mr. R.'s *Tremesia patelloïdes*, a trivalve shell of the Ohio river? (Monographie, p. 54, pl. 82, f. 22 and 24, in *An. Gén. des Sci. Phys. à Bruxelles*, 1820) the three valves of which, with the soft parts, he describes and figures in three views without pretending to have seen it, as he stated in the *Am. Monthly Mag.*; and that he described it from the information of Mr. Audubon, who, it is believed, practised some joke upon him at Louisville, as appears in Mr. Audubon's Memoirs.

In regard to the Catalogue published last year by Baron Ferussac, in which he gives precedence to many of Mr. Rafinesque's names, it must be remembered that this has been done on the authority of others, and not from his inspection of the specimens themselves. Had he known the manner in which these claims had been brought forward, he certainly would have admitted them with doubt, if he admitted them at all.

The observation of Prof. Agassiz in *Archiv für Naturgeschichte*, 1852, that "if the American Naturalists had followed Rafinesque's track, instead of despising him we should have gained a good while ago a treasure of important additions to the anatomy of this family," will surprise most students of American Natural History. I am not aware that a single cotemporary writer considered him worthy of authority or reliance of any kind. I so far disagree from Prof. Agassiz that I believe with some of our most distinguished naturalists that if Mr. Rafinesque had never written a word on the subject of American Malacology and other branches of Natural History, we should have been *more* advanced than we are now; for even Prof. Agassiz himself has been troubled to exhume Mr. Rafinesque's genera, as he states in this paper that

the genera *Amblema* and *Ellipsaria* "are good for nothing," that we can neither make use of these names nor of his *Obliquaria*: and further, "there are several other genera of Mr. Rafinesque's, indeed, that I know not how to dispose of."! If Prof. A. finds it so difficult to follow Mr. Rafinesque's tracks, how can he blame the early American naturalists, who had so much less light than himself?<sup>1</sup> The prejudice expressed above against "American Naturalists" is not warranted, and the whole career of the unfortunate Mr. Rafinesque in this country was not such as to excite the sympathy and the universal good feeling which existed among our early naturalists. When I commenced the study of our Fresh Water Shells I found that my predecessors, Messrs. Say and Barnes, did not credit him with a *single species*; they could not be satisfied of the identity of one. Other naturalists—Griffith, Hyde, Peale, Green, and Stewart—thought three or four could be relied on, and these I adopted. I believe I was the first writer to allow him one. I studied his works faithfully, without prejudice, and certainly without profit, losing much time ineffectually.

In 1836 the Ohio naturalists, Dr. Hildreth, Dr. Kirtland, Dr. Ward, Judge Tappan, Mr. Buchanan and Mr. Clark, after much consultation, made out a list for western naturalists to be finally adopted. They made out 119 species, of which they gave Mr. Rafinesque one, and that with doubt.

Subsequently, when jealousies arose, Mr. Say and Mr. Conrad in 1834 published synoptical tables with the specimens of the North American *Unionidæ* before them, which it was said Mr. Rafinesque had labelled, but they could not with this light give any certainty to Mr. R.'s species, as these tables differ so much as to types and synonyms as to neutralize what their authorities might otherwise have been. The animus of Mr. Say's synopsis may be understood in the fact that in it he did not give me a single species! while Mr. Conrad gave me twenty, and those evidently with reluctance.

The first entry of Mr. Conrad's Synopsis is *U. abruptus*, Say=*cyclips*, Raf., and *calendis*, Raf. Mr. Say's Synopsis does not claim this species, nor does he enter Mr. Rafinesque's two names at all. Mr. Conrad gives *ater*, Lea=*lugubris*, Say. Mr. Say reverses this, and makes my *ater* the synonym. Mr. Conrad gives *cyphius*, Raf.=*cicatricosus*, Say. While Mr. Say claims for himself *cicatricosus* as a type, &c. &c.

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<sup>1</sup> Prof. Leidy has been more fortunate in another line of investigation, as he has shown in "*Extinct Mammalia of North America*," p. 376; that he found, in the examination of Mr. Rafinesque's fossil mammals that he had made *three fossil genera* from the bones of the common recent deer, *Cervus Virginianus*.

THE

FAMILY UNIONIDÆ.



FAMILY NAIADES.—*Lamarck.*

GENUS MARGARON.

I. SUBGENUS TRIQUETRA.<sup>1</sup>

All the species preceded by an \* are in my Cabinet. The inner column forms the Synonyms.

SYMPHYNOTE TRIQUETRA.	ELIGATE.	TRIANGULAR.	SYMPHYNOTE TRIQUETRA.	SMOOTH.	TRIANGULAR.
		* <i>corrugata.</i> Lam. <i>Hyria corrugata.</i> Lam. Sow. Chenu. <i>Hyria rugosa.</i> Cuv. <i>Hyria rosea.</i> Lefev. Pot. <i>Hyria transversa.</i> Hupé. <i>Tellina rosea.</i> Bonh. <i>Mya angulata.</i> Wood. <i>Unio rugosus.</i> Wagner. <i>Paxyodon ponderosus.</i> Schum. <i>Triplodon rugosum.</i> Spix.			<i>Hyria avicularis.</i> Lam. Child. <i>Crouch.</i> Desh. Guerin. Chenu. <i>Han.</i> <i>Hyria syrmatophora.</i> Sow. Cuv. <i>Schom.</i> Swain. Hupé. Han. <i>Unio corrugata.</i> Blain. <sup>2</sup> <i>Hyria elongata?</i> <sup>3</sup> Swain. <i>Hyria cordata.</i> Menke. <i>Hyria complanata.</i> Hupé. <i>Hyria Castelnarii.</i> Hupé. <i>Unio caudatus.</i> Wagner. <i>Unio syrmatophora.</i> Desh. <i>Prisodon obliquus.</i> Schum. <i>Diplodon furcatum.</i> Spix.
	SMOOTH.	* <i>subviridis.</i> Klein. <i>Mya syrmatophora.</i> Gronovius. Gmel. Wood. Dill. Schreib. Schröt.			

<sup>1</sup> The shell known to zoologists generally as *Hyria corrugata*, Lam., was long before placed by Klein under the generic name of *Triquetra* (*Tentamen Methodi*, 1753, p. 135, Pl. 9, Fig. 36), and Ferussac adopted it, very properly, in preference to *Hyria*. In my former editions, I placed *Hyria* in the subgenus *Unio*, but the animal has been found to possess two syphons, which ought, with other obvious differences, to separate it from *Unio* (*Gray, Annals of Nat. Hist.*, Dec. 1840). Troschel, in *Wiegmann's Archives*, describes the soft parts and the cicatrices. The cicatrices in the *H. corrugata*, he says, differ; which is true, as in the genus *Hyria* there exists usually a very well marked cicatrix, which is deeply impressed, distinct, and lies *over* the great anterior adductor cicatrix. He also says that the *Unio delphinus* belongs to this genus, as well as a new shell, *Hyria humilis*, from Guiana, described by him.

<sup>2</sup> The figure of Blainville, pl. 67, fig. 1, is evidently the smooth *Triquetra*, and no doubt is *subviridis*.

<sup>3</sup> Mr. Gray thinks this is a "perfectly distinct species." I have never seen the shell, and feel too much in doubt to insert it as such.





II. SUBGENUS PRISODON.<sup>1</sup>

NON-SYMPHYNOTE PRISODONTES.	PLICATE.	TRIANGULAR.	NON-SYMPHYNOTE PRISODONTES.	PLICATE.	TRIANGULAR.
		*truncatus. Schum.			Unio ambigua. Blain. Desh. Sow.
		Cast. ambigua. Lam. D'Orb. Cuv.			Mya ambigua. Wood.
		Sow. Guerin. Pot. Schum.			Tetraplodon pectinatum. Spix.
		Swain. Chenu.			
		Cast. quadrilatera. D'Orb. <sup>2</sup>			
		Cast. inflata. D'Orb.			nodulosus. <sup>5</sup> Wood.
		Cast. turgida. <sup>3</sup> Hupé.			Mya nodulosa. Wood. Dill.
		Cast. retusa. Hupé.			Chama plumbea. Mühlf.
		Cast. acuticosta. Hupé.			Unio plumbeus. (Imp. Cab. in Vienna.)
		Cast. multisulcata. Hupé.			
		Cast. Castelnauii. Hupé.			
Cast. Crossiana. Hidalgo. <sup>4</sup>					
Cast. cordata. Hump. H. & A.					
Adams.					
		SMOOTH.			Duprei. Recluz. <sup>6</sup> Chenu.

<sup>1</sup> Schumacher, in his *Nouveau Système*, 1817, p. 138, formed the genus *Prisodon*, in which he included the two now well known shells *Hyria serratophorus* and *Castalia ambigua*. His name for the first cannot be applied, as Klein, in 1753, preoccupied this genus by naming it *Triquetra*. Therefore it must be applied to *Castalia*, which name was given to the same shell by Lamarek in 1819. Mr. Gray, in his "Genera," gives Schumacher priority in the name of *Prisodon*, in which he is perfectly correct.

<sup>2</sup> I owe to the kindness of M. D'Orbigny specimens of this and *inflata*. I regret, however, that I am compelled to differ in opinion with this distinguished naturalist, believing, as I do, that there have been as yet observed but three species of *Prisodon* (Lamarek's *Castalia*).

<sup>3</sup> I have all these five forms of M. Hupé's in my collection, and have always esteemed them the *truncatus* Schum.

<sup>4</sup> I have seen no specimen, nor has M. Hidalgo given a figure; but I suspect that *Crossiana* is a more perfect specimen of *ambigua* than usual. I may, however, be entirely mistaken in this opinion.

<sup>5</sup> In my second edition, p. 22, this shell was placed among the *Uniones*, with a note as to its analogues and its habitat. On my visit to Vienna in 1853, I found, in the Imperial cabinet, the right and left valves of two individuals under the name of *Chama plumbea* Mühlfeld, but then labelled *Unio plumbeus*. Having serrated teeth, it properly belongs here. See Proc. Acad. Nat. Sci., vol. 6, p. 368.

<sup>6</sup> A fine specimen is in the museum of the Academy of Natural Sciences of Philadelphia.

III. SUBGENUS UNIO.<sup>1</sup>

SYMPHYNOTE UNIONES.		SYMPHYNOTE UNIONES.	
PLICATE.	TRIANGULAR.	SMOOTH.	TRIANGULAR.
	*Cumingii. <i>Lea.</i> <i>Unio Cumingii.</i> <i>Reeve.</i> <sup>2</sup> (No. 264.)		*Hainesianus. <i>Lea. Mart.</i> <i>Unio imperialis.</i> <i>More.</i>
	<i>gigas.</i> <i>Swain. Lea.</i> <i>Megadomus gigas.</i> <i>Swain.</i>		subtrigonus. <i>Sow.</i> <sup>3</sup>
	*Nicklinianus. <i>Lea. Han.</i>		*superbus. <i>Lea.</i> <i>Unio macropterus.</i> <sup>4</sup> <i>Dunk.</i> <i>Unio velaris.</i> <i>Bens.</i>
	*eximius. <i>Lea. Mart.</i>		*gravidus. <i>Lea. Mart.</i> <i>Unio abnormis.</i> <i>More.</i>
	*Boykinianus. <i>Lea. Chenu.</i>		*delphinulus. <sup>5</sup> <i>More.</i>
	*inflatus. <i>Lea. Küst. Han.</i> <i>Symph. inflata.</i> <i>Lea, in Trans. Am.</i> <i>P. S.</i> <i>Unio Alabamensis.</i> <i>Con.</i>		*lævissimus. <i>Lea. Adams. Han.</i> <i>Symph. lævissima.</i> <i>Lea. Sh. &amp; Eat.</i> <i>Swain.</i> <i>Unio lævissima.</i> <i>Deshayes.</i>
	*delphinus. <i>Grun. Lea. Küst. Chenu.</i>		*Myersianus. <i>Lea.</i>
	*alatus. <i>Say. Lam. Swain. Bar.</i> <i>Hill. Menke. Adams. Küst.</i> <i>Dekay. Potier. Deshayes. Con.</i> <i>Sow. Chenu. Han.</i> <i>Mya alata.</i> <i>Wood. Eat.</i> <i>Symph. alata.</i> <i>Lea. Sh. &amp; Eat.</i> <i>Lymnadia alata.</i> <i>Sow. Swain.</i> <i>Metaptera alata.</i> <i>Stimpson. (Agass.</i> <i>MSS.)</i>		Ortonii. <i>Lea.</i>
	*Heermannii. <i>Lea.</i>		*Housei. <i>Lea. Mart.</i>
	*gracilis. <sup>6</sup> <i>Barnes. Hill. Desh. Han.</i> <i>Adams.</i> <i>Unio planus.</i> <i>Barnes.</i> <i>Unio fragilis.</i> <i>Swain. Küst.</i> <i>Symph. gracilis.</i> <i>Lea. Sh. &amp; Eat.</i>		

<sup>1</sup> Retzius, Nova Testaceorum Genera, 1788.<sup>2</sup> Judging from the figure of Reeves, I should think it had been taken from *Marg. complanata*, Barnes.<sup>3</sup> The figure is very much like that of *Hainesianus*, Lea, and may be a half grown specimen.<sup>4</sup> Dr. Dunker received it from Danu-Luar River, Sumatra.<sup>5</sup> A well-characterized species from Honduras.<sup>6</sup> Mr. Swainson's description of *fragilis* appeared in his *Zool. Ill.*, dated 1822-1823; and Mr. Barnes's in *Silliman's Journal* for April, 1823. As I do not know which really was issued first, I have preferred to give preference to Mr. Barnes's name, by which the shell has been universally known among our conchologists.

SYMPHYNOTE UNIONES.	SMOOTH.	TRIANGULAR.	NON-SYMPHYNOTE UNIONES.	PLICATE.	QUADRATE.
		<i>Mya plana.</i> Eat. <i>Mya gracilis.</i> Eat. <i>Metaptera gracilis.</i> Stimpson. (Agass. MSS.)			<i>Unio heros.</i> Say, Am. Conch. No. 6. <i>Con.</i> <i>Unio atrocostatus.</i> Reeve, No. 13.
		OVAL.			*Eightsii. Lea.
		*generosus. Gould. <sup>1</sup> Blan.			*Neislerii. Lea.
		OBLONG.			*undulatus. Bar. Valen. Hill. Desh. <i>Chenu. Han.</i>
		*pressus. <sup>2</sup> Lea.			<i>Unio costata?</i> Raf.
		<i>Symph. compressa.</i> Lea.			<i>Unio costatus.</i> Con.
		<i>Complanaria alasmodontina.</i> <sup>3</sup> Stimpson. (Agass. MSS.)			<i>Unio plicatus.</i> Con.
		<i>Unio compressus.</i> Con. Adams. <sup>4</sup>			<i>Mya undulata.</i> Eat.
		<i>Linsley. Dekay. Han.</i>			
		*decoratus. Lea.			*perplicatus. Con. <i>Unio Pearlensis.</i> Con.
NON-SYMPH. UNIONES.	PLICATE.	QUADRATE.			*atrocostatus. Lea.
		*atromarginatus. Lea. Chenu.			*Elliottii. Lea.
		*multiplicatus. <sup>5</sup> Lea. Kirt. Potier. <i>Chenu. Han.</i>			
		<i>Unio heros.</i> Say, in Disseminator.			
		<i>Unio undulatus.</i> Say, Am. Conch. No. 2, Pl. 16, Deshayes.			

<sup>1</sup> Dr. Gould (Boston Nat. Hist. Soc., April, 1847) says it resembles *Margaritana Vondembushiana*, Lea, now transferred to *Monocondylæa*, D'Orb.

<sup>2</sup> In the *Proceedings of the Am. Phil. Soc.*, vol. ii. p. 237, I changed *compressus* into *pressus*, the former name having been used by Sowerby for a fossil species.

<sup>3</sup> Where did Barnes describe "*Unio Alasmodontinus*, Barnes," as quoted by Agassiz?

<sup>4</sup> "*Fresh water and land shells of Vermont.*" His variety *plebeius* does not seem to me to differ. My brother, T. G. Lea, stated to me that he thought the *U. pressus* properly belonged to the genus *Margaritana*, and that the charged ovisacs were like those of *M. complanata*. In all the fifteen which he found during several years, the ovisacs were charged. I have since examined a female, and find this species has in the soft parts other characters like *Margaritana*, but not completely so, and having true lateral teeth, it must be placed with *Unio*.

<sup>5</sup> 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*. The figure of Mr. Say in *American Conch.*, pl. 16, is certainly not *U. undulatus*, Bar., as he supposed. It is undoubtedly my *multiplicatus*, as a comparison of the two figures will prove. Mr. Say refers to Barnes's fig., *Am. Jl. of Science*, vol. vi. pl. 2, as being the same with this; but a comparison will show that they are not alike in outline, in folds, nor in the beaks.

NON-SYMPHYNOTE UNIONES.	PLICATE.	QUADRATE.	NON-SYMPHYNOTE UNIONES.	PLICATE.	TRIANGULAR.
		* <i>plicatus</i> . <sup>1</sup> <i>Lesueur. Say. Bar. Sh.</i> <i>&amp; Eat. Hild?</i> <sup>2</sup> <i>Swain. Chem.</i> <i>Han.</i>			* <i>Nyassensis. Lea.</i> <i>Unio Nyassæ. Sow.</i>
		<i>Unio Peruviana. Lam.</i>			* <i>Aferulus. Lea.</i>
		<i>Unio variplicata. Lam. Desh.</i>			* <i>dimotus. Lea.</i> <i>Unio Sumatrensis.</i> <sup>4</sup> <i>Lea.</i>
		<i>Unio Dombeyanus. Valen.</i>			<i>Lampreyanus. Baird &amp; Adams.</i>
		<i>Unio undulata. Desh.</i>			<i>Chinensis. Lea.</i>
		<i>Unio multiplicata. Desh.</i>			OBLIQUE.
		<i>Unio crassus. Barnes.</i>			<i>Tientsinensis. Crosse &amp; D.</i>
		<i>Mya plicata. Eat.</i>			<i>tortuosus. Lea.</i> <i>Unio subtortus. Baird &amp; Ad.</i>
		* <i>infucatus. Con.</i> <i>Unio securiformis. Con.</i>			<i>Swainsoni.</i> <sup>5</sup> <i>Sow. Reeve.</i>
* <i>Kleinianus. Lea.</i> <i>Unio liratus. Shuttleworth.</i>	OVAL.				
* <i>nucleus. Lea. Mart.</i>	* <i>corrugatus. Retzius. Speng. Lam.</i> <i>Desh. Blan. Han.</i> <i>Mya corrugata. Müller. Chem.</i> <i>Schröt. Gmel. Wood. Dill.</i> <i>Schreib. Menke.</i> <i>Mya rugosa. Gmel. Wood. Dill.</i> <i>Schreib.</i> <i>Mya nodosa?</i> <i>Gmel. Wood. Dill.</i> <i>Mya spuria. Gmel. Wood. Schreib.</i>				
<i>Napeanensis. Con.</i> <i>Unio dorsuosus. Gould.</i>					
TRIANGULAR.					
* <i>psammoicus. D'Orb. Hupé.</i>					
* <i>foliatus.</i> <sup>3</sup> <i>Hild. Chem. Han.</i> <i>Unio flexuosus. Con.</i>					
* <i>cælatus. Con. Han.</i>					
* <i>Kirkii. Lea.</i>					

<sup>1</sup> A difficulty exists in the minds of some naturalists as to whom this name properly belongs, and it is often given to Mr. Say. Mr. Lesueur gave the first specimen obtained to Mr. Say under this name; but Mr. Say, believing it to be only a variety of *crassus*, so stated in *Nicholson's Ency.*, Am. ed. It still, however, kept the name of *plicatus*, Lesneur, without any description, until Mr. Barnes, in *Am. Jl. of Science*, 1823, p. 120, described it as Lesueur's. Therefore, if not Lesueur's, it is Mr. Barnes's species.

<sup>2</sup> It is extremely difficult to make out the species described by Dr. Hildreth in the *American Journal of Science*. It appears, from a note by the editor, that he did not insert all the figures sent by Dr. H., but left out those which Mr. Barnes had already, as he thought, figured in the *Journal*. Unfortunately, in this omission Mr. Barnes's figures are not referred to, and we are, therefore, in doubt whether Dr. H. recognized, justly or not, Mr. Barnes's species.

<sup>3</sup> 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 think that the folds of the growth, particularly in the male shells, require it to be placed here.

<sup>4</sup> *Sumatrensis* being preoccupied by Dr. Dunker, I change the name to *dimotus*.

<sup>5</sup> Mr. Sowerby substituted this name for *Unioopsis radiatus* and *mytiloides*, Hanley, both being preoccupied.

## OVAL.

- Mya Galitana.* Lin. Schreib.  
*Unio spuria.* Lam.  
*Unio triradiata.* MSS. in Museum at Paris.  
*Unio fulmineus.* Phil.  
*Potamida corrugata.* Swain.  
*Naia corrugata.* Swain.
- Burtoni. Woodw. Reeve.
- Indicus. Sow. Reeve.
- \*Tavoyensis. Gould. Blan.  
*Unio parma.* Ben.
- \*crespisulcatus. Ben. Blan.
- \*occeatus. Lea. Blan.
- \*asperulus. Lea.
- \*pliciferus. Lea. Chenu. Han.  
*Unio carbonarius.*<sup>1</sup> Lea. Chenu.  
*Unio pleaxus.* Con.  
*Unio erocodilorum.* More.
- \*rusticus. Lea. Mart.
- diminutus. Lea.
- \*laticostatus. Lea.
- \*hippopæus. Lea.

## OBLONG.

- \*Sloatianus. Lea. Chenu.  
*Unio aratus.* Con.  
*Unio plectoformus.* Con.
- \*rufofuscus. Lea.
- navigioliformis. Lea.
- plicatulus. Lea.
- hyleus. D'Orb. Schom.  
*Unio Guarianus.* D'Orb.
- \*trapezoides. Lea. Chenu. Han.  
*Unio crassidens.* Lam. Var. a.  
*Unio interruptus.*<sup>2</sup> Say. Desh.
- Homsensis. Lea.
- SUBROTUND.
- \*Brazosensis. Lea.
- \*Lineccumii. Lea.
- WIDE.
- \*ellipticus. Spix. Mori.  
*Diplodon ellipticum.*<sup>3</sup> Spix.  
*Unio multistriatus.* Lea. D'Orb.  
 Han.  
*Unio psammactinus.* Phil.
- \*Japanensis. Lea.
- \*eucumoides. Lea. Chenu.  
*Unio Cumingii.* Dunk.<sup>4</sup>

<sup>1</sup> *U. carbonarius* is the old and eroded of *pliciferus*.

<sup>2</sup> Mr. Say, in his "Synonymy," claims precedence in this species, although 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.

<sup>3</sup> I have no doubt of *D. ellipticum* being the same with my *Unio multistriatus*, and it is a true *Unio*. Mr. Barnes gave the same specific name to an American *Unio*, but it had been previously described by Lamarek as *ligamentinus*.

<sup>4</sup> Comes from Richmond River, Australia. *Zeitschrift für Malak.*, 1846, p. 109.

NON-SYMPHYNOTE UNIONES.	WIDE.	NON-SYMPHYNOTE UNIONES.	WIDE.
	*subtentus. <i>Say. Con. Desh. Han.</i>		*Shurtleffianus. <i>Lea. Blan.</i>
	*Hembeli. <i>Con.</i>		*gratiosus. <i>Phili.</i>
	*Osbeckii. <i>Phili.</i>		*humilis. <i>Lea. Mart.</i>
	<i>Unio Shanghaiensis. Lea.</i>		*Dunkerianus. <i>Lea.</i>
	<i>Unio digitiformis. Sow.</i>		*Murchisonianus. <i>Lea. Chenu. Han.</i>
	*Wrightii. <i>Lea.</i>		<i>Unio Douglasiæ.<sup>1</sup> Gray. Baird &amp; Adams.</i>
	*Conradianus. <i>Lea. Han.</i>		*nuxpersicus. <sup>2</sup> <i>Dunk.</i>
	*rubellinus. <i>Lea.</i>		*Grayanus. <i>Lea. Chenu. Han.</i>
	*acutissimus. <i>Lea. Con. Chenu. Han.</i>		<i>Unio Grayii. In Griffith's Cuvier.</i>
	*parvulus. <i>Lea.</i>		ARCUATE.
	*penicillatus. <i>Lea.</i>		*ponderosus. <i>Sol. Han.</i>
	<i>Natalensis. Lea.</i>		<i>Mya ponderosa. Solan. Dill.</i>
	*phaselus. <i>Lea.</i>		<i>Mya crassa. Wood.</i>
*scobinatus. <i>Lea.</i>	<i>Vignonana. Reeve.</i>		
<i>Unio Mandarinus. More.</i>	QUADRATE.		
<i>Unio pellis-lacerti. More.</i>	*lacrymosus. <sup>3</sup> <i>Lea. Chenu. Han. Sh. &amp; Eat.</i>		
fluctiger. <i>Lea.</i>	<i>Theliderma lacrymosa. Swain.</i>		
crispatus. <i>Gould. Blan.</i>	<i>Unio quadratus. Reeve.</i>		
	*Forsheyi. <i>Lea.</i>		

<sup>1</sup> In Jardines's *Mag. Zool. and Botany*, vol. i. p. 285, Mr. Gray claims precedence for his name *Douglasiæ*. He published it in Griffith's *Cuvier*, bearing the date of 1834. My description, published in the *Trans. Am. Phil. Soc.*, vol. 5, dates March 16, 1832. (*Note* 1867. Messrs. Baird and Adams, in *Zool. Proc.*, May 9, 1867, are entirely incorrect in making *Murchisonianus* (1832) a synonym to *Douglasiæ* (1834), saying that "Mr. Lea some years after described and figured a species from China," &c. Quite the contrary; I described it, some years before, in the *Trans. Am. Phil. Soc.*, vol. 5. In the same paper, Messrs. Baird and Adams say that "after a careful examination of the description and figure of *U. Shanghaiensis* (*Lea*), they are satisfied that it is the same, and that the name of *Douglasiæ* must therefore stand." That "the three species are identical." This is another error. *Shanghaiensis* is really the same as *Osbeckii*, *Phili.*, with which I have some years since placed it in my MS. for this edition of *Synopsis*.)

<sup>2</sup> The specimen given to me by Dr. Dunker is so much like a young *Murchisonianus*, *Lea*, that I think it will prove to be the same species.

<sup>3</sup> 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 believe it to be distinct. Dr. Ward says they "are certainly distinct."

NON-SYMPHYNOTE UNIONES.

NODULOS.

QUADRATE.

- \*speciosus. *Lea.*
- \*asperrimus.<sup>1</sup> *Lea. Han.*  
*Unio quadrulus.*<sup>2</sup> *Say. Con.*  
*Unio nobilis. Con.*
- \*Rumphianus. *Lea.*
- \*Blandianus. *Lea.*
- \*fragosus.<sup>3</sup> *Con. Han.*
- \*Phillipsii. *Con. Küst. Han.*
- \*Cincinnatiensis.<sup>4</sup> *Lea. Chenu.*
- \*pustulatus. *Lea. Chenu. Han.*  
*Unio nodulatus. Con.*
- \*Schoolcraftii.<sup>5</sup> *Lea. Han.*  
*Unio prasinus. Con.*  
*Unio nodiferus. Con.*

TRIANGULAR.

- \*apiculatus. *Say. Con. Chenu. Han.*
- \*asper. *Lea. Chenu. Han.*
- \*Dorfeullianus. *Lea. Chenu. Han.*
- \*stapes. *Lea. Con. Chenu. Han.*
- \*tuberosus. *Lea. Chenu.*

NON-SYMPHYNOTE UNIONES.

NODULOS.

TRIANGULAR.

- \*sparsus. *Lea. Chenu.*
- \*metanevrus. *Raf. Con. Küst. Sh. & Eat. Han.*  
*Unio nodosus. Bar. Hild. Chenu.*  
*Unio rugosus (Flat). Bar. Hild. Adams.*  
*Telederma metanevra. Swain.*  
*Mya nodosa. Eat.*  
*Mya rugosa. Eat.*
- \*Wardii. *Lea.*
- \*intermedius. *Con.*
- \*cornutus. *Bar. Han.*  
*Mya cornuta. Eat.*  
*Unio reflexa? Raf.*  
*Unio reflexus. Con.*  
*Unio torulosus. Raf. fide Sh. & Eat.*

SUBROTUND.

- \*pustulosus. *Lea. Chenu. Han.*  
*Unio verrucosus. Bar. Var. b.*  
*Unio verrucosa. Valen.*  
*Unio verrucosus albus. Say; but not of Hildreth.<sup>6</sup>*  
*Unio bullatus. Con.*
- \*spæricus. *Lea.*
- \*asperatus. *Lea.*

<sup>1</sup> 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, recognizes his *rugosus* as *U. Peruriana*, Lam., which shell is undoubtedly the *plicatus*, Lesueur and Say.

<sup>2</sup> This variety of *asperrimus* I have had in my cabinet for about twenty-five years, and always regarded it as too similar in its characters to raise it to a distinct species.

<sup>3</sup> This shell has been considered the female of *asperrimus* (nobis), but I have no doubt of its being distinct. Some of our best western naturalists think it to be the true *rugosus* of Barnes.

<sup>4</sup> This may be found to be the male of *Phillipsii* *Con.*, when the soft parts shall be examined.

<sup>5</sup> Prof. Kirtland thinks this may prove only a variety of *pustulosus* (nobis), but I am not of that opinion.

<sup>6</sup> A specimen sent to me by Dr. Hildreth as *Unio verrucosus albus*, proved to be a true *irroratus* (nobis).

NON-SYMPHYNOTE UNIONES.	NODULOUS.	SUBROTUND.	NON-SYMPHYNOTE UNIONES.	NODULOUS.	SUBROTUND.
		*Kienerianus. <i>Lea.</i>			*grandidens. <i>Lea.</i>
		*vallatus. <i>Lea.</i>			OBLIQUE.
		*turgidus. <i>Lea. Chenu. Han.</i>			*Æsopus. <i>Green. Han.</i>
		<i>Unio Mortoni. Con.</i>			<i>Unio cicatricosus. Con.</i>
		*Cooperianus. <i>Lea. Kirtl. Han.</i>			<i>Unio cyphius. Con.</i>
		*verrucosus. <i>Bar. Sh. &amp; Eat. Chenu.</i>			*varicosus. <i>Lea. Chenu. Han.</i>
		<i>Han.</i>			<i>Unio cicatricosus? Say.<sup>1</sup></i>
		<i>Unio tuberculata? Raf.</i>			<i>Unio cicatricosus. Con.</i>
		<i>Unio tuberculosa. Valen.</i>			*perplexus. <i>Lea. Kirtl. Chenu. Han.</i>
		<i>Unio verrucosus purpureus. Hild.</i>			<i>Unio gibbosus? Raf.</i>
		<i>Unio tuberculatus. Con.</i>			<i>Unio gibbosus. Con. Küst. (Fig. 3.)<sup>2</sup></i>
		<i>Mya verrucosa. Eat.</i>			<i>Unio gubernaculum. Reeve.</i>
		*refulgens. <i>Lea.</i>			*propinquus. <i>Lea.</i>
		*graniferus. <i>Lea. Chenu. Han.</i>			OVAL.
		*pernodosus. <i>Lea.</i>			*semigranosus. <i>Phil.</i>
*irroratus. <i>Lea. Sh. &amp; Eat. Desh.</i>	<i>Unio explicatus. More.</i>				
<i>Han. Chenu.</i>	<i>Unio corium. Reeve.</i>				
<i>Unio verrucosus albus. Hild.</i>	*Leaii. <i>Gray. Benson.<sup>3</sup></i>				
<i>Unio stegarius. Con.</i>	<i>Unio nodulosus. Reeve.</i>				
*caperatus. <i>Lea.</i>	WIDE.				
<i>Unio abacoides. Hald.</i>	granosus. <i>Brug. Lam. Chenu. Han.</i>				
*dromas. <i>Lea. Han.</i>	<i>Iridea granosa. Swain.</i>				
*Aberti. <i>Con.</i>	*tuberculatus. <i>Bar. Sh. &amp; Eat. Hild.</i>				
<i>Unio Lamarekianus. Lea.</i>	<i>Adams. Chenu. Han.</i>				
	<i>Unio pustulata. Swain.</i>				
	<i>Mya tuberculata. Eat.</i>				

<sup>1</sup> 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." These remarks do not apply to *varicosus*, but they do to *Æsopus*, Green. I have always deemed it a rare shell.

<sup>2</sup> Küster figures (3) a male *perplexus* (nobis) as *gibbosus*, Raf. If his fig. 4 be taken from Mr. Conrad's *Monog.*, pl. 27, fig. 2, it is a *sulcatus*, Lea.

<sup>3</sup> Dr. Cantor, in the *Annals of Nat. Hist.*, vol. 9, p. 489, gives the habitat of this species in Chusan and in Canton River. He also describes a *Unio*, under the name of *divergens*, being "tuberculato-plicata;" also, an *Anodonta* (gibbum), both from Chusan. Mr. Benson, in *Journal Asiatic Soc.*, 1855, says that *divergens* is distantly related to *undulatus*, Bar.



NON-SYMPHYNOTE UNIONES.	NODULOUS.	WIDE.	<i>Novæ Hollandiæ. Gray. Han.</i>	NON-SYMPHYNOTE UNIONES.	SULCATE.	TRIANGULAR.	<i>*Nicaraguensis.<sup>4</sup> Lea.</i>
		<i>*eylindricus. Say. Sh. &amp; Eat. Hild. Han. Swain. Chenu. Unio naviformis. Lam. Blain. Valen. Desh.<sup>1</sup> Mya cylindrica. Eat.</i>	OVAL.			<i>*stramineus. Con. Han.</i>	
		SPINOS.	TRIANGULAR.			<i>*spinosus. Lea. Chenu. Han. Canthyria spinosa. Swain.</i>	<i>*Gerhardtii. Lea.</i>
			<i>*collinus. Con.</i>			<i>*aratus. Lea.</i>	
	NON-SYMPHYNOTE UNIONES.	SULCATE.	QUADRATE.			<i>*Wymanii.<sup>2</sup> Lea. Aveia. Ben.</i>	<i>*Dysonii. Lea.</i>
			TRIANGULAR.			<i>*Kraussii.<sup>3</sup> Lea. Castalia sulcata. Krauss.</i>	<i>*Caldwellii. Lea.</i>
		SULCATE.	<i>*rubidus. Lea.</i>			<i>*tripartitus. Lea.</i>	
			<i>*negatus. Lea.</i>			<i>*Rowellii. Lea.</i>	
			<i>*Averyi. Lea.</i>			<i>melleus. Lea.</i>	
			<i>*encarpus. Lea.</i>			<i>*Paramattensis. Lea.</i>	
<i>*Gabbianus. Lea.</i>			<i>*effulgens. Lea.</i>				
<i>*Granadensis. Lea.</i>			<i>*vittatus. Lea.</i>				
<i>*Estabrookianus. Lea.</i>			<i>*Syriacus. Lea.</i>				
<i>Unio striatissimus. Anth.</i>			OBLONG.	<i>*Scamnatu.<sup>5</sup> More. Unio Grundlachi. Dunk.</i>			

<sup>1</sup> Deshayes, in *Encly. Meth. Vers.*, tom. ii. p. 580, No. 5.

<sup>2</sup> Von Martens considers *Wymanii* to be a synonym to *delodontus*, Lam.; but, on a re-examination of the specimens, I am surprised at his conclusion.

<sup>3</sup> Dr. Dunker, at Cassel, gave me a shell under the name of *Castalia sulcata* Krauss, from Surinam. But it is not a *Prisodon* (*Castalia*); for, although it has the outline and general appearance, the teeth are not striate, but granulate. It therefore belongs to the triangular *Uniones*, and the name of *Unio sulcata* being preoccupied it must be changed, which I do to that of the able discoverer, Prof. Krauss—*Unio Kraussii*. This species has remarkable transverse furrows like some of the species of *Cyrena*.

<sup>4</sup> Lake Nicaragua, C. A.

<sup>5</sup> This very distinct and interesting species is from Cacajagicara River and Taco-taco River, Cuba. It is covered with transverse furrows.

NON-SYMPHYNOTE UNIONES.	SULCATE.	OBLONG.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	TRIANGULAR.
		*Shuttleworthii. <i>Lea.</i>			<i>Unio formosus</i> . <sup>2</sup> <i>Lea.</i> (Male.) <i>Chenu.</i>
		<i>Demararaensis. Lea.</i>			<i>Unio cuneatus. Swain.</i>
		<i>persulcatus. Lea.</i>			<i>Mya triangularis. Eat.</i>
	*Verreauxianus. <i>Lea.</i>	*Waccamawensis. <i>Lea.</i>			
	SUBROTUND.	*Foremanianus. <i>Lea. Chenu.</i>			
	*Newcombianus. <i>Lea.</i>	<i>Unio velatus. Con.</i>			
	<i>Unio sagrinatus. Sow.</i>	*Woodwardianus. <i>Lea.</i>			
	QUADRATE.	*trinaerus. <i>Lea.</i>			
	*arcæformis. <i>Lea. Desh. Chenu. Han.</i>	*compactus. <i>Lea.</i>			
<i>Unio nexus</i> . <sup>1</sup> <i>Say.</i>	*elegans. <sup>3</sup> <i>Lea. Chenu. Han.</i>				
<i>Leibii. Lea.</i>	<i>Unio truncatus. Say.</i>				
*tesserulæ. <i>Lea.</i>	*donaciformis. <sup>4</sup> <i>Lea. Desh. Chenu.</i>				
<i>quadrans. Lea.</i>	<i>Han.</i>				
*Berlandierii. <i>Lea.</i>	*zigzag. <i>Lea. Sh. &amp; Eat. Desh.</i>				
TRIANGULAR.	<i>Chenu. Han.</i>				
*triangularis. <i>Bar. Sh. &amp; Eat. Hild.</i>	*heterodon. <sup>5</sup> <i>Lea. Con. Desh. Lins.</i>				
<i>Say. Han.</i>	<i>Han.</i>				
	*penitus. <sup>6</sup> <i>Con.</i>				

<sup>1</sup> 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.

<sup>2</sup> Mr. Barnes's description of *triangularis* was made from a female shell, and mine of *formosus* from the male. There being an obvious distinction of the sexes in every specimen, my error was a very natural one, as we were not at the time acquainted with the sexual differences in the *Naiades*.

<sup>3</sup> 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 elicit his remarks had it been under his eyes.

<sup>4</sup> I have expressed my doubts, *Transactions of the American Philosophical Society*, vol. iv. p. 84 (p. 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 *neruosus*, Raf., and Mr. Conrad as *truncata*, Raf. Prof. Kirtland thinks this may be the female of *zigzag*. I am disposed to think that *zigzag* should be considered only a variety. If the soft parts prove to be the same, then certainly *zigzag* is a variety of *donaciformis*.

<sup>5</sup> Mr. Conrad describes a *Unio* (*Am. Jl. Sc.*, v. 21, Sec. Ser., p. 172) under the name of *diversus*, from Shoal Creek, North Alabama, which, he says, is remarkably like *heterodon* in form and teeth.

<sup>6</sup> 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.

## TRIANGULAR.

- \*compressissimus. *Lea.*
- \*securis. *Lea. Sh. & Eat. Desh. Chenu. Han.*  
*Unio depressa?*<sup>1</sup> *Raf.*; but not of *Lam.*  
*Unio lineolatus. Say.*
- \*abacus. *Hall.*
- \*camelus.<sup>2</sup> *Lea. Han.*
- \*ovatus. *Say. Lam. Bar. Valen. Sh. & Eat. Hild. Con. Küst. Han.*  
*Unio ventricosus. Desh.*  
*Unio subovatus. Desh.*  
*Unio occidens. Desh.*  
*Mya ovata. Eat.*  
*Æglia ovata. Swain.*
- \*dorsatus. *Lea.*
- \*excavatus. *Lea. Chenu.*
- \*perradiatus. *Lea.*
- \*Canadensis. *Lea.*
- involutus. *Bens. Blan.*
- \*satur. *Lea. Chenu.*
- \*subovatus.<sup>3</sup> *Lea. Chenu. Han.*
- \*crassidens.<sup>4</sup> *Lam. Chenu. Han.*

## TRIANGULAR.

- Unio cuneatus. Bar. Sh. & Eat. Hild.*  
*Unio niger? Raf.*  
*Unio niger. Con. Küst.*  
*Mya cuneata. Eat.*
- \*incrassatus. *Lea.*
- \*corvus. *Lea.*
- \*macrodon. *Lea.*
- \*Forbesianus. *Lea.*
- \*gibber. *Lea. Chenu. Han.*
- lanifer. *Bourg.*
- \*pumilus. *Lea. Chenu. Han.*
- Orbignyi. *Déville and Hupé.*
- \*rubiginosus. *Lea. Desh. Chenu. Han.*  
*Unio flavus. Con. Küst.*  
*Unio cerinus. Con. Küst.*  
*Cunicula rubiginosa. Swain.*
- jaspideus (Mono.) *Hupé.*<sup>5</sup>
- \*striatulus. *Lea.*
- \*pudicus. *Lea.*
- \*aureus. *Lea.*
- \*amabilis. *Lea.*

<sup>1</sup> 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!!

<sup>2</sup> I am much disposed to think this a variety of *phaseolus*, Hild. Dr. Kirtland considers it such in his Ohio Reports.

<sup>3</sup> 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.

<sup>4</sup> *Crassidens*, Var. *a*, Lam., is *trapezoides* (nobis).

<sup>5</sup> M. Hupé says it is *Alasmodonta*, but I suspect it to be *Monocondylea*.

NON-SYMPHYNOTE UNIONES. SMOOTH.	TRIANGULAR.	NON-SYMPHYNOTE UNIONES. SMOOTH.	TRIANGULAR.
	habetatus. <i>Con.</i>		*Riddellii. <i>Lea.</i>
	*succissus. <i>Lea.</i>		*Chunii. <i>Lea.</i>
	*glandaceus. <i>Lea.</i>		*irrasus. <i>Lea.</i>
	*Bigbyensis. <i>Lea. Chenu.</i>		*Rajahensis. <i>Lea. Chenu. Blan.</i>
	*favosus. <i>Lea.</i>		*favidens. <i>Ben. Blan.</i>
	*maculatus. <sup>1</sup> <i>Con.</i>		*stabilis. <i>Lea.</i>
	*Barnesianus. <i>Lea. Chenu. Han.</i>		*instructus. <i>Lea.</i>
	*verus. <i>Lea.</i>		Nagpoorensis. <i>Lea. Blan.</i>
	*cuneolus. <i>Lea. Chenu.</i>		cyrenoides. <i>Phili.</i>
	*Clinchensis. <i>Lea.</i>		*Holstonensis. <i>Lea. Chenu.</i>
	*personatus. <i>Say.</i>		*tumescens. <i>Lea.</i>
	<i>Unio pileus. Lea. Han.</i>		*fulgidus. <i>Lea.</i>
	<i>Unio capillaris. Lea. (female.)</i>		*Hartmanianus. <i>Lea.</i>
	*Stewardsonii. <i>Lea.</i>		*Taitianus. <i>Lea.</i>
	*biemarginatus. <i>Lea.</i>		*solidus. <i>Lea. Chenu. Han.</i>
	*Sowerbianus. <sup>2</sup> <i>Lea. Con. Küst. Han.</i>		*obliquus. <i>Lam. Menke. Han.</i>
	*Othealoogensis. <i>Lea.</i>		<i>Unio undatus. Bar. Will. Küst.</i>
	*trigonus. <i>Lea. Chenu. Han.</i>		<i>Unio trigonus.<sup>3</sup> Say. Con.; not of</i> <i>Lea.</i>

<sup>1</sup> Perfect specimens of *Unio Ravenelianus* (nobis) look so much like *maculatus*, that I am disposed to think, when many specimens of both are examined, they will prove to be the same species. *Ravenelianus* has precedence.

<sup>2</sup> See note on *Haysianus*, Lea, p. 41.

<sup>3</sup> 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 recognized as different species. The *trigonus* is always more angular on the umbonal 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 color of the animal in *trigonus* would at once settle the question. It is peculiar, being 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. There is not a doubt as to its being specifically different.

NON-SYMPHYNOTE UNIONES. SMOOTH.	TRIANGULAR.	NON-SYMPHYNOTE UNIONES. SMOOTH.	TRIANGULAR.
	<i>Unio mytiloides.</i> Sh. & Eat.		<i>Unioopsis mytiloides.</i> Swain.
	<i>Unio undulatus.</i> Desh.		OBLIQUE.
	<i>Unio cordatus?</i> Raf.		*Troostii. Lea. Han.
	<i>Unio cordatus.</i> Con. Küst.		<i>Unio trabalis.</i> Con.
	<i>Unio caridiacea.</i> Guérin.		*trossulus. Lea.
	<i>Mya undata.</i> Eat.		lepidus. Gould.
	*plenus. Lea.		*Tigris. Fer.
	*pyramidatus. Lea. Küst. Chenu.		<i>Unio Tigridis.</i> Bourg.
	Desh. Han.		*Pazii. Lea.
	<i>Unio rubra?</i> Raf.		*terminalis. <sup>2</sup> Bourg. Mouss. Trist.
	<i>Unio mytiloides.</i> Con.		*tumidulus. Lea.
	<i>Unio caridiacea.</i> Desh.		cor. Con. Han.
	*Bournianus. Lea. Chenu.		truncatus. Swain. Han.
	*Edgarianus. Lea. Chenu.		*Bourguignatianus. Lea.
*Mooresianus. Lea.	*dignatus. Lea.		
*mytiloides. <sup>1</sup> Raf. Swain; not of Desh.			
<i>Unio triangularis.</i> Con.			
<i>Unio rubra.</i> Con.			
<i>Unio caridiacea.</i> Con.			
<i>Mya obliqua.</i> Wood.			

<sup>1</sup> It is a matter of great doubt if this name ought to be admitted at all in this table. It was applied, many years since, by the naturalists of this city, without reference to any particular specimen, but, as it now appears nearly certain, incorrectly. Dr. Ward says the description and outline would "equally well apply to six or eight different species." The difficulty of recognizing Mr. Rafinesque's species is well illustrated in this one. Mr. Conrad, in *New Fresh Water Shells U. S.*, considers *triangularis*, Raf., as the type, and gives the following names of the same author as synonyms, viz., *lateralis*, *sintoria*, *paehostea*, *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 SUB-FAMILIES!!** 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)! Deshayes described a different shell under the name of *mytiloides*. (*Ency. Meth.*, p. 249, Fig. 4.) I doubt from this figure if it be not a *complanatus*. We certainly have in our rivers, occasionally, specimens of this protean species very closely resembling this figure. M. Deshayes's figure has some resemblance to an imperfect *Batavus*. The habitat is not known. The confusion is increased by Mr. Conrad's subsequent attempt at correction. In *Monography*, 1836, he makes *mytiloides* a type, and puts *rubra*, Raf., *pyramidatus*, Lea, and *caridiacea*, Guérin, as synonyms. Subsequently, in *Synopsis* of 1853, *mytiloides* and *triangularis* are both dismissed as types, and the former made synonym to *clava*, Lam., while the latter is made synonym to *triqueter*, Raf.!!

<sup>2</sup> Mr. Tristram, in *Proc. Zool. Soc.* 1865, p. 543, says he thinks that *terminalis* and *Jordanicus*, Bourg. are the same, and that *dignatus* (nobis) seems to him to be identical with *terminalis*, but I doubt it.

NON-SYMPHYNOTE UNIONES. SMOOTH.	OBLIQUE.	NON-SYMPHYNOTE UNIONES. SMOOTH.	OBLIQUE.
	*bulbosus. <i>Lea.</i>		*Murrayensis. <i>Lea.</i>
	*Hanleyianus. <i>Lea.</i>		*oviformis. <i>Con.</i>
	*flavidulus. <i>Lea.</i>		*argenteus. <i>Lea. Chenu.</i>
	*pallidofulvus. <i>Lea.</i>		*pyriformis. <i>Lea.</i>
	*interventus. <i>Lea.</i>		*castus. <i>Lea.</i>
	*decisus. <i>Lea. Con. Küst. Chenu. Han.</i>		*Ravenclianus. <i>Lea. Han. Unio rudis. Con.</i>
	*crebrivittatus. <i>Lea.</i>		ravistellus. <i>More.</i>
	*consanguineus. <i>Lea.</i>		*modicus. <i>Lea.</i>
	*Chattanoogaensis. <i>Lea.</i>		*Troschelianus. <i>Lea.</i>
	*anaticulus. <i>Lea. Reeve.<sup>1</sup></i>		*medius. <i>Lea.</i>
	*curtus. <i>Lea.</i>		*striatus. <i>Lea.</i>
	*clavus. <i>Lam. Con. Menke. Küst. Han. Unio scalenia. Raf. Unio modioliformis. Say; not of Lea.</i>		*Rangianus. <sup>2</sup> <i>Lea. Chenu. Han. Unio gibbosus. Küst. (Pl. 4, Fig. 4.)</i>
	*patulus. <i>Lea. Con. Desh. Chenu. Han.</i>		*Sampsonii. <i>Lea.</i>
	*Lesleyi. <i>Lea.</i>		*sulcatus. <i>Lea. Sh. &amp; Eat. Say. Desh. Chenu. Swain. Han. Unio ridibundus. Say. Sh. &amp; Eat. (Female.)<sup>3</sup> Unio pectitus.<sup>4</sup> Con. Jl. A. N. S., vol. 2, p. 297.)</i>
	*mundus. <i>Lea.</i>		

<sup>1</sup> I doubt if the figure of Reeve (199) be made from a true *anaticulus*.

<sup>2</sup> This species has been supposed by some naturalists to be the same with *perplexus* (nobis). Mr. Clark, of Cincinnati, informs me that the animal differs in color, being lighter. It is known there vulgarly as the "White Mouth." They are certainly distinct species.

<sup>3</sup> For some years, I was satisfied that Mr. Say's *ridibundus* was only a variety of *sulcatus* (nobis). There cannot now, however, be a doubt that it is the female of that species; and it may be remarked that this serrated shell is usually found smaller than the other; a circumstance common with the females of some 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.

<sup>4</sup> Mr. Conrad described and figured a male and female shell from the Wabash under this name. There is no doubt in my mind of their being the same with *sulcatus*, Lea (male), and *ridibundus*, Say (female). Mr. C. thinks this species has some analogy to *lenior*, Lea, but it has not the same outline, and differs in other characters. He thinks the males have been "confounded with that of *torulosus*, Raf.;" but what is *torulosus*, Raf.? Mr. C. considers it, in his *Synonymy*, the same with *perplexus*, Lea. Mr. Say, however, discards *torulosus*, Raf., and considers *perplexus*, Lea, as a synonym to *gibbosus*, Raf. Mr. C.'s figure of *metastriatum* is much more like *lenior*, Lea.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OBLIQUE.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.
		<i>Unio gibbosus.</i> Con.			<i>Thwaitesii.</i> Lea. Blan.
		<i>Unio perobliquus.</i> Con.			* <i>Lecontianus.</i> Lea. Chenu. Han. <i>Unio contrarius.</i> Con.
		* <i>Haysianus.</i> <sup>1</sup> Lea. Han.			* <i>spissus.</i> Lea.
		* <i>ellipsis.</i> <sup>2</sup> Lea. Say. Sh. & Eat. Potier. Chenu. Han. <i>Unio brevisialis?</i> Sow.			* <i>Downiei.</i> Lea.
		* <i>crapulus.</i> Lea.			* <i>Satillaensis.</i> Lea.
		* <i>Higginsii.</i> Lea.			* <i>geminus.</i> Lea.
		* <i>castaneus.</i> Lea. Chenu. Han.			* <i>perdix.</i> Lea. Han. <i>Unio pectorosus.</i> Con. Küst.
		* <i>Johannis.</i> Lea.			* <i>ventricosus.</i> Bar. Adams. DeKay. Han. <i>Unio radiatus.</i> Hill. <i>Lampsilis ventricosa.</i> Stimp. (Agass. MSS.) <i>Mya ventricosa.</i> Eat.
		* <i>Genthi.</i> Lea.			* <i>occidens.</i> <sup>3</sup> Lea. Sh. & Eat. Han. <i>Unio ventricosus.</i> Say. <i>Unio lenis</i> (junior). Con. <i>Unio cardium.</i> Con.
		* <i>pulvinulus.</i> Lea.			* <i>lineatus.</i> Lea. Chenu.
		* <i>modicellus.</i> Lea.			* <i>dolabraformis.</i> Lea. Chenu. Han.
		* <i>Arkansasensis.</i> Lea.			
		OVAL.			
		* <i>Tampicoensis.</i> Lea. Chenu. Han.			
		* <i>Coloradoensis.</i> Lea.			
		* <i>umbrosus.</i> Lea.			
		* <i>porphyreus.</i> Lea.			

<sup>1</sup> I am very much disposed to think that *Haysianus* will prove to be the female of *Sowerbianus* (nobis). They differ much in size, but in other characters are much alike, except in the female enlargement. The latter is the larger, and has never, so far as I know, been found with charged branchial uteri. The former usually has them charged, I am informed.

<sup>2</sup> 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.

<sup>3</sup> 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. Dr. Ward thinks they are male and female. 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. Prof. Kirtland, in *Ohio Reports*, says it is impossible, with our present knowledge, to draw lines of specific distinction between the group consisting of *ovalus*, *ventricosus*, *occidens*, *subovatus*, &c.

NON-SYMPHYNOTE UNIONES.

SMOOTH.

## OVAL.

- \*capax.<sup>1</sup> *Green. Con. Küst.*  
*Sym. globosa. Lea.*  
*Unio ventricosus. Reeve.*
- \*splendidus. *Lea. Han.*
- \*ochraceus. *Say. Con. Gould. Linsley. Dekay. Migh. Potier. Han.*  
*Sym. ochracea. Lea.*  
*Unio rosaceus. Con.*  
*Lampsilis ochracea. Stimpson. (Agass. MSS.)*  
*Mya ochracea. Eat.*
- \*delicatus. *Lea.*
- stagnalis. *Con.*  
*Unio Ogecheensis. Con.*
- \*Clarkianus. *Lea.*
- \*crocatus. *Lea. Chenu.*
- \*Cambodiensis. *Lea.*
- \*affinis. *Lea.*
- Mauritianus. *Lea.*
- \*cariosus. *Say. Bar. Gould. Linsley. Dekay. Potier. Sh. & Eat. Han.*  
*Unio cariosa.<sup>2</sup> Lam.*  
*Unio ovata. Valen.*  
*Unio luteola. Con.; not of Lam.*  
*Unio oratus. Con.*  
*Lampsilis cariosa. Stimpson. (Agass. MSS.)*  
*Mya cariosa. Eat.*

NON-SYMPHYNOTE UNIONES.

SMOOTH.

## OVAL.

- \*Spillmanii. *Lea.*
- \*fascinans. *Lea.*
- \*vivescens. *Lea.*
- \*Georgianus. *Lea. Chenu.*
- perovatus. *Con. Han.*
- \*altilis. *Con. Han.*
- callosus. *Lea.*
- \*multiradiatus. *Lea. Desh. Chenu. Han.*  
*Unio fasciola? Raf.*  
*Unio fasciolus. Con. Küst.*  
*Unio ligamentina. Desh.*
- \*doliaris. *Lea.*
- saxeus. *Con.*
- perovalis. *Con. Han.*
- \*capsæformis. *Lea. Con. Han.*
- \*deviatus. *Anthony.*
- \*turdigulus. *Lea.*
- \*Florentinus. *Lea.*  
*Unio sacculus. Anth.*
- \*Greenii.<sup>3</sup> *Han. Con.*
- \*simplex. *Lea.*

<sup>1</sup> Mr. Say considers *capax* as a variety of *cardium*, Raf., of *ventricosus*, Bar., of *occidens*, Lea, and *subovatus*, Lea, while Mr. Conrad considers it as *occidens*, Lea. *Capax* is a perfectly distinct species, and I had considered it so for some years before either Dr. Green or I described it. He preceded me a short time, of which I was not aware, as it was published in an unusual periodical for such matter.

<sup>2</sup> *U. cariosa*, Lam. (Var. 2), is the *Alas. marginata*, Say.

<sup>3</sup> The description and figure in Mr. Conrad's *Monograph* differ from those in his *New Fr. Wat. Shells*.



NON-SYMPHYNOTE UNIONES. SMOOTH.	OVAL.	NON-SYMPHYNOTE UNIONES. SMOOTH.	OVAL.
	*flavescens. <sup>1</sup> <i>Lea.</i>		*Rutersvillensis. <i>Lea.</i>
	*pictus. <i>Lea. Han.</i>		*Topekaensis. <i>Lea.</i>
	*fucatus. <i>Lea.</i>		*planico <sup>4</sup> status. <i>Lea.</i>
	*pallescens. <i>Lea.</i>		*spatulatus. <i>Lea.</i>
	*perpastus. <i>Lea.</i>		*Anthonyi. <i>Lea.</i>
	Mortonicus. <i>Reeve.</i>		*ligamentinus. <i>Lam.</i> <sup>3</sup> <i>Küst.</i> <i>Unio crassus. Say. Bar.</i> <sup>4</sup> <i>Hill.</i> <i>Kirtl. Han.</i>
	*Tennesseensis. <i>Lea. Chenu.</i>		<i>Unio ellipticus. Bar. Hill.</i> <i>Unio carinatus. Bar.</i> <i>Mya elliptica. Eat.</i> <i>Mya carinata. Eat.</i> <i>Mya crassa. Eat.</i> <i>Mya gravis. Wood.</i> <i>Unio fasciatus. Con.</i> <sup>5</sup> <i>Küst.</i>
	*interruptus. <i>Lea. Chenu. Han.</i> <i>Unio tæniatus. Con. Han.</i> <i>Unio latiradiatus. Con.</i>		*exactus. <i>Lea.</i>
	*Menkianus. <sup>2</sup> <i>Lea. Chenu. Han.</i>		*purus. <i>Lea.</i>
	*bracteatus. <i>Gould.</i>		*cognatus. <i>Lea.</i>
	*Lindsleyi. <i>Lea.</i>		*Plantii. <i>Lea.</i>
	*punctatus. <i>Lea.</i>		*orbiculatus. <i>Hill. Kirtl. Han.</i> <i>Unio abruptus.</i> <sup>6</sup> <i>Say. Desh.</i> <i>Unio crassus. Con.</i>
	*Stonensis. <i>Lea.</i>		
	*venustus. <i>Lea. Chenu.</i>		
	*exiguus. <i>Lea. Chenu. Han.</i>		

<sup>1</sup> This may be a variety of *Greenii*, *Lea.*

<sup>2</sup> Koch and Dunker described a fossil species (*Menkei*) in 1837: *Beiträge zur Kenntniss*, p. 58. My species was described in the *Trans. Am. Phil. Soc.* 1836, and must therefore have precedence.

<sup>3</sup> Having recently had access to Retzius's work (1788), I find that he described a European *Unio* under the name of *crassus*, which species had been admitted into our systems under the name of *crassissimus*, *Fer.*, I now restore it to its proper place under the name of *crassus*. Mr. Say described his *crassus* as having "waves;" but his figure, inside view only, certainly is a species without "waves."

*Deshayes* thinks that *U. ligamentinus* is analogous to *U. multiradiatus*, and probably a young individual of it. This is not likely to be the case, however. The species are very different.

<sup>4</sup> Mr. Barnes made eleven varieties of *crassus*; most of which were, no doubt, distinct species; some were plicate.

<sup>5</sup> Mr. Conrad thinks the *crassus* of *Say* is *fasciata* of *Rafinesque*. An 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*.

<sup>6</sup> The specimen figured by *Say*, in *Amer. Conch.* No. 2, is a female shell. The male shell is not abrupt at the posterior margin.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	<p>           OVAL.            *pinguis. <i>Lea.</i>    <i>Australis.</i> <i>Lam. Phil.<sup>1</sup> Desh. Han.</i>  <i>Hyridella Australis.</i> <i>Swain.</i>              *Hydianus. <i>Lea. Chenu. Adams. Han.</i>              *approximus. <i>Lea.</i>              *Aztecorum. <i>Phil.</i>              *Claibornensis. <i>Lea. Chenu. Han.</i>              *Powellii. <i>Lea.</i>              *Reeveianus. <i>Lea.</i>              *luteolus. <i>Lam. Dekay. Han.</i>  <i>Unio siliquoides.</i><sup>2</sup> <i>Bar. Con. Adams.</i>  <i>Küst.</i>  <i>Unio inflatus.</i> <i>Bar.</i><sup>3</sup>  <i>Unio melinus.</i> <i>Con.</i>  <i>Unio rosaceus.</i> <i>Dekay.</i>  <i>Lampsilis siliquoides.</i><sup>4</sup> <i>Stimp. (Agass.</i>  <i>MSS.)</i>  <i>Mya inflata.</i> <i>Eat.</i>  <i>Mya siliquoides.</i> <i>Eat.</i>    <i>Childreni.</i><sup>5</sup> <i>Gray.</i>    <i>pulcher.</i> <i>Lea. Chenu. Han.</i> </p>	NON-SYMPHYNOTE UNIONES.	SMOOTH.	<p>           OVAL.            *tener. <i>Lea. Chenu.</i>              *Prevostianus. <i>Lea.</i>              *modioliformis. <i>Lea. Han.</i>              *tenerus. <i>Rav. Han.</i>              *perpictus. <i>Lea.</i>              *radiatus. <i>Lam. Bar. Desh. (Ency.</i>  <i>Ver. T. 2.) Menke. Gould. Lins-</i>  <i>ley. Migh. Dekay. Küst. Han.</i>  <i>Unio Virginiana.</i> <i>Lam. Menke.</i>  <i>Unio obliquiradiatus.</i> <i>Reeve.</i>  <i>Unio radiatus.</i><sup>6</sup> <i>Speng.</i>  <i>Unio distans.</i> <i>Anth.</i>  <i>Mya radiata.</i> <i>Gmel. Wood. Dill.</i>  <i>Schreib. Eat.</i>  <i>Mya oblongata.</i> <i>Wood.</i>  <i>Mya pictorum tenuis.</i> <i>Chem.</i>  <i>Lampsilis radiata.</i> <i>Stimpson. (Agass.</i>  <i>MSS.)</i>    <i>Jordanicus.</i> <i>Bourg. Mous.</i>  <i>Unio Grelloisianus.</i> <i>Bourg.</i>              *apicinus. <i>Lea.</i>    <i>Gontierii.</i> <i>Bourg.</i>              *Bruguierianus. <i>Bourg.</i> </p>
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<sup>1</sup> Dr. Philippi figures a *Unio* under the name of *Australis*, Lam. (*Conchylien*, Tab. 5, Fig. 5), from New Holland, and says that *U. ambiguus*, Parreyss, is the young. I did not see Lamarek's *Australis*, when in Paris; it was not in the Museum.

<sup>2</sup> Mr. Say makes *siliquoides* 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*.

<sup>3</sup> Described from a female *luteolus*, Lam.

<sup>4</sup> Prof. Agassiz says, in MSS. cited by Mr. Stimpson, that this is not identical with the Ohio River species usually called *U. siliquoides*; but I think they are the same.

<sup>5</sup> 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. In the index, Mr. Gray inserts, in brackets (*Unio Chinensis*), and says it has small compressed teeth. The figure looks something like a *Monocondylaea*, D'Orbigny.

<sup>6</sup> Spengler, in *Skriv. Nat. Hist.*, v. 3, cites *radiatus* from Müller, and as coming from the East Indies. If from that part of the globe, it cannot belong to this species.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL. <i>Unio orientalis.</i> Bourg. *regularis. Lea. Chenu. *Paraguayensis. Lea. Swinhoci. H. Adams. Reeve. *amœnus. Lea. Chenu. *Sapotalsensis. Lea. Chenu. *Oregonensis. Lea. *Medellinus. <sup>1</sup> Lea. Chenu. Han. *notatus. Lea. Chenu. Han. *micans. Lea. *perlucens. Lea. *subangulatus. Lea. *sparus. Lea. *Veracruzensis. Lea. *scitululus. Lea. *Goascoranensis. Lea. *gracilior. Lea. *obfuscus. Lea. *rutilans. Lea. *subellipsis. Lea. *datus. Lea.
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NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL. <i>Aucklandicus.</i> Gray. *dispar. Lea. *concestator. Lea. *licnosus. <sup>2</sup> Con. Küst. Han. *calliginosus. Lea. *firmus. Lea. *Nashvillensis. <sup>2</sup> Lea. Han. *contiguus. Lea. *umbrans. Lea. *intercedens. Lea. *fallax. Lea. *obscurus. Lea. *genuinus. Lea. *Zieglerianus. Lea. Chenu. Han. *proximus. Lea. *nitens. Lea. *Copei. Lea. *Pybasii. Lea. *proprius. Lea. *tenebricus. Lea. *Prattii. Lea.
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<sup>1</sup> Mr. Say's *purpuratus* and this may be the same. I have never seen his specimens, and there is no figure. The description is in the *Disseminator*, Jan. 1, 1831.

<sup>2</sup> Mr. Conrad, in his *Monograph of Unionidæ*, p. 61, considers *Nashvillensis*, Lea, to be the same with *licnosus*, Con.; but the former shell is certainly not the species figured by him pl. 34, f. 2.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.	SMOOTH.	OVAL.
		*Vanuxemii. <i>Lea. Chenu.</i>		Fellmani. <i>Desh.</i>
		*constrictus. <i>Con.</i>		*Binneyi. <i>Lea.</i>
		*placitus. <i>Lea.</i>		*utriculus. <i>Lea.</i>
		*buxeus. <i>Lea.</i>		*lamellatus. <sup>1</sup> <i>Lea. Chenu. Blan.</i>
		*concavus. <i>Lea.</i>		curatus. <i>Lea.</i>
		*sudus. <i>Lea.</i>		*viridiradiatus. <i>Lea.</i>
		*radians. <i>Lea.</i>		*consobrinus. <i>Lea.</i>
		*difficilis. <i>Lea.</i>		Layardii. <i>Blan.</i>
		puniccus. <i>Hald.</i>		*Menzienu. <sup>2</sup> <i>Gray.</i>
		*Gouldii. <i>Lea.</i>		Keraudreni. <i>Eyd. Blan.</i>
		*delodontus. <i>Lam. Chenu. Hupé. Han.</i>		*Ferussacianus. <i>Lea.</i>
		<i>Unio lacteolus. Lea. D'Orb.</i>		*Delesserti. <i>Bourg.</i>
		*piger. <i>Lea.</i>		eucirrus. <i>Bourg.</i>
		*fabaceus. <i>Lea.</i>		Bagdadensis. <i>Bourg.</i>
		*Uruguayensis. <i>Lea.</i>		*Vescoi. <i>Bourg.</i>
		*apprimus. <i>Lea.</i>		<i>Unio Swerzenbackii. Bourg.</i>
		*Moussonianus. <i>Lea.</i>		versus. <i>Lea.</i>
		luteus. <i>Lea. Blan.</i>		<i>Unio inornatus.<sup>3</sup> Han. Reeve.</i>
		*Monroensis. <i>Lea.</i>		*contradens. <i>Lea. Han.</i>
	<i>Unio Javanus. Lea. Chenu.</i>			
	<i>Unio exilis.? Dunk.</i>			
	<i>Unio mutatus. Mouss.</i>			

<sup>1</sup> Blanford considers this a variety of *marginalis*, but they are certainly distinct. I have some from Madras, and I doubt if Mr. B. has ever seen the species.

<sup>2</sup> This remarkably compressed species was given to me by Mr. McAndrews, of Liverpool, under this name. I am not aware where Mr. Gray has described it.

<sup>3</sup> *Inornatus* being preoccupied by me, I change this to *versus*, not being able to call it after Mr. Hanley or Mr. Reeve, both names being preoccupied by me.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.
		* <i>Bengalensis</i> . <i>Lea</i> . <i>Chenu</i> . <i>Blan</i> . <sup>1</sup> <i>Han</i> .			* <i>Batavus</i> . <i>Mat. and Ract. Lam. Nils.</i> <i>Pfeif. Rossm. Flem. Stein. Bouch.</i> <i>Puton. Potier. Dup. Brown.</i> <i>Desh. Menke. Mor. Goupil.</i> <i>Waard. Chenu. Fitz. Gras.</i> <i>Grat. Siemasc. Gerst. Brot.</i> <i>Moq.</i>
		<i>An. purpurea</i> . <i>Valen.</i>			<i>Mya pictorum</i> . <i>Chem. Schröeter.</i> <i>Monta.</i>
		<i>An. Chinensis</i> . <i>Küst</i> . <sup>2</sup>			<i>Mya ovalis</i> . <sup>4</sup> <i>Soland.</i>
		<i>Unio verecundus</i> . <i>Gould.</i>			<i>Mya Batava</i> . <i>Wood. Maton. Dill.</i> <i>Mysca Batava</i> . <i>Turton.</i>
		* <i>locellus</i> . <i>Lea.</i>			<i>Unio ater</i> . <i>Nils. Ross. Bourg. Maq.</i> <i>Unio riparia</i> . <i>Pfeif. Menke.</i>
		* <i>prunoides</i> . <i>Lea.</i>			<i>Unio pictorum</i> . <i>Drap.</i> , Pl. 11, Fig. 3. <i>Unio fuscus</i> . <i>Zeigler. Mühl. Fitz.</i> <i>Unio gibba</i> . <i>Mühl. Pfeif.</i>
		* <i>peculiaris</i> . <i>Lea.</i>			<i>Unio Labacensis</i> . <i>Pfeif. Mühl.</i> <i>Schmidt.</i>
		* <i>evitatus</i> . <i>Lea.</i>			<i>Unio reniformis</i> . <i>Schmidt. Rossm.</i> <i>Potier.</i>
		* <i>pilatus</i> . <i>Lea.</i>			<i>Unio fuscus</i> . <i>Zeig. Pfeif.</i> <i>Unio consentaneus</i> . <i>Zeig. Rossm.</i> <i>Schmidt.</i>
		* <i>cæruleus</i> . <i>Lea. Ben. Chenu. Blan.</i> <i>Han.</i>			<i>Unio amnicus</i> . <i>Zeig. Rossm. Po-</i> <i>tier. Schmidt. Bourg.</i>
		<i>Unio Gerbidoni</i> . <i>Eyd. Blan.</i>			<i>Unio Carynthiacus</i> . <i>Zeig. Rossm.</i> <i>Potier. Schmidt.</i>
		* <i>inornatus</i> . <i>Lea.</i>			<i>Unio decurvatus</i> . <i>Rossm. Potier.</i> <i>Schmidt. Bourg.</i>
		* <i>parcus</i> . <i>Lea.</i>			<i>Unio sinuatus</i> . <i>Stud.</i> <i>Unio planus</i> . <i>Stud.</i> <i>Unio dilatatus</i> . <i>Stud.</i>
		<i>Wilsonii</i> . <i>Lea.</i>			<i>Unio Moquinianus</i> . <i>Dup. Merm.</i> <i>Rossm. Grat. Moq.</i>
		* <i>substriatus</i> . <i>Lea.</i>			<i>Unio atrovirens</i> . <i>Schmidt.</i>
		* <i>olivarius</i> . <i>Lea. Ben. Chenu. Blan</i> . <sup>3</sup> <i>Han.</i>			
		* <i>Nuttallianus</i> . <i>Lea. Blan.</i>			
		* <i>Gabonensis</i> . <i>Küst.</i>			

<sup>1</sup> Mr. Blanford says it is a very peculiar variety of *marginalis*, and on the same page, says it is nearer to *corrugatus* than to *marginalis*! Also that it probably is not Indian, but "has better claims to distinction than most of Lea's species." It is very difficult for me to understand how any one, even with a little experience, can confound this species with any other, it is so very different. I doubt if Mr. B. has ever seen the species. It is not from the Ganges, but from Manilla, from whence many specimens were brought by Com. Wilkes' Expedition.

<sup>2</sup> The figure by Küster has teeth, and cannot be an *Anodonta*. I think it must be the same as *Bengalensis*.

<sup>3</sup> Mr. Blanford doubts if this be not the same with *cæruleus*, but they are different without doubt.

<sup>4</sup> Fide Dillwyn.

NON-SYMPHYNOTE UNIONES.		NON-SYMPHYNOTE UNIONES.		
NON-SYMPHYNOTE UNIONES.	SMOOTH.	SMOOTH.	SMOOTH.	
	OVAL.	OVAL.	OVAL.	
		<i>Unio meridiger.</i> Walsh.	<i>*coruscus.</i> Gould.	
		<i>Unio argens.</i> Küst.	<i>*pygmæus.</i> Lea.	
		<i>Unio badius.</i> Kokeil. Schmidt.	<i>*pusillus.</i> Lea.	
		<i>Unio Kurrii.</i> Küster.	<i>*lucidus.</i> Lea.	
		<i>Unio Retzii.</i> Küster.	<i>*fuscatus.</i> Lea.	
		<i>Unio Nessorynchus.</i> Held.	<i>*perpurpureus.</i> Lea.	
		<i>Unio tristis.</i> Morelet.	<i>*occultus.</i> Lea.	
		<i>Unio piscinalis.</i> Zeig. Rossm.	<i>*spadiceus.</i> Lea.	
		<i>Unio rubens.</i> Menke. Rossm.	<i>*luridus.</i> Lea.	
		<i>Unio rugatus.</i> Menke. Rossm.	<i>*Cumberlandicus.</i> Lea. Chenu. Han.	
		<i>Unio Bandinii.</i> Küst. Rossm.	<i>*Jonesii.</i> Lea.	
		<i>Unio Hispanicus.</i> Moquin. Rossm.	<i>*linguæformis.</i> Lea.	
		<i>Graells.</i> Bourg.	<i>*Smithii.</i> <sup>4</sup> Gray.	
		<i>Unio Sandrii.</i> Villa. Rossm. Bourg.	<i>vibex.</i> Con. Han.	
		<i>Unio destructilis.</i> Villa.	<i>*Mühlfeldianus.</i> Lea. Chenu. Reeve. Han.	
		<i>Unio Moulinsianus.</i> Dup. Grat.	<i>*creperus.</i> Lea. Chenu. Han.	
		<i>Unio pruinosis.</i> Schmidt.	<i>*glaber.</i> Lea. Chenu. Han.	
		<i>Unio subdentatus.</i> Zieg. Rossm.	<i>*discrepans.</i> Lea.	
	<i>Unio vitreus.</i> Stenz.			
	<i>Unio Maccerthyanus.</i> Bourg.			
	<i>Unio Byzantinus.</i> Parr.			
	<i>Unio orientalis.</i> <sup>1</sup> Parr.			
	<i>*Mosulensis.</i> Lea.			
	<i>*Caffer.</i> Krauss.			
	<i>*Africanus.</i> Lea. <sup>2</sup>			
	<i>Duriei.</i> Desh.			
	<i>Ravoisieri.</i> Desh. <sup>3</sup>			
	<i>*Bucklyi.</i> Lea.			
	<i>Liebmanni.</i> Phil.			

<sup>1</sup> Very much the form of *M. Batavus*, Lam., and may prove to be the same. *Voy. de la Mer Morte*, par Sauley, 15th liv., p. 78.

<sup>2</sup> Prof. Krauss informs me that he thinks this is only the young of his *Caffer*. But not having seen each other's specimens, there remains at least a doubt of it.

<sup>3</sup> This and the previous species are very much like *Batavus*, and may prove only well-marked varieties. The species in Algeria seems to be very much the same with those of the opposite side of the Mediterranean in France and Spain. The land shells vary little in species, but the species are finer and larger in Algeria.

<sup>4</sup> 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.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.
		<p>*fabalis.<sup>1</sup> <i>Lea. Chenu. Han.</i>  <i>Unio capillus. Say, Transylvania</i>  <i>Journal, vol. v.</i>  <i>Unio lapillus. Say, Am. Conch. No.</i>  <i>5. Con.</i></p> <p>*paulus. <i>Lea. Chenu.</i></p> <p>*corvinus. <i>Lea.</i></p> <p>*Cromwellii. <i>Lea.</i></p> <p>*parvus. <i>Bar. Sh. &amp; Eat. Con. Phil.</i>  <i>Küst. Adams. Han.</i>  <i>Mya parva. Eat.</i></p> <p>*corvunculus. <i>Lea.</i></p> <p>*marginis. <i>Lea.</i></p> <p>*germanus. <i>Lea.</i></p> <p>*granulatus.<sup>2</sup> <i>Lea.</i></p> <p>*cylindrellus. <i>Lea.</i></p> <p>*Texasensis. <i>Lea.</i></p> <p>*Bairdianus. <i>Lea.</i></p>			<p>*Bealei. <i>Lea.</i></p> <p>*Haleianus. <i>Lea. Chenu.</i></p> <p>*nigerrimus. <i>Lea.</i></p> <p>*minor. <i>Lea.</i></p> <p>*glans.<sup>3</sup> <i>Lea. Küst. Chenu. Con.</i>  <i>Han.</i></p> <p><i>involutus. Hanley. Reeve.</i></p> <p>*nux. <i>Lea.</i></p> <p>*cinnamomicus. <i>Lea.</i></p> <p>*Brumbyanus. <i>Lea.</i></p> <p>*concolor. <i>Lea.</i></p> <p>*mcestus. <i>Lea. Chenu.</i></p> <p>*pullus. <i>Con.</i></p> <p>*divaricatus. <i>Lea. Von Mar. Han.</i></p> <p>*Petterianus? <i>Küst.</i><sup>4</sup>  <i>Unio carneus. Küst.</i></p>

<sup>1</sup> 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 (August, 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, were I to choose between the two.

<sup>2</sup> Probably a marked variety of *germanus*, Lea.

<sup>3</sup> 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 heavier shell, and the naere 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 color. The texture of the naere is also totally different, the latter being more pearly than any other of our *Uniones*. In the epidermis and beaks they also differ essentially. Mr. Conrad describes and figures *U. glans*, Lea, in Monog., p. 21; but the figure is evidently not *glans*. It is very like some of the varieties of *U. obscurus*, Lea.

<sup>4</sup> *U. Petterianus* and *U. carneus* were sent to me by Dr. Vandembusch, of Bremen, as distinct species. I believe the latter to be the old of the former, thrown out of its normal form by much erosion at the beaks. They are from Montenegro, and may prove to be only a variety of *Unio Batavus*. See Küster's edition of Martini, Pl. 26, Fig. 4.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	OVAL.
		*faba. <i>D'Orb. Han.</i>			corbis. <i>Benson.<sup>2</sup> Blan.</i>
		*ineptus. <i>Lea.</i>			*Egyptiacus. <i>Caill. Fer. Desh. Potier. H. Adams. Han.</i>
		*Wynegungaensis. <i>Lea. Blan.</i>			<i>Unio eucyphus. Boury.</i>
		*Burroughianus. <i>Lea. D'Orb. Hupé. Von Mart. Han.</i>			Guadechaudii. <i>Eyd. Blan.</i>
		*vestitus. <i>Lea.</i>			*Bonneaudii. <sup>3</sup> <i>Eyd. Blan.</i>
		*Wheatleyanus. <i>Lea.</i>			OBLONG.
		*rudus. <i>Lea.</i>			*brevidens. <i>Lea. Chenu. Han.</i>
		*Tecomatensis. <i>Lea.</i>			<i>Unio interruptus. Con.</i>
		*discus. <sup>1</sup> <i>Lea. Chenu. Han.</i>			*tetralasmus. <sup>4</sup> <i>Say. Desh. Con. Han.</i>
		<i>Unio Panacoensis. V. d. Busch. Phil.</i>			*trifidus. <i>Lea.</i>
		<i>Unio Mexicanus. Sow. Reeve.</i>			*camptodon. <sup>5</sup> <i>Say. Han.</i>
		*simus. <i>Lea. Chenu. Han.</i>			<i>Unio declivis.<sup>6</sup> Con.</i>
		*plancus. <i>Lea.</i>			<i>Unio Sayii. Tappan. Con.</i>
		multidentatus. <i>Phili.</i>			<i>Unio electrinus. Reeve.</i>
*Niloticus. <i>Caill. Fer. Desh. Han.</i>	<i>Unio rhomboideus. Dr. Ward's MSS.</i>				
<i>Menke. Potier. Chenu.</i>	<i>Unio subcroceus. Con.</i>				
<i>Mya pictorum. Forkaël.</i>	*Columbensis. <i>Lea.</i>				
<i>Unio pumilis. Zieg.</i>	Jamesianus. <i>Lea.</i>				
<i>Unio Pareyssi. Phil.</i>	*obesus. <i>Lea. Han.</i>				
	<i>Unio rivularis. Con.</i>				
	*Bissellianus. <i>Lea.</i>				

<sup>1</sup> *Unio discus* is found in Mictizuma River, Central America, and occurs white, and beautifully salmon color, as well as purple.

<sup>2</sup> Very like *U. Niloticus*, Fer., and may be only a variety.

<sup>3</sup> I am very much inclined to think *Bonneaudii* will prove to be the same with *Niloticus*.

<sup>4</sup> *Tetralasmus* will, I think, prove to be a large and perfect *camptodon*, Say.

<sup>5</sup> This fine shell, as well as *tetralasmus*, 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.

<sup>6</sup> The shell in the Academy of Nat. Sci., described and figured by Mr. Conrad, in his *Monography*, p. 45, as *declivis*, Say, I consider to be a middle-aged *camptodon*, Say. This, however, is not the opinion of all our conchologists. Professor Kirtland, in his *Ohio Report*, says that a shell answering Say's description of *declivis* is found in some of the tributaries of the Scioto River. This is the shell since described by Judge Tappan as *U. Sayii*, but which I have always believed to be *camptodon*.



NON-SYMPHYNOTE UNIONES. SMOOTH.	OBLONG.
	*Jewettii. <i>Lea.</i>
	*squalidus. <i>Lea.</i>
	*Pawensis. <i>Lea.</i>
	*hebes. <i>Lea.</i>
	*quadrilaterus. <i>Lea.</i>
	*indefinitus. <i>Lea.</i>
	*Hopetonensis. <i>Lea. Chenu.</i>
	*fraternus. <i>Lea.</i>
	*Cuvierianus. <i>Lea.</i>
	*Charlottensis. <i>Lea.</i>
	*Savannahensis. <i>Lea.</i>
	*Weldonensis. <i>Lea.</i>
	*Gastonensis. <i>Lea.</i>
	*humerosus. <i>Lea.</i>
	*nubilus. <i>Lea.</i>
	*Mecklenbergensis. <i>Lea.</i>
	*Baldwinensis. <i>Lea.</i>
*Roanokensis. <i>Lea. Chenu. Han.</i>	
*macer. <i>Lea.</i>	
*Neusensis. <i>Lea.</i>	

NON-SYMPHYNOTE UNIONES. SMOOTH.	OBLONG.
	*Roswellensis. <i>Lea.</i>
	*Postellii. <i>Lea.</i>
	*exolescens. <sup>1</sup> <i>Gould. Blan.</i>
	Prusii. <i>Bourg.</i>
	*Peguensis. <i>Anth.</i>
	*jejunus. <i>Lea. Chenu. Han.</i>
	*complanatus. <i>Solan. Lea. Gould.</i> <i>Adams. Han. Linsley. Dekay.</i> <i>Stimpson. Migh. Gerst.</i>
	<i>Mya complanata. Soland. Dill.</i>
	<i>Mya rigida. Wood.</i>
	<i>Mya purpurea. Eat.</i>
	<i>Unio violaceus. Spengler.</i>
	<i>Unio purpureus.<sup>2</sup> Say. Bar. Con.</i>
	<i>Unio rarisulcata. Lam. Menke.</i>
	<i>Unio coarctata. Lam. Menke.</i>
	<i>Unio purpurascens. Lam. Desh.<sup>3</sup></i> <i>Menke. Potier.</i>
	<i>Unio rhombula. Lam.</i>
	<i>Unio carinifera. Lam.</i>
	<i>Unio Georgina. Lam.</i>
	<i>Unio glabrata. Lam.</i>
	<i>Unio sulcidens. Lam. Chenu.</i>
	<i>Unio fluviatilis. Green.</i>
	<i>Unio tortuosus. Sow. Reeve.</i>
	*Northamptonensis. <i>Lea.</i>
	*percoarctatus. <i>Lea.</i>
	*squameus. <i>Lea.</i>
	planilaterus. <i>Con.</i>
*inusitatus. <i>Lea.</i>	

<sup>1</sup> I think this is the shell which Mr. Conrad figures in the *Jl. Acad. Nat. Sci.*, vol. 2, pl. 26, f. 6, but which he considered as a *U. complanatus*.

<sup>2</sup> Mr. Conrad is wrong, in his "Synoptical Table," in giving Mr. Say's name precedence, making *complanatus* a synonym.

<sup>3</sup> Deshayes, in *Ency. Meth. Vers.*, t. 2, p. 381, No. 9.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OBLONG.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	OBLONG.
		* <i>cicur.</i> <i>Lea.</i>			* <i>Raécensis.</i> <i>Lea.</i>
		* <i>cistellæformis.</i> <i>Lea.</i>			* <i>salebrosus.</i> <i>Lea.</i>
		* <i>Orontesensis.</i> <i>Lea.</i>			* <i>Uharéensis.</i> <i>Lea.</i>
		* <i>Livingstonensis.</i> <i>Lea.</i>			* <i>viridans.</i> <i>Lea.</i>
		* <i>Hallenbeckii.</i> <i>Lea.</i>			* <i>subinflatus.</i> <i>Con.</i>
		* <i>errans.</i> <i>Lea.</i>			* <i>Abbevillensis.</i> <i>Lea.</i>
		* <i>Damascensis.</i> <i>Lea.</i>			* <i>Raleighensis.</i> <i>Lea.</i>
		* <i>vicinus.</i> <i>Lea.</i>			* <i>Beaverensis.</i> <i>Lea.</i>
		* <i>virens.</i> <i>Lea.</i>			* <i>aberrans.</i> <i>Lea.</i>
		* <i>opacus.</i> <i>Lea.</i>			* <i>Orphaensis.</i> <i>Lea.</i>
		* <i>Catawbensis.</i> <i>Lea.</i>			<i>cultelliformis.</i> <sup>1</sup> <i>Con.</i>
		* <i>viridicatus.</i> <i>Lea.</i>			<i>Unio depressus.</i> <i>Con.</i> Not Lam.
		* <i>fumatus.</i> <i>Lea.</i>			* <i>symmetricus.</i> <i>Lea.</i>
		* <i>rostrum.</i> <i>Lea.</i>			<i>limatulus.</i> <i>Con.</i>
		* <i>hepaticus.</i> <i>Lea.</i>			* <i>Buddianus.</i> <i>Lea.</i>
		* <i>subniger.</i> <i>Lea.</i>			<i>Stuarti.</i> <i>Ad. &amp; An.</i>
		* <i>æquatus.</i> <i>Lea.</i>			* <i>lutulentus.</i> <i>Gould.</i>
		* <i>subflavus.</i> <i>Lea.</i>			* <i>Griffithianus.</i> <i>Lea. Han.</i>
		* <i>similis.</i> <i>Lea.</i>			* <i>mediocris.</i> <i>Lea.</i>
* <i>nigellus.</i> <i>Lea.</i>	* <i>Valentinus.</i> <i>Rossm. Bourg.</i>				
* <i>denigratus.</i> <i>Lea.</i>	<i>Zelebori.</i> <i>Fraun.</i>				

<sup>1</sup> *Unio cultelliformis* is described as coming from Australia. It is so much like one of our varieties of *complanatus*, that I am induced to believe that some error of locality must have occurred. In a subsequent paper (Jl. A. N. S., v. 2, p. 295), Mr. Conrad makes *cultelliformis* a synonym to *U. depressus*, Lam., which he also describes and figures, pl. 26, f. 2; but I think that *cultelliformis* should rather be considered a synonym to *complanatus*, if it be not a true species, of which I have expressed a doubt above.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	OBLONG. Mexicanus. <i>Phili.</i>  *ampullaceus. <i>Lea.</i>  *mutabilis. <i>Lea.</i>  *Æthiops. <i>Lea.</i>  *auratus. <i>Swain.</i> <i>Niäa aurata. Swain.</i> <i>Unio obtusa.<sup>1</sup> Fer.<sup>2</sup></i> <i>Unio depressus. D'Orb.</i> <i>Unio Chiloensis. Phili.<sup>3</sup></i> <i>Unio Gassiesii. Grat.</i> <i>Unio fragilis. Swain.</i>  *atratus. <i>Sow. Han.</i> <i>Niäa atrata. Swain.</i> <i>Niäa fragilis. Swain.</i> <i>Unio auratus. Phili.</i> <i>Unio Chilensis. Gray.</i> <i>Unio Molinæ. Phili.</i>  *lepidior. <sup>4</sup> <i>Lea.</i> <i>Unio lepidus. Lea.</i>  *Casablancae. <i>Phili.<sup>5</sup></i>  *Araucanus. <i>Phili.</i>  *confertus. <i>Lea. Han.</i>  *l <sup>u</sup> gubris. <i>Lea. Han.</i>  *piceus. <i>Lea.</i>	NON-SYMPHYNOTE UNIONES.	SMOOTH.	OBLONG. *insulsus. <i>Lea.</i>  *obnubilus. <i>Lea.</i>  *Geddingsianus. <i>Lea. Chenu.</i>  *similis. <i>Lea.</i>  *tetricus. <i>Lea.</i>  *Whiteianus. <i>Lea.</i>  *Kullethensis. <i>Lea.</i>  *Mardinensis. <i>Lea.</i>  *fuliginosus. <i>Lea.</i>  *paliatus. <i>Ravenel's Letter.</i>  *Strebelii. <i>Lea.</i>  *camelopardilis. <i>Lea.</i>  *Tuomeyi. <i>Lea.</i>  *Chathamensis. <i>Lea.</i>  *tortivus. <i>Lea. Chenu.</i>  *purpurellus. <i>Lea.</i>  <i>occidentalis. Con.</i>  <i>Watercensis. Lea.</i> <i>Unio Raveneli.<sup>6</sup> Con.</i>
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<sup>1</sup> Fide D'Orbigny, *Mag. de Zoology*, 1835.

<sup>2</sup> D'Orbigny says this is the *depressus* of Lesson, and figured and described by Lesson in the *Voyage de la Coquille*. Now the description of Lamarck answers to the figure of Lesson, and I am disposed to think that the two are the same. I do not know where Ferussac described *obtusa*.

<sup>3</sup> A specimen of *U. auratus* from Chiloe, South America, sent to me by Dr. Vandembusch from Bremen, was labelled *U. Chiloensis*, Philippi.

<sup>4</sup> *Lepidus* being preoccupied by Dr. Gould for a Florida species, I propose *lepidior* for my species.

<sup>5</sup> An authentic specimen was given to me by Dr. Dunker in Cassel, and although very close to *atratus*, I think it will prove to be a distinct species.

<sup>6</sup> 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.		NON-SYMPHYNOTE UNIONES.	
SMOOTH.		SMOOTH.	
OBLONG.		OBLONG.	
*fulvus. <i>Lea. Han.</i>		*depressus. <i>Lam. Less. Chenu. Küst. Han.</i>	
<i>Unio icterinus. Con.</i>		<i>Unio Balonnensis.</i> <sup>4</sup> <i>Con.</i>	
*rufusculus. <i>Lea.</i>		<i>Unio ambiguus. Phil.</i>	
*Gibbesianus. <i>Lea.</i>		<i>Unio profugus. Gould.</i>	
*sordidus. <i>Lca.</i>		<i>Unio Angasi. Reeve. (No. 282.)</i> <sup>5</sup>	
*Dariensis. <i>Lea. Chenu.</i>		<i>angustus. Lam. Han.</i>	
*Congaræus. <i>Lea. Chenu. Han.</i>		*cacao. <i>Lea.</i>	
*merus. <i>Lcā.</i>		*modestus. <i>Fer.</i>	
*Charruanus. <sup>1</sup> <i>D'Orb.</i>		*suavidicus. <i>Lea.</i>	
<i>rhuacoicus. D'Orb. Von Mar.</i>		<i>famelicus. Gould.</i>	
*neglectus. <i>Lea.</i>		*Couchianus. <i>Lea.</i>	
*subplanus. <i>Con.</i>		*litoralis. <i>Drap. Lam. Mill. Pfeif. Rossm.</i> <sup>6</sup> <i>Des Moul. Grat. Brard. Desh. Cuv. Maton and Racket. Bouil. Gras. Bronn. Morc. Merm. Gassies. Goupil. Dupuy. Puton. Potier. Graells. Mouss. Han. Caill.</i>	
*manubius. <i>Gould.</i> <sup>2</sup>		<i>Unio crassus. Nil. Phil. Menke. Rossm. Moq.</i>	
*declivis. <i>Say. Desh. Küst. Han.</i>		<i>Unio brevisialis. Lam.</i>	
<i>Unio geometricus.</i> <sup>3</sup> <i>Lea.</i>		<i>Unio nana. Lam. Dup. Bourg.</i>	
<i>Unio excultus. Con.</i>		<i>Unio subtetragona. Mich. Dup. Merm. Graells. Gras.</i>	
*paludicolus. <i>Gould.</i>		<i>Unio incurvus. Lea. Chenu.</i>	
*Blandingianus. <i>Lea. Küst.</i>		<i>Unio Pianensis. Farines. Dup. Graells.</i>	
<i>Unio rivicolus. Con.</i>		<i>Unio granosus. Schum.</i>	
*quadratus. <i>Lea.</i>			

<sup>1</sup> The two specimens sent to me by M. D'Orbigny are much smaller than the adult figured by him in *Voy. Am. Mer.*, and although very like *delodontus*, Lam., are different in outline and in some minor characters.

<sup>2</sup> I am disposed to believe that this is only a variety of *declivis*, Say. I have specimens from Texas which indicate this.

<sup>3</sup> I do not find this or *declivis* in Mr. Say's *Synonymy*. He has, however, priority.

<sup>4</sup> In a subsequent paper, *Jl. A. N. S.*, vol. ii. p. 295, Mr. Conrad says that, in referring the shell to *depressus*, Lam., I have committed "an oversight." I do not admit this, but consider myself to be correct, having long had a specimen of *U. depressus* in my possession, and having seen it frequently in various cabinets in Europe.

<sup>5</sup> Mr. Reeve cites my MS. for this name. I have no recollection of it.

<sup>6</sup> Rossmässler, *Iconographie*, vol. iii. p. 36, describes a variety under the name of *umbonatus*.



NON-SYMPHYNOTE UNIONES.	SMOOTH.	SUBROTUND.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	SUBROTUND.
		<p><i>Myt. membranacea.</i> Mat.  <i>Unio Matoniana.</i> D'Orb.  <i>Unio subtrapezius</i> (junior). Phil.  <i>Unio membranaceus.</i> Phil.</p> <p>*<i>variabilis.</i> Mat. Han. D'Orb.  <i>Mya variabilis.</i><sup>1</sup> Mat. Wood. Dill.</p> <p>*<i>rotundus.</i> Spix. Mori.  <i>Diplodon rotundus.</i> Spix.</p> <p>Fontainianus? D'Orb. Hupé.</p> <p>*<i>patelloides.</i> Lea.</p> <p>*<i>nocturnus.</i> Lea.</p> <p>*<i>gratus.</i> Lea.</p> <p>*<i>retusus.</i><sup>2</sup> Lam. Con. Menke. Küst.  Han.  <i>Unio torsa.</i> Raf. Sh. &amp; Eat. Potier.  Chenu.  <i>Unio obtusa.</i><sup>3</sup> Cuvier.  <i>Unio cordatus</i> (female). Küst.</p> <p>*<i>ebenus.</i> Lea. Chenu. Han.  <i>Unio mytiloides.</i> Con.; not Raf.  <i>Unio obliquus.</i> Con. Küst.  <i>Unio Gouldianus.</i> Ward.</p>			<p>*<i>Lesueurianus.</i> Lea. Chenu.</p> <p>*<i>Lyonii.</i> Lea.</p> <p>*<i>Lewisii.</i> Lea.</p> <p>*<i>nucleopsis.</i> Con.</p> <p>*<i>fibuloides.</i> Lea.</p> <p>*<i>Kirtlandianus.</i><sup>4</sup> Lea. Han.</p> <p>Evansi. Ad. &amp; An. Reeve.</p> <p>*<i>pilaris.</i> Lea. Chenu.</p> <p>*<i>dollabelloides.</i> Lea. Chenu.</p> <p>*<i>Thorntonii.</i> Lea.</p> <p>*<i>subrotundus.</i> Lea. Chenu. Han.  <i>Unio politus?</i><sup>5</sup> Say. Küst.  <i>Unio brevisialis?</i> Crouch.  <i>Unio politus.</i> Con.  <i>Unio eicatricosus.</i> Reeve, Sp. 50.</p> <p>*<i>coccineus.</i> Lea. Chenu. Han.  <i>Unio coccineus.</i> Dr. Hildreth's Letter.  <i>Unio coccineus.</i> Con.</p>

<sup>1</sup> The figure 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. Lamarek considered this to be the same with his *Hyria corrugata*; but it is very different.

(Since the publication of this note, I have received, from M. Moricand, a suite of specimens of *Paranensis*, which indicate, unquestionably, a distinct species. The beaks of *rotundus*, Wag., have not the strong folds on them, while the *Paranensis* has many elevated radiations from the beaks. The outline too of the former is more orbicular.)

<sup>2</sup> M. Deshayes thinks this is *incurvus*, Say. I do not know where Mr. Say published a shell under that name.

<sup>3</sup> In the recent edition of Cuvier *Reg. An.*, by his pupils, there is a beautiful figure of *U. retusus*, Lam., under the name of *U. obtusa*, Say. I am not aware that Mr. Say described a *Unio* under that name. The *retusus*, Lam., is a common, well-known, and perfectly distinct species.

<sup>4</sup> Prof. Kirtland, in his *Ohio Report*, expresses his opinion of this being only a very flat variety of *subrotundus* (nobis).

<sup>5</sup> Mr. Conrad cites Mr. Say's table of synonymy for *politus*, but I am not aware of Mr. S. ever having described it.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	SUBROTUND.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	WIDE.
		<p><i>Unio catillus</i>.<sup>1</sup> Con. Küst.  <i>Unio cuneus</i>? Con.            *ornatus. Lea.            *semirugatus. Lam. Menke. Chenu.            *Emesaensis. Lea.</p>			<p>WIDE.            *Shepardianus. Lea. Con. Küst.                Chenu. Han.            Bensonii.<sup>2</sup> Lea.  <i>An. soleniformis</i>. Ben.  <i>Spatha soleniformis</i>. Ben. (In lit.)            Duttonianus. Lea. Chenu.            *folliculatus. Lea. Chenu. Han.            *rectus. Lam. Sh. &amp; Eat. Swain.                Adams. Han. Dekay. Potier.                Küst. Chenu.  <i>Unio praelongus</i>. Barn. Hild.  <i>Unio arquatus</i>? Con.<sup>3</sup>  <i>Unio recta</i>. Valen.  <i>Unio Sageri</i>.<sup>4</sup> Con.</p>

<sup>1</sup> The late Dr. R. E. Griffith had in his collection a shell marked *catillus*, he thought by Mr. Conrad himself, but which I think was only a variety of *obliquus*, Lam.; certainly it is not the species figured by Mr. Conrad. In a letter from Dr. Ward in 1836, he says, "*U. catillus* runs into *coccineus*, so that Mr. Conrad would be puzzled to part the species in my collection. They are only varieties of the same species."

<sup>2</sup> A single old valve (diam. .7, length 1.5, breadth .6 inches) was submitted to me, with a complete young specimen 2.3 inches wide, by W. H. Benson, Esq., of London. The old valve is imperfect along the dorsal margin, but still there may be observed imperfect cardinal and lateral teeth. In the young specimen, the lateral teeth, while being very delicate and circular, are perfectly well defined, being double in the left and single in the right valve. As Mr. Benson's name (*soleniformis*, Jl. Asiatic Sec., vol. v., p. 750, 1836) has already been used for a *Unio*, I propose *Bensonii* for it in honor of the discoverer, who has done so much for the Natural History of the East of Asia.

<sup>3</sup> I have a deformed *rectus* so exactly like the figure given by Mr. Conrad that I cannot help thinking they are the same.

<sup>4</sup> 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. Drs. Kirtland and Ward, and Judge Tappan, consider it a variety of *gibbosus* of Barnes. In Mr. Conrad's *Synopsis* (1852) he seems to have abandoned the name, as he has not inserted it there.

<sup>5</sup> M. Deshayes (2d edit. Lamarck) doubts if *lanceolatus* be not the young of *anodontoides*, "of Say." (*Anodontoides* was not described by Mr. Say, but by myself.) 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.

NON-SYMPHYNOTE UNIONES. SMOOTH.	WIDE.	<p>*viridulus. <i>Lea.</i></p> <p>*anodontoides. <i>Lea. Kirtl. Chenu. Adams. Han. Unio teres? Raf. Unio teres. Con.</i></p> <p>*rasus. <i>Lea.</i></p> <p>*parallelopipedon. <i>Lea. D'Orb. Han.</i></p> <p>*acutirostris. <i>Lea.</i></p> <p>*platyrhynchus.<sup>1</sup> <i>Rossm. Schmidt. Potier. Por. Villa. Han.</i></p> <p>*Cailliaudii. <i>Fer. H. Adams. Unio lithophagus. Zieg. Unio teretiusculus. Phil.</i></p> <p>*Ingallsianus. <i>Lea.</i></p> <p>*sagittarius. <i>Lea. Von Mart.</i></p> <p>*tumidus.<sup>2</sup> <i>Retz. Speng. Schum. Nils. Pfeif. Villa. Rossm. Brown. Menke. Stein. Put. Potier. Dup. Forbes. Mouss. Fitz. Han. Moq. Caill.</i></p>	NON-SYMPHYNOTE UNIONES. SMOOTH.	WIDE.	<p><i>Unio ovalis. Retz. Flem. Sou. Villa. Brown. Gray. Caill.</i></p> <p><i>Mya ovalis. Monta.</i></p> <p><i>Mya ovata. Don. Mat. Wood. Dill.</i></p> <p><i>Mya depressa. Don.</i></p> <p><i>Mysca solida. Turt.</i></p> <p><i>Mysca ovata. Swain.</i></p> <p><i>Unio nodulosa. Lam. Menke.</i></p> <p><i>Unio Michaudiana? Des Moul. Dup.</i></p> <p><i>Unio ovata. Studer. Bouil. Menke. Fitz.</i></p> <p><i>Unio rostrata. Stud.</i></p> <p><i>Unio Limagnæ. Bouil.</i></p> <p><i>Unio solida. Villa.</i></p> <p><i>Unio arcuatus. Bouch.</i></p> <p>*pictorum.<sup>3</sup> <i>Retz. Speng. Lam. Cur. Mill. Pfeif. Drap. Bosc. Don. Blain. Crouch. Flem. Des Moul. Grat. Bouil. Menke. Nils. Stein. Brard. Brown. Puton. Desh. Potier. Por. Dup. Klees. Merm. Küst. Alder. Graells. Villa. Forbes. Schmidt. Rossm. Guerin. Morelet. Gras. Goupil. Bouch. Schrenk. Fisch. L. Waard. Fitz. Midd. Gras. Gerst. H. &amp; A. Adams. Moq. Han. Caill.</i></p>
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<sup>1</sup> This is a curious and very interesting shell which I received from Vienna. Its habitat is Carynthia. It may be only a remarkable variety of *pictorum*, Retz. Such is the opinion of some of the German malacologists.

<sup>2</sup> The *tumidus*, Retzius, is, I think, without doubt, the same as *ovalis*, Retzius, and other European authors. But, Retzius having described *tumidus* before *ovalis*, the former name must take priority. Prof. Mousson gave me in Zurich a specimen of this species, which, he says, came from Java.

<sup>3</sup> The well-known *Unio pictorum* of European authors, so widely distributed throughout that quarter of the globe, has been the fruitful source of trouble and perplexity to naturalists who have studied this branch of Malacology. I have seen no reason to change my opinion, since the publication of the last edition of this Synopsis, as to the synonymy, which, unfortunately, is still going on to increase, to the great embarrassment and injury of this branch of the science. I am well aware that some able writers in Europe have endeavored to stem this tendency to multiply so dreadful a synonymy, such as *U. pictorum* and *An. cygnea* present; and I find in the admirable work of Forbes and Hanley (now nearly finished), on the *Malacology of Great Britain*, ideas which are so entirely parallel with my own, that I cannot refrain from making the following extract. They say they "do not observe in Rossmæssler figures of continental forms of this polymorphous shell, any of which our islands do not exhibit a nearly analogous representation. If a certain platitude of language be demanded in a description of the preceding species, far more requisite is it that our diagnosis of the present one should be sufficiently exclusive," p. 144. (See note on *An. cygnea*.)



## WIDE.

- Mya pictorum*. Lin. Müll. Born.  
Poli. Schröt. Pennant. Dill.  
Wood. Mat. Schreib. Da Cost.  
Alten.  
*Musculus angustior*. List. Hist. Ani-  
malia, p. 149.  
*Mya corrugata Maroccana*.<sup>1</sup> Chem.  
— *margaritica*. Klein.  
— *augusta*. Klein.  
Long thick horse mussel. Petiv.  
*Mya nodosa*. Martini. Lin. Schreib.  
Wood. Dill.  
*Mysca pictorum*. Turt.  
*Potomida sicula*. Swain.<sup>2</sup>  
*Unio delphinus*. Speng.  
*Unio inflatus*. Stud.  
*Unio rostratus*. Lam. Pfeif. Mich.  
Desh. Bouil. Gras. Puton.  
Potier. Brown. Villa. Waard.  
Chenu. Fitz. Gras.  
*Unio manca*. Lam. Millet. Dup.  
Bourg.  
*Unio castaneus*. Müll.  
*Unio elongatulus*. Mühl. Rossm.  
Potier. Por. Dup. Villa.  
*Unio Turtonii*. Payr. Desh. Phil.  
Dup. Bourg.  
*Unio lobatata*. De Cr. and J.<sup>3</sup>  
*Unio Capigliolo*. Payr. Desh. More.  
Dup. Rossm. Grat. Moq.  
*Unio Requienii*. Mich. Rossm. Gas-  
sies. Potier. Dup. Gras. Grat.  
Mous. Bourg. Stab. Moq.  
*Unio Deshayesii*. Mich. Desh.  
Rossm. Brown. Gras. Grat.  
*Unio platyrinchoideus*. Dup. Bourg.

## WIDE.

- Unio limosus*. Nil. Rossm.  
*Unio longirostris*. Zeigl. Potier.  
Por. Rossm. Villa. Schmidt.  
*Unio lemovicense*. Fer. Menke.  
*Unio retusus*. Hehl.  
*Unio ventrosus*. Küster.  
*Unio levigatus*. Küster.  
*Unio latirostris*. Küster.  
*Unio concinnus*. Küster.  
*Unio corrosus*. Villa. Por.  
*Unio Spinelli*. Villa.  
*Unio pallens*. Parreyss. Küst.  
*Unio dactylus*. Morelet.  
*Unio mucidus*. Morelet.  
*Unio arcuatus*. Bouch. Dup.  
*Unio Arduisianus*. Reyniès.  
*Unio Muelleri*.<sup>4</sup> Rossm.  
*Unio ponderosus*. Spitz. Rossm.  
*Unio graniger*. Zieg.  
*Unio decipiens*. Zieg. MSS. Bourg.  
*Unio Nathusii*. Küst.  
*Unio vindiflavus*. Küst.  
*Unio Petrovichii*. Küst.  
*Unio dubius*. Fitz.  
*Unio Ronsii*. Dup.  
*Unio proechus*. Bourg.  
*Unio actaphilus*. Bourg.  
*Unio vulgaris*. Stab.  
*Unio Blauneri*. Shutt. Stab.  
*Unio subreneformis*. Bourg.  
*Unio Penchinatianus*. Bourg.  
*Unio Graellsianus*. Bourg.  
*Unio Courquinianus*. Bourg.  
  
\**elongatulus*. Pfeif. Han.  
*Unio Aradæ*. Phil.

<sup>1</sup> Chemnitz figures this shell, vol. vi. table 3, Figs. 23 and 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.

<sup>2</sup> I suspect this will prove to be the same as *elongatulus*, Pfeif., which may itself be only a var. of *pictorum*. Swainson and Pfeiffer obtained them from Sicily.

<sup>3</sup> Fide Philippi. Michaux's figure has more the appearance of *U. Batavus*.

<sup>4</sup> I think this will be found to be a deformed *pictorum*.

NON-SYMPHYNOTE UNIONES.	SMOOTH.	WIDE.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	WIDE.
		<p><i>Unio Gargottæ</i>. Phil. More. Gerst. Rossm.</p> <p>*Moreleti.<sup>1</sup> Desh.</p> <p>*sagittæformis. Lea.</p> <p>*rostriformis. Lea.</p> <p>*gracilentus. Lea.</p> <p>*nasutus.<sup>2</sup> Say. Barn. Swain. Han. Gould. Linsl. Dekay.</p> <p><i>Unio rostratus</i>. Valen.</p> <p><i>Mya nasuta</i>. Wood. Eat.</p> <p><i>Eurynea nasuta</i>. Stimpson. (Agass. MSS.)</p> <p>*Mississippiensis. Con.</p> <p><i>Unio Cocoduensis</i>. Reeve.</p> <p>*aquilus. Lea.</p> <p>*protensus. Lea.</p> <p>*extensus. Lea.</p> <p>*Burkensis. Lea.</p> <p>*oblatus. Lea.</p> <p>*Maconensis. Lea.</p>			<p>*naviculoides. Lea.</p> <p>*perlatus. Lea.</p> <p>*Hazlehurstianus. Lea.</p> <p>*Barrattii. Lea.</p> <p>productus.<sup>3</sup> Con. Küst. Han.</p> <p>*viridiradiatus. Lea.</p> <p>*pullatus. Lea.</p> <p>*Fisherianus. Lea. Chenu. Han.</p> <p>*nasutulus. Lea.</p> <p>*Emmousii. Lea.</p> <p>*ahceneus. Lea.</p> <p>*Jayanus. Lea. Chenu. Han.</p> <p>*marginalis. Lam. Desh. Blan. Han.</p> <p><i>Unio anodontina</i>. Lam. Blan.</p> <p><i>Unio evanescens?</i> Mouss.</p> <p>*iris.<sup>4</sup> Lea. Desh. Chenu. Han.</p> <p><i>Unio subrostratus</i>. Say.</p> <p><i>Unio nebulosus?</i> Con.</p> <p>*Novi-Eboraci.<sup>5</sup> Lea. Dekay. Chenu.</p>

<sup>1</sup> This is no doubt a good species. I have seen a very good specimen belonging to the cabinet of the Rev. Mr. Beadle, of Hartford, Conn.

<sup>2</sup> Mr. Agassiz says that the genus *Unio*, Retz., is represented in this country by *U. nasutus*, Lam. Lamarck's *nasutus* is *gibbosus*, Bar. Mr. Say preoccupied the name *nasutus* in 1816. Lamarck published in 1819. In the synonymy of *gibbosus*, I have in all my editions of this work placed Lamarck's *nasutus* as a synonym to *gibbosus*, Bar.

<sup>3</sup> This is probably the same as *folliculatus*, Lea, which latter name has precedence.

<sup>4</sup> 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, 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*.

<sup>5</sup> *Novi-Eboraci* and *iris* are in the outlines nearly identical, but in the soft parts there are differences which I have pointed out in the *Journal of the Academy Nat. Sciences*, vol. v., N. S., and *Observations on Unio*, vol. x.

## WIDE.

- Unio opalinus.* Anth.  
 \**fatuus.* Lea. Chenu.  
 \**tenuissimus.* Lea. Han.  
*Symp. tenuissima.* Lea. Sh. & Eat.  
*An. purpurascens.* Swain.  
*Unio velum.* Say.  
*Unio leptodon.* Con.  
 \**bilineatus.* Lea. Ben. Blan.<sup>1</sup> Han.  
*Symp. bilineata.* Lea, in Trans. Am.  
 P. S.  
 \**Corrianus.* Lea. Blan.<sup>1</sup> Han.  
 \**Mercerii.* Lea.  
 \**orientalis.* Lea. Chenu.  
*Unio productus.* Mouss.<sup>2</sup>  
*Unio Sumatrensis.* Fide Martens.  
 \**phaseolus.* Hild. Sh. & Eat. Han.  
*Unio planulatus.* Lea. Desh. Chenu.  
*Unio cuneatus.*<sup>3</sup> Barn. (White var.)  
 \**rnfus.* Lea.  
*arcus.* Con. Han.  
 \**gibbosus.* Bar. Sh. & Eat. Hild.  
 Han.  
*Unio mucronatus.* Bar.  
*Unio nasuta.* Lam. Cuv.  
*Unio dilatata?* Raf.  
*Unio dilatatus.* Con. Küst.  
*Mya gibbosa.* Eat.  
*Mya mucronata.* Eat.

## WIDE.

- \**subgibbosus.* Lea.  
 \**contractus.* Lea.  
 \**arctior.* Lea. Chenu. Han.  
 \**Tabascoensis.* Phil.  
 \**Patagonicus.* D'Orb. Han.  
 \**Vaughanianus.* Lea. Chenu. Han.  
*Unio Carolinensis.* Prof. Ravenel's  
 Letter.  
 OBOVATE.  
 \**purpuratus.* Lam. Potier. Han.  
*Mya ventricosa.*<sup>4</sup> Solan. Humphreys?  
*Unio ater.* Lea. Desh. Chenu.  
*Unio lugubris.* Say.  
*Unio Poulsoni.* Con.  
*Naidú atra.* Swain.  
 \**permiscens.* Lea.  
 \**dolosus.* Lea.  
 \**biangulatus.* Lea. Chenu.  
*rhombeus.* Wag. Han.  
*Diplodon rhombeum.* Spix.  
 \**cuprinus.* Lea. Chenu. Han.  
*Unio metallicus.*<sup>5</sup> Say.  
*Unio æreus.* Reeve.  
 \**Beskeanus.* Dink.  
 \**Brownii.* Lea.

<sup>1</sup> Benson and Blanford both consider *bilineatus* and *Corrianus* to be different stages of growth of *marginalis*, Lam., and may possibly be correct.

<sup>2</sup> In the last edition I considered this as a distinct species, but have since been satisfied that it is the same as *orientalis* (nobis).

<sup>3</sup> In note to Dr. Hildreth's Memoir on the shells in the vicinity of Marietta, Ohio, published in *Silliman's Journal*.

<sup>4</sup> Fide Ferussae.

<sup>5</sup> 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.	OBOVATE.	NON-SYMPHYNOTE UNIONES.	SMOOTH.	ARCULATE.
		*Sikkimensis. <i>Lea.</i>			<i>Unio sinuata.</i> <i>Retz. Lam. Children.</i> <sup>4</sup>
		*papyraceus. <i>Gould.</i>			<i>Blain. Dup. Desh. Menke. Rossm.</i>
		*Boydianus. <i>Lea. Dekay. Chenu.</i>			<i>Graells. Puton. Reyniés. Gassies.</i>
		Floridensis. <i>Lea.</i>			<i>Grat. Moq.</i>
		pellucidus. <i>Lea.</i>			<i>Unio rugosa.</i> <i>Poir.</i>
		*amygdalum. <i>Lea.</i>			<i>Unio araris.</i> <i>Barbié.</i>
		*Saladoensis. <i>Lea.</i>			<i>Unio Barraudii.</i> <i>Bonhome. Grat.</i>
		*lenior. <i>Lea. Chenu.</i>			<i>Potamida sinuata.</i> <i>Swain.</i>
		*hyalinus. <i>Lea.</i>			*decumbens. <i>Lea.</i>
		*nigrinus. <i>Lea.</i>			*monodontus. <sup>5</sup> <i>Say. Sh. &amp; Eat. Desh.</i>
		*Tappanianus. <sup>1</sup> <i>Lea. Han.</i>			<i>Han.</i>
		<i>Unio viridis.</i> <i>Con.</i>			<i>Unio soleniformis.</i> <i>Lea. Chenu.</i>
		*pertenuis. <i>Lea.</i>			*Lazarus. <i>Lea.</i>
		*foliaceus. <sup>2</sup> <i>Gould. Blan.</i>			*arctatus. <i>Con. Han.</i>
		*obtusus. <i>Lea. Chenu.</i>			*emarginatus. <i>Lea. Chenu. Han.</i>
		ARCULATE.			*Laonensis. <i>Lea.</i>
		*crassus. <sup>3</sup> <i>Retz. Speng. Nilss. Schrenk.</i>			
		<i>Unio crassissimus.</i> <i>Fer. Des Moul.</i>			
<i>Grat. Merm. Han.</i>					
<i>Unio auricularius.</i> <i>Speng.</i>					
<i>Unio margaritacea.</i> <i>Drap.</i>					
	<i>Unio Abyssinicus.</i> <i>Mart.</i>				
	<i>Unio acuminatus.</i> <i>H. Adams.</i>				
	<i>Unio æruginosus.</i> <i>Morelet.</i>				
	<i>Unio Aleroni.</i> <i>Mass.</i>				
	<i>Unio altus.</i> <i>Con.</i>				
	<i>Unio antiquatus.</i> <i>Anton.</i>				

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:—

<sup>1</sup> A fine suite of this species has been kindly sent to me recently by Prof. Haldeman, of Columbia, Penn., taken from the Susquehanna River at that place. In most of them, I find the cardinal teeth of the left valve to be trifid, and the lateral teeth of the same valve somewhat divided. In the right valve, the cardinal tooth is nearly as long as the lateral tooth; in this taking somewhat of the character of *Triquetra subviridis*, Klein. (*Hyria* of Lamarck).

<sup>2</sup> I am disposed to think that this may prove to be the same with *Javanus* (nobis).

<sup>3</sup> See note to *Margaritana margaritifera*.

<sup>4</sup> I think Mr. Children meant this species, but his figure (69) is evidently *Unio alatus*, Say, although he cites it as European.

<sup>5</sup> This properly belongs to *Margaritana*. It is closely allied to *M. margaritifera*. See my notes on the soft parts, *Observations*, vol. x. p. 58, and vol. vii. p. 43.

- Unio aplatus. *Swain.*  
 Unio Bakeri. *H. Adams.*  
 Unio bicelatus. *Reeve.*  
 Unio Bigorrensis. *Millet. Grat.*  
 Unio Bonplandii. *Valen.*  
 Unio Boscianus. *Dunker.*  
 Unio calimatorum. *Morelet.*  
 Unio Cambojensis.<sup>1</sup> *Sow.*  
 Unio Carniolicus. *Ziegler. Potier.*  
 Unio caudiculatus. *Mart.*  
 Unio Colehaguensis. *Phili.*  
 Unio conus. *Speng.*  
 Unio coriaceus. *Dunker.*  
 Unio crispisulcatus. *Ben.*  
 Unio Cyamus. *Phil.*  
 Unio Damnoica. *D'Orb.*  
 Unio Danielis. *Gass.*  
 Unio Demboæ. *Reeve.*  
 Unio digitatus. *Morelet.*  
 Unio diplodon. *Phili.*  
 Unio divergens.<sup>2</sup> *Benson.*  
 Unio diversus. *Conrad.*  
 Unio Drouetii. *Dup.*  
 Unio ellipsiformis. *Con.*  
 Unio episcopalis. *Trist.*  
 Unio errosus. *Jay's Cat.*  
 Unio flavicans. *Vid.*  
 Unio Fokkesi. *Dunk.*  
 Unio Foncki. *Phili.*  
 Unio fontanus. *Con.*  
 Unio fuligo. *Reeve, Conch. Icon., No.*  
     154, 40.  
 Unio furvus. *Con.*  
 Unio gangrenosus. *Schmidt.*  
 Unio gibbus. *Speng.*  
 Unio glaucinus. *Zieg. Por.*  
 Unio Grandensis. *Con.*  
 Unio granulifera. *Dunker.*  
 Unio Grœnlandicus. *Schrö. Fer. Mörch.*  
 Unio Hjalmarsoni. *Dunk.*  
 Unio Hochstetterii. *Krauss.*  
 Unio Hueti.<sup>3</sup> *Bourg.*  
 Unio ianthinus. *Phili.*  
 Unio imbricatus. *Mörch.*  
 Unio iridescens. *Con.*  
 Unio Jacobæus. *Phili.*  
 Unio Jacqueminii. *Dup.*  
 Unio Jenkinsianus. *Ben.*  
 Unio Juliani. *Rang.*  
 Unio lævirostris. *Ben.*  
 Unio Landbeckii. *Phili.*  
 Unio Largillierti. *Phili.*  
 Unio latissimus. *Sow.*  
 Unio Leioma. *Ben.*  
 Unio ligula. *Mouss.*  
 Unio longidentatus. *Anton.*  
 Unio longus. *Phili.*  
 Unio Maccarthyanus. *Bourg.*  
 Unio macilentus. *Ben.*  
 Unio Massini. *More.*  
 Unio megapterus. *More.*  
 Unio merdiger. *Reeve.*  
 Unio Merodabensis. *Vondembusch.*  
 Unio metastriatus. *Con.*  
 Unio micellus. *More.*  
 Unio micropterus. *More.*  
 Unio montanus. *Phili.*  
 Unio Moravicus. *Jay's Cat.*  
 Unio Morini. *Morelet.*  
 Unio Mosambiccensis. *Mart.*  
 Unio Moulinsianus. *Dup.*  
 Unio musivus. *Speng.*  
 Unio mytiloides. *Desh.*  
 Unio nigricans. *Fitz.*  
 Unio nitidens. *Fer.*  
 Unio nuculinus. *Phili.*  
 Unio nuperus. *Zieg.*  
 Unio obtusa. *Potier and Michaud.*  
 Unio orientalis. *Fer. Parr.*  
 Unio ostreatus. *Morelet.*  
 Unio Oxyrynchus. *Mart.*  
 Unio pachysoma. *Ben.*  
 Unio Paivanus. *More.*  
 Unio paludosus. *Morelet.*  
 Unio parallelus.<sup>4</sup> *Con.*  
 Unio Pequottinus. *Linsley.*

<sup>1</sup> Mr. Boivin gave me a *U. parallelopipedon* under this name.

<sup>2</sup> See note on *U. Leaii*.

<sup>3</sup> Is this not a *Monocondylæa*?

<sup>4</sup> This name is used by Mr. Sowerby for a fossil species, and Mr. Conrad subsequently changed it to *porrectus* on that account; but Mr. Sowerby has also used the latter name!!

Unio Pfeifferi. *Dunker.*  
 Unio Philippii. *Dup.*  
 Unio pinax. *Ben.*  
 Unio plagiosoma. *Ben.*  
 Unio planivalvis. *Morelet.*  
 Unio plombarius. *Villa.*  
 Unio porrectus. *Con.*  
 Unio prasinatus. *Con.*  
 Unio preciosus. *Fer.*  
 Unio pruneosus. *Zieg.*  
 Unio psoricus. *Morelet.*  
 Unio Pugio. *Ben. Blan.*  
 Unio pulchellus. *Fer.*  
 Unio purpuratus. *Say.*  
 Unio radula. *Ben. Blan.*  
 Unio rectilinearis. *Sow.*  
 Unio Reyniesii. *Mich.*  
 Unio Rothi. *Bourg.*  
 Unio Rousii. *Dup.*  
 Unio rugosus. *Anton.*  
 Unio Schlegelii. *Martens.*  
 Unio Schwerzenbachii. *Bourg.*  
 Unio Scobina. *Ben. Blan.*  
 Unio seutulatus. *Morelet.*  
 Unio seutum. *Sow. Reeve.*  
 Unio semiplicatus. *Troschel.*  
 Unio semiquadrata. *Sow.*  
 Unio Seneltensis. *Gass.*  
 Unio Sennaarensis. *Küst.*  
 Unio simonis. *Trist.*  
 Unio Sitifensis. *Mörch.*  
 Unio smaragdites. *Ben.*  
 Unio solidulus. *Phili.*  
 Unio spheniopsis. *Morelet.*  
 Unio Steveniana. *Krynicky.*

Unio Taumilapanus. *Con.*  
 Unio testudineus. *Morelet.*  
 Unio testudinarius. *Speng.*  
 Unio Theca. *Ben. Blan.*  
 Unio triembolus. *Ben.*  
 Unio trirostris. *Ben.*  
 Unio truncatosus. *Potier.*  
 Unio truncatus. *Speng.*  
 Unio uber. *Con.*  
 Unio Valdivianus. *Phili.*  
 Unio venustus.<sup>1</sup> *More.*  
 Unio vellicatus. *Reeve.*  
 Unio Teyheri. *Menke.*  
 Unio Zimermani. *Stentz. Potier.<sup>2</sup>*  
 Unio ———. *Adams.*

The following species are from the Cretaceous, Tertiary, &c.:—

Unio abbreviatus.<sup>3</sup> *Goldfuss.*  
 Unio abductus. *Phill.*  
 Unio acutus. (*Anthracosta. King.<sup>4</sup>*) *Sow. Flem.*  
 Unio aduncus. *Sow. Mart.*  
 Unio agrestis. *Brown.*  
 Unio alaformis. *Brown.*  
 Unio alatoides. *Lea.*  
 Unio Alpinus. *Mathe. Brown.*  
 Unio ambiguus. *Sow.*  
 Unio amygdala. *Brown.*  
 Unio angustatus. *Bronn. Mus. Strasburg.*  
 Unio anodontodes. *Noul.*  
 Unio Ansticei. (*Myacites. Bronn.*) *Sow.*

<sup>1</sup> This name being preoccupied by me, and the name of Morelet being already used by Deshayes, I propose the name of *oblitus* for it.

<sup>2</sup> Deshayes, in Jacquemont's *Voy. to India*, t. xviii. Fig. 3, gives an *Iridina* (new), and the *Unio corrugatus*, *marginalis* and *cæruleus*? without names or descriptions!

In a catalogue of fresh water and land shells, Ferussac says that a *Unio* (species uncertain) was found in Berg River near the Cape of Good Hope.

<sup>3</sup> M. De Koninek, *Foss. de Carb. de Belgique*, has made a new genus (*Cardinia*) in which he places *abbreviatus*, *robustus*, *carbonarius*, *antiquus*, *subconstrictus*, *uniformis*, *acutus*, *atratus*, *phaseolus*, and *tellinarius*. Pictet, in *Traité Palæontologie*, says he has never found the family anterior to the Wealden, v. iii. p. 528.

<sup>4</sup> Mr. King formed this genus in 1844, for the Uniones of the Coal Formation. It is supposed there are forty species known.

- Unio antiquior. *Strickland.*  
 Unio antiquus. *Sow. Mart. Darreut.*  
 Unio antistrophodonta. *Lamo. Bronn.*  
 Unio Aquensis. *Math.*  
 Unio aquilina. *Sow.*  
 Unio atavus. *Partch. Bronn.*  
 Unio atratus. *Goldfuss.*  
 Unio Austenii. *Forbes.*  
 Unio Batavus. *Pfeif. Bronn.*  
 Unio Bosquinianus. *Mathe. Bronn.*  
 Unio breviplicatus. *Noul.*  
 Unio carbonarius. *Bronn.*  
 Unio cariosoides. *Lea.*  
 Unio Carteri. *Hislop.*  
 Unio centralis. *Bronn.*  
 Unio compressus. *Sow. Mant.*  
 Unio concentricus. *Goldf. Bronn.*  
 Unio concinnus. *Sow. Flem.*  
 Unio convexus.<sup>1</sup> *Rocm. Bronn.*  
 Unio cordiformis. *Sow. Mant.*  
 Unio Cornuelianus. *D'Orb.*  
 Unio costatus. *Goldf.*  
 Unio crassissimus.<sup>2</sup> *Sow. Flem.*  
 Unio crassiusculus. *Sow. Flem.*  
 Unio Cuvieri. *Mathe. Bronn.*  
 Unio cyreniformis.<sup>3</sup> *Desh.*  
 Unio Danai. *Meek & Hayden.*  
 Unio Deccannensis. *Sow. Bronn.*  
 Unio depressus. *Sow.*  
 Unio Deweyanus. *Meek & Hayden.*  
 Unio diluvii. *D'Orb.*  
 Unio distortis. *Bean.*  
 Unio dolobratus. *Sow.*  
 Unio Draparnaldi. *Desh.*  
 Unio edentulus. *Braun. Bronn.*  
 Unio Eichwaldianus. *Keyser. Bronn.*  
 Unio elongatus. *Fisch. Bronn.*  
 Unio Embletoni. *Brown.*  
 Unio Eseri.<sup>4</sup> *Krauss.*  
 Unio exoletus. *Brown.*  
 Unio flabellatus. *Goldf. Bronn.*  
 Unio flabellifer. *Noul.*  
 Unio Galloprovincialis. *Mathe. Bronn.*  
 Unio Gardannensis. *Mathe. Bronn.*  
 Unio Gibbsii. *Forbes.*  
 Unio grandis. *Held. Bronn.*  
 Unio granosus. *S. Wood.*  
 Unio Gualterii. *Fitton.*  
 Unio Haydeni. *Meek.*  
 Unio Hubbardii. *Gabb.*  
 Unio humerosoides. *Lea.*  
 Unio Hunteri. *Hislop.*  
 Unio hybridus. *Sow. Flem.*  
 Unio imbricatus. *Hislop.*  
 Unio incerta. *M. de Serr.*  
 Unio incurvus. *S. Wood.*  
 Unio Kirchbergensis.<sup>4</sup> *Krauss.*  
 Unio Lacazcana. *Dup.*  
 Unio laevis. *Eichw. Bronn.*  
 Unio Lartetii. *Noul.*  
 Unio lateralis. *Brown.*  
 Unio latiplicatus. *Noul.*  
 Unio Lavateri. *Goldf. Bronn.*  
 Unio Laymontianus. *Noul.*  
 Unio Levedensis. *Brown.*  
 Unio liasinus. *Schüb.*  
 Unio ligamentoides. *Lea.*  
 Unio Listeri. *Sow. Flem.*  
 Unio littoralis. *Drap. Bronn.*  
 Unio Malcolmsonii. *Hislop.*  
 Unio mamillatus. *Hislop.*  
 Unio Mandelslohi. *Dunk.*  
 Unio Mantellii. *Fitton.*  
 Unio margaritiferus. *Hörn. Bronn.*  
 Unio Martinii. *Fitton.*  
 Unio Menkei. *Koch.*  
 Unio minutus. *Pusch. Bronn.*  
 Unio modiolaris. *Sow.*  
 Unio Moldaviensis. *Hörn.*  
 Unio Moravicus. *Hörn.*  
 Unio nana. *I. Wood.*  
 Unio nasutoides. *Lea.*

<sup>1</sup> Referred to by Deshayes, *Trait. Elém.*, vol. ii. p. 215.

<sup>2</sup> This name was preoccupied by Ferussac, but his *U. crassissimus* is *U. crassus*, Retz., and, therefore, Sowerby's name must stand.

<sup>3</sup> Deshayes, *Trait. Elém.*, vol. ii. p. 215, proposes this name for *tumidus*, *Sow.*, the latter being preoccupied by Retzius.

<sup>4</sup> Die Mollusken Tertiär-Formation von Kirchberg.

- Unio Nilssoni. *Koch.*  
 Unio nucalis. *Meek & Hay.*  
 Unio nuciformis. *Hibb.*  
 Unio Oriovacensis. *Hörn.*  
 Unio orthonotus. *Con.*  
 Unio ovalis. (*Anthracosia, King.*) *Turton.*  
 Unio paradoxus. *Fisch. Bronn.*  
 Unio parallelus. *Sow.*  
 Unio penultimus. *Gabb.*  
 Unio peregrinus. *Phill.*  
 Unio petrosus. *Mort.*  
 Unio phaseolus. *Sow.*  
 Unio Phillipsii. *Williams. Bronn.*  
 Unio Pianensis. *S. Wood.*  
 Unio pictorum. *Lam.*  
 Unio pinguis. *Sand.*  
 Unio planus. *Römer. Bronn.*  
 Unio porrectus. *Sow. Mant.*  
 Unio primigenius. *Con.*  
 Unio priscus. *Meek & Hayden.*  
 Unio problematius. *Klip. Bronn.*  
 Unio radiatoides. *Lea.*  
 Unio Roanokoides. *Lea.*  
 Unio robustus. *Sow.*  
 Unio Romeri. *Dunk. Bronn.*  
 Unio rostratus. *S. Wood.*  
 Unio Rouxii. *Noul.*  
 Unio saxulum. *Mort.*  
 Unio Slavonicus. *Hörn.*  
 Unio Solandri. *Sow. Flem.*  
 Unio splendens. *Goldf. Bronn.*  
 Unio Staffinensis. *Forbes.*  
 Unio striatus. *Goldf. Bronn.*  
 Unio Stricklandii. *Phill.*  
 Unio strictiplicatus. *Noul.*  
 Unio Sturi. *Hörn.*  
 Unio subeonstrietus. (*Anthracosia, King.*)  
*Sow. Flem.*  
 Unio subporrectus. *Römer. Bronn.*  
 Unio subrotundoides. *Lea.*  
 Unio subrugosus. *Mathe. Bronn.*  
 Unio subsinuatus. *Koch.*  
 Unio subspatulatus. *Meek & Hayden.*  
 Unio subtetragonus. *S. Wood.*  
 Unio subtriangularis. *Brown.*  
 Unio subtrigonus. *Desh. Bronn.*  
 Unio subtruneatus. *Fitton.*  
 Unio subtumidus.<sup>1</sup> *D'Orb.*  
 Unio sulcatus. *Eichw. Bronn.*  
 Unio suprajurensis. *Römer. Bronn.*  
 Unio tellinarius. *Goldfuss.*  
 Unio terrenus. *Mort.*  
 Unio Toulouzanii. *Mathe. Bronn.*  
 Unio transversalis. *M. de Serr.*  
 Unio transversus. *Brown.*  
 Unio trigonus.<sup>2</sup> *Römer. Koch.*  
 Unio truneatosa. *Mich.*  
 Unio tumidus. *Sow.*  
 Unio tumulatis. *Mort.*  
 Unio turgida (*Carbonicola*). *M' Coy.*  
 Unio umbonatus. *Fisch. Bronn.*  
 Unio uniformis. *Sow. Flem.*  
 Unio Urii. *Flem.*  
 Unio Valdensis. *Mantell.*  
 Unio ventricosus. *Bouil. Bronn.*  
 Unio Veræ-Paeis. *Tristram.*  
 Unio vetusta. *Meek.*  
 Unio Voltzii. *Koch.*  
 Unio Vukontinovicii. *Hörn.*  
 Unio Walteri. *Mant. Bronn.*  
 Unio Wetzeleri. *Dunk.*<sup>3</sup>  
 Unio Zelebori. *Hörn.*  
 Unio ———. *Sow.*<sup>4</sup>

Deshayes, *Trait. Elém.*, vol. ii. p. 215, says M. Noulet found, in the Middle Tertiary of the Sub-Pyrenean basin, nineteen species of fossil *Uniones*; but he does not give their names, nor the work of M. Noulet.

<sup>1</sup> D'Orbigny's *Prod. Palæonto.*, vol. ii. p. 306, substitutes *subtumidus* for *tumidus*, Sow., it being pre-occupied.

<sup>2</sup> *U. trigonus* was described by Römer in *Nord. Ool.* 1836. I published my *trigonus* in *Trans. Am. Phil.* 1831, and therefore have precedence.

<sup>3</sup> In Pictet, *Traité*, vol. iii. p. 529.

<sup>4</sup> Referred to by figure in *Mag. Nat. Hist.*, vol. ii. p. 647. It has the form of *littoralis*, and is found at "Gray's."



IV. SUBGENUS MARGARITANA.<sup>1</sup>

NON-SYMPHYNOTE MARGARITANÆ.	PLICATE.	TRIANGULAR.	NON-SYMPHYNOTE MARGARITANÆ.	PLICATE.	OBLONG.
		*complanata. Bar. Lea. Alas. complanata. Bar. Hild. Sow. Symph. complanata. Lea. Sh. & Eat. Unio complanata. Desh. Han. Mya complanata. Eat.			*marginatus. Reeve. Han. Mya regulosa. Wood. Han. Mya rugosa. Eat. Alas. corrugata. Dekay. Vignouana. Bern.
NON-SYMPHYNOTE MARGARITANÆ.	PLICATE.	QUADRATE.	NON-SYMPHYNOTE MARGARITANÆ.	SULCATE.	*rugosa. <sup>4</sup> Lea. Kirtl. Alas. rugosa. Bar. Sh. & Eat. Hild. Adams. Dekay. Alas. abducta. Say. Complanaria rugosa. Swains. Stimpson. (Agass. MSS.) Unio rugosus. Chenu. Han.
		TRIANGULAR.			OBLONG.
		*arcula. Lea. Alasmodonta arcula. Chenu. Han.			
NON-SYMPHYNOTE MARGARITANÆ.	PLICATE.	OBLONG.	NON-SYMPHYNOTE MARGARITANÆ.	SMOOTH.	TRIANGULAR.
		*marginata. Say. Lea. Alas. marginata. <sup>2</sup> Say. Bar. Gould. Migh. Lins. Dekay. Stimp. Alas. truncata. <sup>3</sup> Say. Unio cariosa. (Var. 2.) Lam. Unio varicosa. Lam. Unio calceolus. Say, not of Lea.			*deltoidea. Lea. Alasmodonta deltoidea. Chenu. Han.
					*minor. Lea. Alasmodonta minor. Chenu.

<sup>1</sup> 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. Mr. Gray, in his *Genera*, adopts *Margaritana*, but he cites *Baphia*, Gevers, in 1787. H. and A. Adams, in *Genera of Rec. Mol.*, give *Baphia* preference, and cite Menehen, in *Museum Geversianum*, 1787, as having priority, which I think is correct; and they make the following subgenera—*Alasmodonta*, Say, *Complanaria*, Swain., *Calceola*, Swain.

<sup>2</sup> This species has a very wide geographical distribution. In the St. Lawrence and in the Northern States, it is of ordinary size as it is in the Middle States; but in Ohio it is found large and thick, and very perfectly developed. In South Carolina, Georgia, and Tennessee, it is smaller; and in Kansas, in Verdigris River, it is very much like those in Pennsylvania.

<sup>3</sup> Several specimens of fine *marginata* have been sent to me from the west, marked *Alas. truncata*. Say, being one of his unpublished names, but specimens 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 color in the exterior.

<sup>4</sup> I found the oviducts of *M. rugosa* fully charged on the 20th May.

NON-SYMPHYNOTE MARGARITANÆ.	SMOOTH.	TRIANGULAR.	NON-SYMPHYNOTE MARGARITANÆ.	SMOOTH.	OVAL.
		*Curreyana. <i>Lea.</i>			*elliptica. <i>Lea.</i>
		*undulata. <i>Say. Lea.</i>			*Georgiana. <i>Lea.</i>
		<i>Unio undulata. Jay. Han.</i>			<i>M. Etowahensis. Lea.</i>
		<i>Alas. undulata. Say. Bar. Swain.</i>			<i>Alasmodonta impressa. Anth.</i>
		<i>Gould. Küst. Adams. Linsl.</i>			
		<i>Dekay. Migh.</i>			
		<i>Alas. sculptilis (junior). Say.</i>			radiata. <sup>2</sup> <i>Con. Lea.</i>
		<i>Strophitus sculptilis. Stimpson.</i>			<i>Alas. radiata. Con.</i>
		(Agass. MSS.)			<i>Unio radiata. Han.</i>
<i>Mya undulata. Wood.</i>					
<i>Unio hians. Valen.</i>	Pfeifferiana. <i>Bern.</i>				
<i>Unio glabratus. Sow.</i>					
<i>Uniopsis radiata. Swain.</i>					
*triangulata. <i>Lea.</i>	*calceola. <sup>3</sup> <i>Lea. Kirtl.</i>				
	<i>Unio calceolus. Lea. Han. Desh.</i>				
	<i>Chenu.</i>				
	<i>Unio triqueter. Sh. &amp; Eat.</i>				
OVAL.	<i>Alas. marginata.<sup>4</sup> Say.</i>				
*Tombigbéensis. <i>Lea.</i>	<i>Alas. truncata. Con., not of Say.</i>				
	<i>Calceola angulata. Swain.</i>				
*Raveneliana. <sup>1</sup> <i>Lea.</i>	OBLONG.				
<i>Alasmodonta Raveneliana. Chenu.</i>	*Alabamensis. <i>Lea.</i>				
<i>Unio Swanaoensis. Han.</i>					
*Elliottii. <i>Lea.</i>	*quadrata. <i>Lea.</i>				

<sup>1</sup> It has been supposed that this might be the *Alas. marginata*, Say, but in a specimen received from Prof. Troost, and returned to him, I found the beaks to differ essentially, the undulations being small and numerous at the tip. It differs also in the teeth and other characters.

<sup>2</sup> This shell, in the teeth, except in the size of them, very closely resembles the *Alas. edentula*, Say—*An. areolatus*, Swain. 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 from that genus. An examination of the animals, when satisfactorily dissected, may show the necessity of placing them both, notwithstanding their possessing small cardinal teeth, with the *Anodontæ*. Swainson, in his *Malacology*, refers to *radiata* as his *Uniopsis radiata*; but this must be an error. I think his shell is a thick var. of *Marg. undulata*, such as comes from Canada.

<sup>3</sup> In my Memoir in the *Trans. Am. Phil. Soc.*, vol. iii. p. 420 (p. 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*.

<sup>4</sup> Mr. Say, in his *Synonymy*, makes *calceolus* and *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.

NON-SYMPHYNOTE MARGARITANÆ.

WIDE.

- \*Hildrethiana.<sup>1</sup> *Lea.*  
*Unio Hildrethianus.* *Lea.*  
*Al. ambigua?* *Say.*
- \*dehiscens.<sup>2</sup> *Say.* *Lea.*  
*Unio dehiscens.* *Say.* *Desh.* *Han.*  
*Unio oriens.* *Lea.*

OBOVATE.

- \*Connasaugaensis. *Lea.*
- \*Spillmanii. *Lea.*

ARCUATE.

- \*margaritifera.<sup>3</sup> *Lin.* *Lea.* *Cooper.*<sup>4</sup>  
*Mya margaritifera.* *Lin.* *Mil.*  
*Born.* *Schröt.* *Pennant.* *Don.*  
*Chem.* *Knorr.* *Da Costa.* *Dill.*  
*Desh.* *Wood.* *Mat.* *Monta.*  
*Mühl.* *Nil.* *Schreib.* *Cuv.*  
*Rossm.* *Dup.* *Eat.* *Chenu.* *Moq.*  
— *crassissima.* *Klein.*  
*Margaritana fluviatilis.*<sup>5</sup> *Schum.*  
*Margaritana arcuata.* *Stimpson.*  
*Margaritana (Unio) Mongolicus.*  
*Midd.*

ARCUATE.

- Unio elongata.* *Lam.* *Mich.* *Bouil.*  
*Nils.* *Puton.* *Potier.* *Dup.*  
*Merm.* *Gras.*
- Unio sinuata.* *Stud.* *Pfeif.*
- Unio Roissyi.* *Mich.* *Desh.* *Gras.*
- Unio margaritiferus.* *Retz.* *Speng.*  
*Pfeif.* *Cuv.* *Drap.* *Bosc.* *Turt.*  
*Gaertner.*<sup>6</sup> *Menke.* *Waard.* *Rossm.*  
*Dup.* *Bouil.* *Alder.* *Gras.* *Han.*  
*Unio margaritifer.* *Graells.* *Schrenk.*  
*Midd.*
- Unio rivalis.* *Zieg.*
- Unio Carolinianus.*<sup>7</sup> *Bosc.*
- Unio Dahuricus.* *Midd.* *Gerst.*
- Alas. margaritiferum.* *Flem.* *Brown.*  
*Macgil.*
- Alas. margaritiferus.* *Thompson.*  
*Forbes.*
- Alas. elongatus.* *Thompson.*
- Alas. arcuata.* *Bar.* *Gould.* *Adams.*  
*Migh.* *Linsl.* *Dekay.*
- Mya arcuata.* *Eat.*
- Alas. falcata.* *Gould.*
- Alas. Yubaensis.* *Trask.*

<sup>1</sup> In the previous editions, this was placed among the *Uniones* with much hesitation. I now think it groups better with the *Margaritanae*. Its cardinal tooth is very much like *M. Bonellii*, and the callus of the dorsal margin is sometimes, in both, so much thickened as to present an imperfect appearance of a lateral tooth. Mr. Say's description of *ambigua* answers well to *Hildrethiana*, 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.

<sup>2</sup> Mr. Say, in his *Synonymy*, gives Mr. Rafinesque's name of *lata* precedence. Mr. Eaton says that *An. lata*, Raf., is *Symphynota tenuissima*, Lea.

<sup>3</sup> Klein describes this species under the name of *crassissima*, but with no generic term. This name has been, by Ferussac and other zoologists, erroneously applied to the large *Unio*, common to the south of Europe, which Retzius described as *Unio crassus*, and I have given it to Retzius. Klein's *crassissima* is the true *Margaritana margaritifera* (*Mya margaritifera*, Lin.), and his figure of it, Pl. x. Fig. 47, is a copy of Lister's, Tab. 149, Fig. 4.

<sup>4</sup> Judge Cooper states, under the authority of Dr. Cooper, that the Indians east of Cascade Mountains eat this species.

<sup>5</sup> I adopt Schumacher's generic name because he has priority; but I discard his specific name of *fluviatilis* because he changed, without any reason, the long and well-established specific name of *margaritifera*.

<sup>6</sup> Fide Menke.

<sup>7</sup> I have been, and am still, perplexed about this species of Bose. M. Ferussac considers it the same with *Unio obesus* (nobis), and I so stated it in my second edition. Recently, I have had access to Bose's description and figure (*Hist. Nat. des Coquilles*), which agree better with *Margaritana margaritifera* than any other species; and he refers to the figure of it in *Ency. Meth.*

NON-SYMPL. MARGAR.	{	SMOOTH.	ARCUATE.
			<i>Alas. complanatus</i> . <sup>1</sup> <i>Müll.</i>
			* <i>Holstonia</i> . <i>Lea.</i>
			<i>Unio Holstonianus</i> . <i>Han.</i>
			* <i>fabula</i> . <i>Lea.</i>
			<i>Unio fabula</i> . <i>Han.</i>

The following species are unknown to me:—

*Alasmodonta Tripolitana*. *Fer.*  
*Alasmodonta incurva*. *Fer.*  
*Margaritana Etowaensis*. *Con.*  
*Margaritana Wetzleri* (*fossil*). *Dunk.*  
*Krauss*.<sup>2</sup>  
*Alasmodonta* ———. *Con.*<sup>3</sup>  
*Alasmodonta* (*Unio*) *Stuarti*. *Ad. & Ang.*

<sup>1</sup> Middendorff *Sibi*, Reise, p. 273, refers to *Unio complanatus*, Soland., for this species.

<sup>2</sup> Die Mollusken der Tertiär-Formation von Kirchberg.

<sup>3</sup> Proc. Acad. N. S., vol. vii. p. 32. The description is at length, but there is no specific name given! Loc. unknown.

V. SUBGENUS PLAGIODON.<sup>1</sup>

NON-SYMPHIL. PLAGIODON.	{	{	SUBROTUND. *isocardioides. <i>Lea. H. Adams.</i>	
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<sup>1</sup> Proposed by me, *Proc. Acad. Nat. Sci.*, vol. viii. p. 79, and *Jl. Acad. Nat. Sci.*, vol. iii., N. S., p. 319, and *Obs. on the Genus Unio*, vol. vi.

VI. SUBGENUS MONOCONDYLÆA.<sup>1</sup>

SYMPH. MONOCOND.	{	PLICATE.	OVATE.		NON-SYMPHYNOTE MONOCONDYLÆÆ.	{	SMOOTH.	OVATE.
			* <i>crebristriata</i> . <i>Anth. Blan.</i> <i>Trigonodon crebristriata</i> . <i>Con.</i>					<i>Unio Sauleyi</i> . <i>Bourg.</i> <sup>4</sup> <i>Unio Mechonii</i> . <i>Bourg.</i> <i>Unio Tripolitanus?</i> <i>Bourg.</i>
NON-SYMPH. MONOCOND.	{	SMOOTH.	OBOVATE.		NON-SYMPHYNOTE MONOCONDYLÆÆ.	{	SMOOTH.	OBLONG.
			<i>Salmeniana</i> . <i>Gould. Blan.</i> <i>Anod. Salweniana</i> . <i>Gould.</i> <sup>2</sup>					* <i>Wheatleyi</i> . <i>Lea.</i>
NON-SYMPH. MONOCOND.	{	SMOOTH.	QUADRATE.		NON-SYMPHYNOTE MONOCONDYLÆÆ.	{	SMOOTH.	SUBROTUND.
			* <i>rhomboidea</i> . <sup>3</sup> <i>Lea.</i> <i>Unio Euphraticus?</i> <i>Bourg.</i> <i>Unio Opperti?</i> <i>Monge. Bourg.</i> <i>Unio Churchillianus</i> . <i>Bourg.</i>					* <i>Franciscana</i> . <i>Mori.</i>  * <i>lentiformis</i> . <i>Lea.</i>  * <i>reticulata</i> . <i>Mori.</i>  <i>costulata</i> . <i>Mori.</i>
NON-SYMPH. MONOCOND.	{	SMOOTH.	<i>Cambodjensis</i> . <i>Petit.</i>		NON-SYMPHYNOTE MONOCONDYLÆÆ.	{	SMOOTH.	WIDE.
			OVATE.					* <i>Bonellii</i> . <sup>5</sup> <i>Fer.</i>
NON-SYMPH. MONOCOND.	{	SMOOTH.	<i>Sauleyi</i> . <i>Bourg. Lea.</i>		NON-SYMPHYNOTE MONOCONDYLÆÆ.	{	SMOOTH.	

<sup>1</sup> D'Orbigny, the distinguished traveller in South America, formed the genus *Monocondylæa* for a group of shells which he first observed, and which possess a single cardinal tooth and no lamellar one. This tooth certainly differs from that of the *Margaritana*, Schum. (*Alasmodonta*, Say). I am indebted to the great kindness of M. D'Orbigny for his species. The shell figured by Spix, Pl. 25, Figs. 1 and 2, under the name of *Aplodon inerme*, but not described in the text, evidently belongs to D'Orbigny's genus *Monocondylæa*. It is certainly a most interesting group, and it is to be regretted that we have no description of the soft parts. There seem to be three natural sub-groups in *Monocondylæa*. 1. *Franciscana*, *Paraguayana*, *Parshappii*, *Corrientesensis*, and *Guayrayana* have the large tooth in the left valve anterior to the large one in the right valve. 2. *Vondembuschiana* has the reverse of this, as is also the case with *inoscularis*, Gould. These two are from the East Indies, while the former are all South American. 3. The *fossiculifera* differs distinctly from both these forms. The dorsal line is not bent into a curve by the teeth, but is indented in each valve, the fosset being fitted by a corresponding projection on the opposed valve. This I propose to call *Fossula*. When the soft parts of the different species shall be examined, these proposed divisions may be sustained, and the group will consist of *Monocondylæa*, D'Orbigny, *Pseudodon*, Gould, and *Fossula*, Lea.

<sup>2</sup> Dr. Gould described this shell in the *Proc. Bost. Soc. Nat. Hist.*, Dec. 6, 1843, and proposed a sub-genus (*Pseudodon*) for it. The hinge margin is formed exactly like my *Monocondylæa Vondembuschiana*, and I have therefore placed it in that genus.

<sup>3</sup> I am disposed to think, judging from M. Bourguignat's figures, that my *rhomboidea* and his *Euphraticus*, *Opperti*, and *Churchillianus* are all the same. If so, he must have preference.

<sup>4</sup> M. Bourguignat, in *Voy. Mer. Mort* by Sauley, describes this shell as having no lateral teeth, and the figure evidently shows it belongs to the genus *Monocondylæa*. It is from Jaffa.

<sup>5</sup> In a letter from the Abbé Stabile, Milan, Jan. 1861, he tells me that *Anodonta Uniopsis*, Lam., is only a small thin variety of *Alasmodonta Bonellii*, Fer. If *Uniopsis* and *Bonellii* be the same, then the former has the preference, and the latter is a synonym.

NON-SYMPHYNOTE MONOCONDYLÆÆ.

SMOOTH.	WIDE.
	<i>Alas. Bonellii.</i> Fer.
	<i>Alas. depressa?</i> Villa.
	<i>Alas. compressa.</i> Menke. Villa.
	<i>Margari. Bonellii.</i> Villa.
	<i>Unio Bonellii.</i> Han.
	<i>Unio depressa.</i> Pfeif. Mühl.
	* <i>Mouhotiana.</i> Lea.
	* <i>compressa.</i> Lea.
	OBOVATE.
* <i>Paraguayana.</i> D'Orb.	
<i>Unio Paraguayana.</i> Han.	
* <i>Pazii.</i> Lea.	
* <i>Parchappii.</i> D'Orb. Schom.	
<i>Unio Parchappii.</i> Han.	
* <i>Corrientesensis.</i> D'Orb.	
<i>Unio Corrientesensis.</i> Han.	
* <i>Guarayana.</i> D'Orb. Chenu. Hupé.	
<i>Unio Guarayana.</i> Han.	
* <i>fossiculifera.</i> D'Orb.	
<i>Unio fossiculiferus.</i> Han.	

NON-SYMPHYNOTE MONOCONDYLÆÆ.

SMOOTH.	OBOVATE.
	* <i>Peguensis.</i> Anth. Blan.
	* <i>Vondembuschiana.</i> Lea.
	<i>Margari. Zollingeri.</i> Mousson. <sup>1</sup>
	<i>Margari. crispata.</i> Mousson.
	<i>Margari. fragilis.</i> Mousson.
	* <i>Cumingii.</i> Lea.
	<i>Anod. Cumingii.</i> Lea.
	<i>Pseudodon ellipticum.</i> Con.
	* <i>planulata.</i> <sup>2</sup> Lea.
* <i>inoscularis.</i> Gould. Blan.	
<i>An. inoscularis.</i> Gould.	
<i>Minuana.</i> D'Orb. <sup>3</sup>	
<i>Unio Minuana.</i> Han.	
ARCUATE.	
<i>Mardinensis.</i> Lea.	
<i>Leguminaia Mardinensis.</i> Con.	
SPECIES UNKNOWN TO ME.	
<i>Mon. orbicularis.</i> More.	
<i>Mon. Tamsiana.</i> Dunk.	
<i>Mon. tumidus.</i> More.	
<i>Mon. exilis.</i> More.	

<sup>1</sup> Menke and Pfeif, in *Zeits. fur Malak.*, say that these three shells are the same as *Margaritana (Monocondylæa) Vondembuschiana*, Lea.

<sup>2</sup> Young of *Vondembuschiana*?

<sup>3</sup> The figure of *Minuana* is so nearly like to that of *Paraguayana* that it is likely to prove merely a variety.

VII. SUBGENUS DIPSAS.<sup>1</sup>

SYMPHYNOTE DIPSASES.	{	TRIANGULAR. *plicatus. <sup>2</sup> Leach. <i>Barbala plicata.</i> <sup>3</sup> Humph. <i>Myt. plicatus.</i> Soland. <i>Myt. dubius.</i> Gmel. Dill. <i>Cristaria tuberculata.</i> Schum. <i>An. dipsas.</i> Fer. <i>An. exotica.</i> Blain. <i>An. tuberculatus.</i> Fer. <i>An. alatus.</i> Sow. <i>An. Herculeæ.</i> <sup>4</sup> Midd. Gerst. <i>An. bellua.</i> More. <i>Symph. bi-alata.</i> <sup>5</sup> Lea.	}	SYMPHYNOTE DIPSASES.	{	TRIANGULAR. <i>Barbala bi-alata.</i> Chenu. <i>Unio bi-alata.</i> Desh. Reeve. Han. <i>Dianisolis Chinensis.</i> Raf.
		OVAL. *discoideus. <sup>6</sup> Lea. <i>Symp. discoidea.</i> Lea. <i>Unio discoideus.</i> Reeve. <sup>7</sup> Han. <i>Unio tenuis.</i> Gray. <sup>8</sup> <i>An. tenuis.</i> Gray. <sup>8</sup> Baird & Adams. <i>An. Chinensis.</i> Phil. <i>Barbala discoidea.</i> Chenu.				

<sup>1</sup> Mr. Swainson discards the name of *dipsas*, because it was used by Larentini (1768) for a genus of reptiles, and he says he gladly adopts that of *Symphynota*, Lea (Malac., p. 288). I think it better, however, that the rule recently adopted among most zoologists not to repeat generic names, should be more prospective than retrospective, if adopted at all. Well and long established names are not likely to lead to error. But the name of *Barbala*, Humphreys, has no doubt the pre-eminent title, and should take precedence over all other proposed names, viz., *Barbata*, Sow., *Cristaria*, Schum., *Appius*, Leach, *Dianisotis*, Raf., *Dipsas*, Leach (1815), *Symphynota*, Swain. not Lea, *Dipsax*, Voight, if we allow the names of Humphreys.

<sup>2</sup> 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 (who made the genus in 1815) 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*.

<sup>3</sup> Fide Dr. Gray.

<sup>4</sup> Dr. Dunker, in Cassel, showed me a valve in his collection from Siberia, somewhat fractured, which is undoubtedly the *Dipsas plicatus*, Leach. It is the largest specimen belonging to this family which I have seen: in breadth about 12 inches; length  $7\frac{1}{4}$  inches. See note on *An. gigantea*.

<sup>5</sup> Mr. Rafinesque, in the continuation of his Monograph (p. 7), affirms decidedly that the *Symphynota bi-alata*, Lea, is a peculiar genus, but he changes it to *Dianisolis Chinensis*!!

<sup>6</sup> The posterior termination of the tooth shows some disposition to duplication, and evidently inclines to pass into the subgenus *Unio*.

<sup>7</sup> The figure No. 275 is not *discoideus*, Lea, but probably taken from *U. lævissimus*, Lea.

<sup>8</sup> In Griffith's Cuvier.



VIII. SUBGENUS ANODONTA.<sup>1</sup>

SYMPHYNOTE ANODONTÆ.	SMOOTH.	TRIANGULAR.	SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.
		*Wahlamatisensis. <i>Lea. Cooper. Han.</i> <i>An. triangularis. Trask.</i> <i>An. rotundovata. Trask.</i> <i>trigona. Spix. Hupé. Han.</i>			<i>Symp. Benedictensis. Lea.</i> <i>An. cultrata. Gould.</i>
		OVAL.			*Nuttalliana. <i>Lea. Han.</i>
		*magnifica. <sup>2</sup> <i>Lea. Han.</i> <i>Symp. magnifica. Lea. Chenu.</i> <i>An. rotundatus. Swain.</i> <i>An. aurata. Küst.</i> <i>An. magnifica. Schrenck.<sup>3</sup></i>			*Californiensis. <i>Lea.</i>
		*Woodiana. <i>Lea. Han.</i> <i>Symp. Woodiana. Lea.</i>			SUBROTUND.
		*Benedictii. <i>Lea. Adams. Dekay.</i> <i>Stimpson. Han.</i>			*rubicunda. <i>Lea.</i>
			NON-SYMPH. ANODON.	PLICATE.	OBOVATE.
					*crispata. <sup>4</sup> <i>Lam. Han.</i> <i>An. glauca. Gould.<sup>5</sup></i> <i>An. puberula. Gould.</i>
					*tortilis. <i>Lea.</i>

<sup>1</sup> As Bruguière first separated this group from *Unio*, and called it *Anodontites*, it ought to be at least mentioned if his name be not adopted. *Anodonta* is now so universally used that it might be doubted if it should be changed. Bruguière published in *Ency. Math.* in 1792. Poli, in his great work, subsequently reunites *Unio* and *Anodonta*. H. and A. Adams give the following subgenera: *Symphynota*, Lea, *Lamproscarpha*, Swain., *Patularia*, Swain.

<sup>2</sup> Dr. Gray, in Griffith's Cuvier, Pl. 24, Fig. 2, gives a figure, without description, of a shell, under the name of *Unio tenuis*, which he thinks is my *An. magnifica*; but it appears to me to be my *Dipsas discoidea*. It is figured with the linear tooth of *Dipsas*.

<sup>3</sup> The figure given by Dr. Schrenck in *Reisen und Forschungen im Amur-Lande* is not my *magnifica*. I therefore propose to call it *Schrenckii*.

<sup>4</sup> With some hesitation, I have placed this and *tortilis* under the division plicate, as the folds or crimples are so small as almost to require a lens. But to place them in the division of "smooth" shells would be, I think, more objectionable.

<sup>5</sup> In letter of April 7, 1855, Dr. Gould says he has changed *glauca* (being preoccupied) to *puberula*, and that it belongs to *Monocondylæa*, O'Orb.

NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.
	<p>*<i>cygnea</i>.<sup>1</sup> <i>Drap. Lam. Mill. Crouch. Blain. Pfeif. Turt. Des Moul. Flem. Grat. Bouil. Brard. Bose. Children. Puton. Potier. Gassies. Por. Klees. Morelet. Merm. Forb. and Hanl. Villa. Guerin. Graells. Thompson. Cuv. Gray. Küst. Brown. Bouch. Rossm. Desh. Studer. Menke. Gras. Goupil. Dup. Fitz. Swain. Schrenck. Charp. Waard. Kickx. Midd.<sup>2</sup> Gras. Stein. Chenu. Brot. Bourg. Han. Moq. Caill.</i></p> <p><i>Myt. cygneus. Lin. Chem. Schrö. Dill. Mühl. Monta. Mat.<sup>3</sup> Shep. Tur. Müll. Schreib. Pennant. Don. Da Costa.</i></p> <p><i>Myt. anatinus. Lin. Chem. Schrö. Schum. Wood. Monta. Don. Da Costa. Penn. Shep. Tur. Dill. Mat. Schreib. Grat.</i></p> <p><i>Myt. stagnalis. Gmel. Dill. Sow. Schreib.</i></p> <p><i>Myt. fluviatilis.<sup>4</sup> Gmel. Schreib.</i></p>	<p><i>Myt. fucatus. Dill.</i></p> <p><i>Myt. Zellensis. Gmel. Schrö. Schreib.</i></p> <p><i>Myt. Avonensis. Monta. Wood. Ed. Encyclopædia. Moq.</i></p> <p><i>Myt. radiatus.<sup>5</sup> Müll. Schrö. Schreib.</i></p> <p><i>Myt. incrassatus. Shep.</i></p> <p><i>Myt. maculata. Shep.</i></p> <p>— <i>fragilis. Klein.</i></p> <p><i>Musculus fluviatilis. Klein.</i></p> <p><i>Musculus latus. List. Klein.</i></p> <p><i>Musculus angustior. Klein.</i></p> <p><i>Grand Moule des étangs. Geoff.</i></p> <p><i>An. anatina. Lam. Cuv. Mill. Dill. Bose. Drap. Sow. Pfeif. Flem. Grat. Des Moul. Stud. Bouil. Macgil. Phil. Menke. Desh. More. Goup. Nils. Put. Küst. Dup. Ald. Graells. Villa. Klees. Por. Gass. Bouch. Pot. Charp. Drouet. Waard. Fitz. Arada. Midden.<sup>6</sup> Gerst. Brot. Bourg. Han. Moq. Caill.</i></p> <p><i>An. sulcata. Lam. Nils. Vill.</i></p> <p><i>An. dentiens. Menke.</i></p>			

<sup>1</sup> I have, after a good deal of consideration and examination of my specimens, and the figures in the numerous works describing the *Unionidæ*, satisfied myself that *An. cygnea* and *An. anatina* are not specifically distinct. If the observation of M. Poiret, that the first is viviparous 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." M. Gras (*Description des Moll. Fluv. et Ter. de la France*) says that *anatinus* is only the young of *cygneus*; and Dr. Gray says, in his *Manual of Fresh Water and Land Shells*, that it is a most variable species, and that "we must not only dissent to the division of this polymorphous bivalve into these numerous species, into which it has been separated by the continental writers, but even demur to the possibility of arranging the diversities of shape and coloring into strictly different varieties." "Like *Unio*, this genus is chiefly American, only one distinctly-marked species inhabiting Europe." Such has been my opinion for more than twenty years. (See note on *Unio pictorum*.)

<sup>2</sup> Middendorff (*Sibi. Reise*) refers to his Pl. 21, Figs. 4 and 5; Pl. 22, Figs. 1 and 2; and Pl. 26, Figs. 1 and 2, for *An. cygnea*, but Figs. 1 and 2 on Pl. 22 are undoubtedly *Dipsas plicatus*, Leach.

<sup>3</sup>  $\beta$  of Maton and Racket (*Lin. Soc. Trans.*, vol. iv.) is evidently, judging from the figure, *Unio litoralis*.

<sup>4</sup> 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 Say's *cataracta* is the same, no doubt.

<sup>5</sup> Fide Dillwyn.

<sup>6</sup> Tunguska River, Siberia.

## OVAL.

- An. intermedia.* Lam. Pfeif. Nilss.  
 Waard. Fitz. Charp. Bouil.  
 Menke. Desh. Bouch. Dup. Pot.  
*An. variabilis.* (Var. b.) Drap.  
 Vill. Moq.  
*An. cellensis.* Pfeif. Menke. Rossm.  
 More. Küst. Bosc. Dup. Vill.  
 Mous. Brot. Grat. Midden.<sup>1</sup>  
 Waard. Fitz. Gerst. Bourg.  
*An. ventricosa.* Pfeif. Menke. Bouch.  
 Vill. Pot. Dup. Küst. Waard.  
 Kickx. Midd. Brot. Grat.  
*An. ponderosa.*<sup>2</sup> Pfeif. Menke. Pot.  
 Por. Dup. Rossm. Küst. Held.  
 Graells. Waard. Drouet. Kickx.  
 Midd. Grat. Caill.  
*An. paludosus.* Tur.  
*An. stagnalis.* Bosc.<sup>3</sup>  
*An. fluviatilis.* Bosc.  
*An. grossa.* Zieg.  
*An. obvolvata.* Zieg.  
*An. complanata.* Zieg. Rossm.  
 Menke. Küst. Drouet. Fitz.  
 Midd. Moq.  
*An. rhomboidea.* Schlut. Rossm.  
*An. spuria.*<sup>4</sup>  
*An. proboscidalis.* Zieg.  
*An. piscinalis.* Nil. Gass. Pot.  
 Grat. Dup. Küst. Rossm. Vill.  
 Drouet. Midd. Stab. Caill. Bourg.  
 Brot.  
*An. rostrata.* Kokiell. Rossm. Dup.  
 Held. Küst. Vill. Drouet. Bourg.  
*An. attenuata.* Held.<sup>5</sup>  
*An. limpida.* Zieg.  
*An. exulcerata.* Vill. Por.  
*An. Klettii.* Rossm.

## OVAL.

- An. convexa.* Dup.  
*An. Rossmassleriana.* Dup. Drouet.  
 Grat.  
*An. Rossmassleri.* Kinb. Drouet.  
*An. Parreyssii.* Kinb. Drouet.  
*An. regularis.* More.  
*An. maculenta.* More.  
*An. Lusitania.* More.  
*An. ranarum.* More.  
*An. coarctata.* Mich. Pot.  
*An. minima.* Pot. Mill. Grat.  
*An. Grateloupiana.* Gass. Grat.  
 Caill.  
*An. ovalis.* Requier. Pot.  
*An. Dupuyi.* Ray and Drouet. Dup.  
*An. arelatensis.* Jacq. Dup. Caill.  
*An. Milletii.* Ray and Drouet. Dup.  
 Grat.  
*An. Normandi.* Dup. Grat.  
*An. oblonga.* Stentz. Mill. Dup.  
 Zieg. Drouet. Bourg.  
*An. Rayii.* Dup. Grat.  
*An. subponderosa.* Dup. Grat.  
*An. Scaldiana.* Dup. Drouet. Grat.  
*An. Moulinsiana.* Dup. Drouet.  
 Grat.  
*An. subrhomboidea.* Brown.  
*An. contorta.* Brown.  
*An. luxata.* Held. Küst.  
*An. callosa.* Küst.  
*An. inornata.* Küst.  
*An. cariosa.* Küst.  
*An. arealis.* Küst.  
*An. subluxata.* Küst.  
*An. Sondermanii.* Küst.  
*An. anserirostris.* Küst.  
*An. tenella.* Küst.

<sup>1</sup> Var. *Beringiana*, Kamtschatka.

<sup>2</sup> This and *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* ought to be considered a distinct species, and such may prove to be the fact, but I doubt it much.

<sup>3</sup> I presume that Bosc meant the same variety as *Myt. fluviatilis*, Gmel. But he refers to Lister's Pl. 157, which is probably *Unio cariosus*, Say. Bosc refers to Europe for the habitat of his species, and certainly there is no species in Europe like Lister's figure.

<sup>4</sup> Count Yoldi's letter to me.

<sup>5</sup> He since considers it a variety of *cellensis*, Pfeif.

NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.
		<p><i>An. tumida.</i> Fitz. Küst.  <i>An. confervigera.</i> Schluter.  <i>An. rhomboïdea.</i> Schluter.  <i>An. parvula.</i> Drouet.  <i>An. subalata.</i> Zieg.  <i>An. assimilis.</i> Zieg.  <i>An. vetula.</i> Zieg.  <i>An. deplanata.</i> Zieg.  <i>An. nitida.</i> Zieg.  <i>An. prolongata.</i> Zieg.  <i>An. derassa.</i> Zieg.  <i>An. excentrica.</i> Zieg.  <i>An. spreta.</i> Zieg.  <i>An. fuscata.</i> Zieg.  <i>An. latissima.</i> Kok.  <i>An. depressa.</i> Schmidt.  <i>An. subdepressa.</i> Drouet.  <i>An. minuta.</i> Drouet.  <i>An. corrosa.</i> Drouet.  <i>An. Dalmatina.</i> Drouet.  <i>An. truncata.</i> Drouet.  <i>An. crassa.</i> Fitz.  <i>An. opalina.</i> Küst.  <i>An. Sedakowii.</i> Siesm.  <i>An. Beringiana.</i> Midd.  <i>An. Middendorfi.</i> Siesm.  <i>An. Gougetana.</i> Ogerien.  <i>An. arenaria.</i> Bourg.  <i>An. psammita.</i> Bourg.  <i>An. Helvetica.</i> Bourg.  <i>An. anatinella.</i> Stab.  <i>An. contracta.</i> Stab.  <i>An. Pictetiana.</i> Dum. Brot.  <i>An. melina.</i> Bourg.  <i>An. arenaria.</i> H. &amp; A. Adams.  <i>Anodontites cygnea.</i> Poir.  <i>Anodontites anatina.</i> Poir.</p> <p>micans. Anth.</p>			<p>*Danielsii. Lea.    *Gesnerii. Lea.    *Hallenbeckii. Lea.    *Leonensis. Lea.    *Oregonensis. Lea. Cooper. Han.  <i>An. cognata.</i> Gould.    *Simpsoniana. Lea.    Lucasii. Desh. More.<sup>1</sup>    *Pepiniana. Lea.    *Kennicottii. Lea.    *Dallasiana. Lea.    *fragilis. Lam. Han.  <i>An. pallida.</i><sup>2</sup> Anth.  <i>An. imbricata.</i> Anth.  <i>An. flava.</i> Anth.  <i>An. glandulosa.</i> Anth.  <i>An. irisans.</i> Anth.  <i>An. subcarinata.</i> Currier.    *Footiana. Lea.  <i>An. McNielii.</i> Anth.    uniopsis.<sup>3</sup> Lam. Han.  <i>Unio uniopsis.</i> Desh.  <i>Alas. compressa.</i> Por.</p>

<sup>1</sup> The outline is very much like *an. cygnea*, Lam. The figure (*Exp. Sci. de l'Algeria Moll.*, Pl. 108) represents a heavy shell like the var. *ponderosa*.

<sup>2</sup> *Pallida*, *imbricata*, *flava*, *glandulosa*, and *irisans* are all forms which I have had in my cabinet for many years, and unless the soft parts should be found to differ, I should still consider them variations of *fragilis*, Lam., attributable to different habitats and local effects.

<sup>3</sup> This is supposed to be the same with *Mono. Bonellii*. See note, p. 72.

NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	<p>           OVAL.            *Chaiziana.<sup>1</sup> Rang.  <i>Epigenia decorata</i>. Parr.              *undulata. Say. Hild.<sup>2</sup> Sh. &amp; Eat.            Gould. Adams. Linsl. Han.  <i>Anodon rugosus</i>. Swain.  <i>Anodonta Pennsylvanica</i>. Lam.  <i>Unio undulata</i>. Desh.  <i>Alas. marginata</i>. Küst.  <i>Strophitus undulatus</i>. Stimp.              Strebellii. Lea.              *Showalterii. Lea.              *Wardiana. Lea.  <i>A. virgata</i>. Con.              *edentula. Lea. Dekay. Han.  <i>Alas. edentula</i>. Say.  <i>Alas. rhombica</i>. Anth.  <i>An. areolata</i>. Swain. Coop. Linsl.  <i>An. unadilla</i>. Dekay.  <i>Hemiodon areolatus</i>. Swains.              *pavonia. Lea. Dekay. Han.         </p>	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	<p>           OVAL.            Weddellii. Hupé.              obtusula. Hupé.              lingulata. Hupé.              *limnoica. D'Orb. Han.              *Holtonis. Lea.              purpurea.<sup>3</sup> Valen. Han.              *Ferussaciana. Lea. Dekay. Han.  <i>Alas. Ferussaciana</i>. Küst.              *Kennerlyi. Lea.              *modesta. Lea.              *denigrata. Lea.              *oblita. Lea.              *plicata. Hall.              *argentea. Lea.         </p>
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<sup>1</sup> M. Rang informed me that this species has the singular power of maintaining its vitality in the desiccated marshes of Africa, through six months of the burning sun of that region; and that he had a specimen sent to him in Paris, which was killed nearly thirteen months after it had been taken from its native bed, having occasionally been dipped in water for an hour or two only. He also mentions that the *Iridina rubens* is found with the *Chaiziana* in the Senegal, and possesses the same peculiarities of remaining in a state of torpidity during the season of great heat. A specimen, under the name of *Chaiziana*, sent to Dr. Jay from Europe, and given to me by him, is, I think, a young *Iridina rubens*. Dr. Vandembusch, of Bremen, sent me, more recently, a thicker and more inflated specimen under the name *Epigenia decorata*, of Parreyss and other Vienna naturalists. This appears to me to be the female of the same species. I think it possible that *An. Chaiziana*, *An. Tawaii*, and *E. decorata* may all prove to be identical, varying by geographical position, sexual difference, or age. I have had very strong doubts whether this be not a young *Iridina rubens*, but the two specimens I have seem to be mature, and Rang describes and figures his *Chaiziana* without siphons. The lesser of the two anterior cicatrices is smaller in my two specimens, and more elongate, than in *rubens*.

<sup>2</sup> I doubt very much if Dr. Hildreth had Mr. Say's *undulata* under his eye when he made his description. The *undulata* of Say does not exist west of the Alleghany Mountains, and Dr. Hildreth probably had some other species, which, not being figured and the description being imperfect, I cannot make out. The species is said to be found in Onocida Lake and Lake Champlain.

<sup>3</sup> Von Martens (*Malac. Blatt.* 1867) considers the following to be synonyms: *An. Boroughiana*, Lea; *U. Bengalensis*, Lea; *U. verecundus*, Gould; *An. subcrassa*, Lea; *An. tenuis*, Lea; *An. crepera*, Lea; *An. gracilis*, Lea. He is certainly mistaken in most of these at least.

NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OVAL.
	<p>*ferruginea. <i>Lea.</i></p> <p>*salmonia. <i>Lea. Han.</i></p> <p>*imbecillis. <i>Say. Adams.</i>  <i>An. incerta. Lea. Küst. Han.</i>  <i>An. horda.<sup>1</sup> Gould.</i></p> <p>*implicata. <i>Say. Gould. Linsl. Migh.</i>  <i>Dekay. Stimp.</i>  <i>An. Newtonensis. Lea. Han.</i>  <i>An. Housatonica. Lind. Gould.</i>  <i>Stimp.</i>  <i>An. excurvata. Dekay.</i></p> <p>*Dunlapiana. <i>Lea.</i></p> <p>*fluviatilis. <i>Dill. Lea. Gould. Adams.</i>  <i>Linsl. Dekay. Han.</i>  <i>Myt. fluviatilis.<sup>2</sup> Dill., not Gmel.</i>  <i>Wood.</i>  <i>Myt. illitus. Soland.?</i>  <i>Myt. marginatus. Eat.</i>  <i>An. cataracta. Say. Sow. Küst.</i>  <i>Migh. Desh.<sup>3</sup></i>  <i>An. marginata. Say. Adams?</i>  <i>Linsl. Migh. Stimp.</i>  <i>An. teres. Con.</i>  <i>Unio cataracta. Desh.</i></p> <p>*Tryonii. <i>Lea.</i></p> <p>*virgulata. <i>Lea.</i></p> <p>*Lewisii. <i>Lea.</i></p>	<p>*lacustris. <i>Lea.</i></p> <p>*Dariensis. <i>Lea.</i></p> <p>*opaca. <i>Lea.</i></p> <p>*crepera. <i>Lea.</i></p> <p>*Arkansensis. <i>Lea.</i></p> <p>reticulata. <i>Reeve.<sup>4</sup></i></p> <p>dactylus. <i>Sow.</i></p> <p>*Mortoniana.<sup>5</sup> <i>Lea. Hupé. Han.</i>  <i>An. Chiquitana. D'Orb.</i>  <i>Craspedodonta smaragdina? Anton.</i>  <i>Küst.</i></p> <p>*Napoensis. <i>Lea.</i></p> <p>*Wymanii. <i>Lea.</i></p> <p>*glauca.<sup>6</sup> <i>Valen.</i>  <i>An. glauca. Lam.</i>  <i>An. ovatus. Swain.</i></p> <p>*ovata. <i>Lea. Han.</i>  <i>An. subangulata. Anth.</i></p> <p>*Youkanensis. <i>Lea.</i></p> <p>*plana. <i>Lea. Dekay. Han.</i>  <i>An. declivis. Con.</i></p>			

<sup>1</sup> I have several times had specimens from Texas, and have no doubt of its being Say's *imbecillis*, which has such an extraordinarily wide geographical distribution in the Southern and Western States.

<sup>2</sup> See note on *An. cygnea*.

<sup>3</sup> *Trait. Elem.*, vol. ii. p. 218.

<sup>4</sup> Mr. Reeve (*Conch. Icon.*, No. 27) gives this as being Dr. Gould's species. But I am not aware of his having described an *Anodonta* under this name. The figure is so closely like *Arkansensis*, Lea, that I should not be surprised if it be the same, and coming from North America.

<sup>5</sup> D'Orbigny gives *An. trigonum*, Spix., as a synonym.

<sup>6</sup> 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.	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OBLONG.
		*decora. <i>Lea. Han.</i> <i>An. inornata. Anth.</i>			doliaris. <i>Lea.</i>
		*papyracea. <sup>1</sup> <i>Anth.</i>			*Jewettii. <i>Lea.</i>
		*Granadensis. <i>Lea.</i>			*tetragona. <i>Lea.</i>
		*Harpethensis. <i>Lea.</i>			*Trautwiniana. <i>Lea.</i>
		*gigantea. <sup>2</sup> <i>Lea. Han.</i>			*Shafferiana. <i>Lea.</i>
		*subvexa. <i>Con.</i>			*Williamsii. <i>Lea.</i>
		*Stewartiana. <i>Lea.</i>			*Bealei. <i>Lea.</i>
		subglobosa. <i>Anth.</i>			*Bridgesii. <i>Lea.</i>
		Vescoiana. <i>Bourg.</i>			*Henryana. <i>Lea.</i>
		*virens. <i>Lea.</i>			*suberassa. <i>Lea.</i>
		*gibbosa. <i>Say.</i> <i>An. inflata. Major Le Conte's Cabinet.</i>			*Forbesiana. <i>Lea.</i>
		*Couperiana. <i>Lea.</i>			*Moricandii. <i>Lea.</i>
		*Burroughiana. <i>Lea.</i>			SUBROTUND.
		puelchana. <i>D'Orb. Mart.</i>			*suborbiculata. <i>Say. Han.</i>
		*grandis. <i>Say. Lesueur.</i>			gibba. <i>Benson. Reeve.</i>
		*corpulenta. <i>Coop.</i>			*globosa. <i>Lea.</i>
		Napolatensis. <i>Sow.</i>			*Linnaeana. <i>Lea.</i>
		*Texasensis. <i>Lea.</i>			*Pazii. <i>Lea.</i>
					*lenticularis. <i>Lea.</i>
	rotunda. <i>Spix.</i>				
	*Cailliaudii. <i>Lea.</i>				

<sup>1</sup> Mr. Anthony sent me this species in 1859 with the habitat of Tennessee. I recognized it as a new and interesting species, with an imperfect cardinal tooth. In the description, *Am. Jl. Conch.*, 1865, he says "habitat"?

<sup>2</sup> *An. giganteus*, Spix., having been before described by Lamarek under the name of *trapezialis* and *exotica*, my species must retain this name.

NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	WIDE.	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	WIDE.
		*Marryatana. <i>Lea.</i> <i>An. subinflata.</i> <i>Anth.</i>			*Schröteriana. <i>Lea. Hupé.</i>
		elongata. <i>Swain. Han.</i>			OBOVATE.
		*ensiformis. <i>Spix. D'Orb. Schom.</i> <i>Küst. H. &amp; A. Adams. Han.</i> <i>Lamproscapha ensiformis.</i> <i>Chenu.</i>			*obtusa. <i>Spix. Küst. Mori. Hupé.</i> <i>An. lituratum.</i> <i>Spix.</i>
		*cylindræca. <i>Lea. Han.</i>			Montezuma. <i>Lea.</i>
		*subcylindræca. <i>Lea. Linsl. Dekay.</i> <i>Stimp. Han.</i>			*trigona. <sup>2</sup> <i>Spix. D'Orb. Küst.</i>
		lucida. <i>D'Orb.</i>			*sirionos. <sup>3</sup> <i>D'Orb. Hupé. Mart.</i> <i>An. Ferrarisi.</i> <i>D'Orb.</i>
		*Buchanensis. <i>Lea. Han.</i>			*Patagonica. <i>Lam. Küst. Mart.</i>
		*Senegalensis. <i>Lea.</i>			*lato-marginata. <sup>4</sup> <i>Lea. D'Orb. Von</i> <i>Mar.</i> <i>An. trapezeus?</i> <sup>5</sup> <i>Spix.</i> <i>An. exotica?</i> <i>Cuv.</i> <i>An. membranæca.</i> <sup>6</sup> <i>D'Orb. Hupé.</i> <i>Patularia rotunda.</i> <i>Swain.</i> <i>Patularia lato-marginata.</i> <i>Chenu.</i>
		*Dahomeycnsis. <i>Lea.</i>			*Spixii. <i>D'Orb.</i> <i>An. rotundus.</i> <i>Spix. Küst.</i> <i>An. trapezium.</i> <i>Mori.</i>
		*gracilis. <i>Lea.</i>			porcifer. <sup>7</sup> <i>Gray.</i>
		*Wheatleyi. <i>Lea. H. Adams.</i>			*trapezialis. <i>Lam. Blain. Pot. Küst.</i> <i>Hupé. Mart.</i>
		*Amazonensis. <i>Lea.</i>			
		*exilis. <sup>1</sup> <i>Lea. Han.</i> <i>An. polita.</i> <i>Mouss.</i> <i>An. siliqua.</i> <i>Küst.</i>			

<sup>1</sup> Prof. Kirtland informed me that he received this shell from Wallingford, Conn., taken from some of the branches of the Quinipiak River, but I think this must be an error. When I described it, I mentioned having purchased it of Mr. Warren, a dealer in Boston, who could give me no idea whence it came. I never supposed it to be an American species, and my conclusion is justified, I think, by having received the same species from Dr. Vondembusch, of Bremen, he having procured it from Java.

<sup>2</sup> Férussac considered *trigona* the same as *crassa*, Swainson. The two figures, however, appear to me to be too different to be considered the same.

<sup>3</sup> The specimen sent to me by M. D'Orbigny under the name of *sirionos* does not correspond with his figure in *Voy. Am. Mer.*, Pl. 74, Figs. 4-6, and Pl. 80, Figs. 1 and 3, which I think are drawn from a *lato-marginata*, Lea; but it is, I think, the same as *trigona*, Spix.

<sup>4</sup> The *Patagonica* and *lato-marginata*, when they are better observed, may prove to be the same.

<sup>5</sup> 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.

<sup>6</sup> See note 4, p. 55.

<sup>7</sup> Never having seen this species, I place it here on Dr. Gray's authority. *Pro. Zool. Soc.* 1834, p. 58.



NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OBOVATE.	NON-SYMPHYNOTE ANODONTÆ.	SMOOTH.	OBOVATE.
		<i>An. exotica</i> . <sup>1</sup> Lam. Cuv. <sup>2</sup> D'Orb.			<i>Gonidea</i> <sup>5</sup> Randalli. Con.
		<i>Desh. Hupé. Von Mar. Han.</i>			<i>Gonidea feminalis.</i> Con.
		<i>An. giganteus. Spix. Menke. Küst.</i>			* <i>tenebricosa.</i> Lea. D'Orb. Han.
		<i>An. pencillatus?</i> Gray.			<i>Lamproseapha tenebricosa.</i> Chenu.
		<i>An. Susannæ.</i> Gray.			<i>An. tenebrosa.</i> Reeve. <sup>6</sup>
		<i>An. trapezia.</i> Küst.			* <i>tenuis.</i> Lea.
		<i>An. ciconia.</i> Gould.			* <i>luteola.</i> Lea.
		<i>An. Blainvillianus.</i> Reeve.			* <i>inæquivalva.</i> Lea.
		<i>An. subsinuata?</i> Sow.			ARCUATE.
		* <i>anserina.</i> Spix. Han.			<i>solidula.</i> Deville and Hupé.
		* <i>radiatus.</i> Spix.			* <i>arcuata.</i> Fer.
		<i>Georginæ.</i> <sup>3</sup> Gray.			<i>arcuta.</i> Caill. <sup>7</sup>
		<i>Leila Georgina.</i> Hupé.			<i>Pallegoixi.</i> Cuming. Reeve.
		* <i>Uruguayensis.</i> Lea.			<i>sinuosa.</i> Lam. Swain. Han. Dupuy?
<i>crassa.</i> Swain. Han.	<i>solenidea.</i> Sow.				
<i>Leotandi.</i> Guppy.	* <i>soleniformis.</i> D'Orb.				
* <i>angulata.</i> <sup>4</sup> Lea. Hinds. Cooper. Han.					
<i>Patularia angulata.</i> Chenu.					
<i>An. feminalis.</i> Gould.					
<i>An. Randalli.</i> Trask.					

<sup>1</sup> So far as I have been enabled to examine specimens of this and *trapezialis*, I am disposed to think they are not distinct species.

<sup>2</sup> The figure, Pl. 90, given in the edition of Cuvier by his pupils, is said to be reduced to one-half. It seems to me to be a good representation of *An. lato-marginata* (nobis), and not like Lamarek's *exotica*.

<sup>3</sup> I have not seen this shell. It seems to be nearly allied to *Blainvilliania* (nobis), judging from the figure in Griffith's Cuvier, Pl. 19, Fig. 3. It is from Paraguay.

<sup>4</sup> This very curious and interesting species was described from a single imperfect valve, brought by Mr. Nuttall from Oregon. Some years afterwards, Lady Catherine Douglas recognized it among the shells sent by Sir George Simpson, from Vancouver, and to her I owe the possession of a fine and perfect specimen. In the collection of the Exploring Expedition, I recognized many fine specimens which Captain Wilkes brought from Columbia River. Some of them my friend Dr. Gould has since characterized as a distinct species, but in this I should not agree with him. Mr. Hinds found this species abundant in the Rio Sacramento, California, where he says it was used as food by the Indians.

<sup>5</sup> I do not see any reason for proposing a new genus for this shell. If the irregular dorsal margin required its being removed from *Anodonta*, then it should be placed in D'Orbigny's genus *Monocondylea*.

<sup>6</sup> Mr. Reeve quotes Say for *tenebrosa*, but Mr. Say described no *Anodonta* by that name to my knowledge. It is evidently my *tenebricosa* from South America.

<sup>7</sup> The figure of Cailliaud, *Voy. à Meroé*, vol. ii., Pl. 61, is exactly like a specimen sent to me many years since under the name of *arcuata*, Fer., from the Nile.

The following species are unknown to me:—

An. anatinoides. *Klein. Brown.*  
 An. annulatus.<sup>1</sup> *Sow.*  
 An. attenuata. *Stab.*  
 An. atrovirens. *Phili. Shutt.*<sup>2</sup>  
 An. Bambousearum. *Morelet.*  
 An. Benaensis. *Vill.*  
 An. Bengalensis. *Reeve.*  
 An. Burroughiana. *Chenu.*<sup>3</sup>  
 An. eallifera. *Mart.*  
 An. canescens. *Stentz.*  
 An. eapitata. *Küst.*  
 An. earinifera. *Con.*<sup>4</sup>  
 An. earinata. *Dunk.*  
 An. Charpentierii. *Küst.*  
 An. Chinensis. *Fer.*  
 An. cimbula. *Vill.*  
 An. coaretata. *Anton.*  
 An. eornea. *Phili.*  
 An. (Unio) crepera.<sup>5</sup> *Reeve.*  
 An. euneata. *Küst.*  
 An. curvatus. *Fer.*  
 An. elachista. *Bourg.*  
 An. embia. *Bourg.*  
 An. exotica. *Reeve.*  
 An. folium. *Fer.*  
 An. fragilis. *Fitz.*  
 An. gigantea.<sup>6</sup> *Middendorff.*  
 An. glabra. *Zeig. Vill.*  
 An. Guilliani. *Recluz.*  
 An. Harlandi. *Baird & Ad.*  
 An. Heldii. *Küst.*  
 An. Idrina. *Spin. Bourg.*  
 An. impura. *Say.*

An. incarum. *Phili.*  
 An. Jobæ. *Dupuy.*  
 An. Kellestii. *Sow.*  
 An. Latoureuvi. *Bourg.*  
 An. leprosa. *Parr. Vill.*  
 An. Lucasii. *More.*  
 An. lugubris. *Say.*  
 An. lurulentus. *More.*  
 An. Niaragua. *Phili.*  
 An. Nilssoni. *Küst.*  
 An. normalis. *Stabile.*  
 An. Numidia. *Bourg.*  
 An. Ononensis.<sup>7</sup> *Lea.*  
 An. opilina. *Küst.*  
 An. palustris. *Fer. et D'Orb.*  
 An. Pietetianus. *Dum.*  
 An. pictus. *Swain.*  
 An. plicata. *Hall.*  
 An. polymorpha. *Küst.*  
 An. recurvirostra. *Küst.*  
 An. rugifera. *Dunk.*  
 An. Schombergkii. *Mart.*  
 An. smaragdina. *Anton.*  
 An. subreniformis. *Sow.*  
 An. subrostrata. *Phili.*  
 An. subsinuata. *Phili.*  
 An. Swinhoei. *H. Adams.*  
 An. Tawaii. *Rang.*  
 An. triangularis. *Trask.*  
 An. triangularis. *Lanza.*  
 An. triangularis. *Vill.*  
 An. triangulata. *Küst.*  
 An. truneata. *Küst.*  
 An. Tunizana. *More.*  
 An. Ucayalensis. *Phili.*

<sup>1</sup> Very like *pavonia*, Lea.

<sup>2</sup> Probably *cygnea*, Lin.

<sup>3</sup> Livr. 81, Pl. 3, Fig. 3. This name and figure are placed to two different species in this plate.

<sup>4</sup> On cover of *Monog.* No. 9.

<sup>5</sup> This is not *crepera*, Lea, as supposed by Mr. Reeve.

<sup>6</sup> A specimen of this shell from the River Onon, Northern Siberia, was presented to the Boston Soc. Nat. Hist. by Dr. Gould. It is stated to be "11 inches long and 6½ high." (Proceedings, March, 1849.) I presume this is a distinct species, but, without a description or view, I am unable to determine. The name, however (*gigantea*), is preoccupied, and I propose to substitute *Ononensis*, as the author's name (*Middendorffii*, Siesm.) is also preoccupied. Is it not possible that this may be an old *Dipsas plicatus*, Leach, with the teeth obliterated?

<sup>7</sup> See note above.

*Fossil Species.*

An. Abyssina. <i>Morton.</i>	An. cygnea. <i>Morris's Cat. Bronn.</i>
An. anatinoides. <i>Klein. Krauss.<sup>1</sup> Bronn.</i>	An. Daubreana. <i>Schimper.</i>
An. antiqua. <i>D'Orb.</i>	An. grandioides. <i>Lea.</i>
An. aquensis. <i>Mathe. Bronn.</i>	An. Jukesii. <i>Forbes.<sup>2</sup></i>
An. Cordieri. <i>D'Orb.</i>	An. obliquius. <i>D'Orb. Bronn.</i>
An. corpulentoides. <i>Lea.</i>	An. Purbeckensis. <i>Forbes.</i>
	An. tener. <i>Eichw. Bronn.</i>
	An. tenuissima. <i>Eichw. Bronn.</i>

<sup>1</sup> Die Moll. der Tertiär-Formation von Kirchberg.<sup>2</sup> From the Devonian of Ireland.

IX. SUBGENUS COLUMBA.<sup>1</sup>

NON-SYMPHYNOTE COLUMBÆ.	SMOOTH.	OBOVATE.	NON-SYMPHYNOTE COLUMBÆ.	SMOOTH.	OBOVATE.
		*Blainvilliana. <sup>2</sup> <i>Lea.</i>			<i>Leila Parishii.</i> <i>Gray.</i>
		<i>An. Blainvilliana.</i> <i>Lea. Chenu.</i>			
		<i>Hupé. Han.</i>			*esula. <sup>5</sup> <i>Jan.</i>
		<i>An. trapezialis.</i> <i>Crouch.</i>			<i>Anodonta esula.</i> <i>Jan.</i>
		<i>An. Parishii.</i> <sup>3</sup> <i>Gray. Han.</i>			<i>Irid. esula.</i> <sup>6</sup> <i>D'Orb.</i>
		<i>An. hians.</i> <i>Sow. Reeve.</i>			<i>Leila esula.</i> <sup>7</sup> <i>Gray. Hupé.</i>
		<i>An. scriptus.</i> <i>Fer. Reeve.</i>			<i>Leila Castelnaudii.</i> <i>Hupé. Mart.</i>
		<i>Leila pulvinata.</i> <i>Hupé.</i>			

<sup>1</sup> Testa æquivalvis, inæquilatera, subtriangulari. Cardo linearis edentulus. Impressio muscularis pallii postica inflecta.

<sup>2</sup> In my description of *Blainvilliana* (*Observations on the Genus Unio*, vol. i. p. 189), I observed that I was induced to believe that the animal of this shell would be found to differ from that of the genus *Anodonta*. M. D'Orbigny, in his *Synopsis of the Fresh Water Shells of South America*, has in fact so found it. The animal has two tubes. Nevertheless, although I then proposed, if such should be the case, that it should be placed in a new genus, under the name of *Columba*, I continued it in the subgenus *Anodonta*, as, with the artificial system, which is founded on the hinge, I thought it could not with propriety be elsewhere classed. I then mentioned that when the family shall be arranged in a system founded on the animal structure only, it evidently must be changed, and I doubted then if it should be placed in the genus *Iridina*, for, although it is likely that all the species of that genus have two tubes, they do not seem to possess the inflected palleal cicatrix, which I noted in the description of *Blainvilliana*. There being now at least two distinct species known, I have thought it best to classify the genus *Columba* as proposed March 15th, 1833 (*Obs.* vol. i. p. 190).

<sup>3</sup> In a letter from Dr. Gray, Nov. 1834, he states that his *Parishii* and my *Blainvilliana* are the same. His paper is dated July 8th, 1834; mine, March 15th, 1833.

<sup>4</sup> M. D'Orbigny, at p. 43, *Synopsis Ter. and Fluv. Mollusque*, makes *An. trapezialis*, Lam., a synonym to his *Iridina trapezialis*; but I think that Lamarek's *An. trapezialis* is a different shell. I cannot but think that D'Orbigny's *I. trapezialis* is my *An. Blainvilliana*.

<sup>5</sup> M. D'Orbigny thinks that this is my *Blainvilliana*, but, having his specimens and mine of both these species, I am induced still to believe that I am correct. The two specimens resemble each other, but are certainly distinct. The inflected palleal cicatrix exists in both, but the *esula* is more curved, and the dorsal margin is more sinuous, the nacre being bluish white, while the five or six specimens of *Blainvilliana* which I have seen are all salmon color.

<sup>6</sup> *Mag. de Zool.*, 1835.

<sup>7</sup> Gray's *Genera*.

X. SUBGENUS BYSSANODONTA.<sup>1</sup>

SMOOTH.	QUADRATE. Paranensis. <i>D'Orb. Chenu.</i>
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<sup>1</sup> This is a remarkable fresh water bivalve discovered by M. D'Orbigny, remaining always attached by a *byssus*. See *Voy. dans l'Amér. Mérid.*

GENUS PLATIRIS.<sup>1</sup>I. SUBGENUS IRIDINA.<sup>2</sup>

NON-SYMPHYNOTE IRIDINÆ.	SMOOTH.	OBLONG.	Spekii. <sup>3</sup> Woodward.	NON-SYMPH. IRID.	SMOOTH.	ARCUATE.	*exotica. Lam. Desh. <sup>5</sup> Pot. Chenu.
		OBOVATE.	*ovata. Swain. Woodward. <i>Irid. exotica.</i> Children. <i>Irid. splendida.</i> Chenu. <i>Pleiodon Macmurtriei.</i> Con. <i>Pleiodon ovata.</i> Con. Chenu.				<i>Irid. striata.</i> Swain. Woodward. <i>Irid. elongata.</i> Sow.
		*Leaii. <sup>4</sup> Sow.					<i>Species Unknown to me.</i>
							<i>Iridina valeus.</i> <sup>6</sup> Parr. <i>Iridina solida.</i> Anton. <i>Iridina Welwitschii.</i> More.

<sup>1</sup> Genus *Platiris* (nobis), πλατις, latus; ιρις, iris. *Testâ æquivalvis, latè transversâ; impressiones musculares grandes; cardo longus, linearis; ligamentum externum.*

<sup>2</sup> When Lamarck established his genus *Iridina*, he had seen but a single species, and of that only one individual, which is figured in the *Encyclop. Méthodique*, Pl. 204. Other species have been since referred to his genus, which do not seem to me to fulfil the conditions of his generic diagnosis. The phrase "cardo per longitudinem tuberculosus, subcrenatus," is by no means descriptive of the hinge belonging to the species just alluded to, which has the hinge smooth, or very slightly tuberculate. The figure in the *Encyclopédie*, and that of Blainville (Pl. 66, Fig. 3), represent the same individual, and exhibit a character of hinge resembling in some measure that of an *Arca*. A second species, apparently agreeing with Lamarck's generic description, has been observed and described by Swainson, under the name of *Iridina ovata* (*Phil. Mag.*, vol. lxi.); and it has also been described by Mr. Children under the name of *I. exotica* (*Brande's Journ.*, vol. xv.). The specimen described in *Brande's Journal* is now in the British Museum, and that accurate naturalist, Dr. John Edward Gray, who is one of the officers of that noble institution, informs me that he thinks it is identical with the shell upon which Mr. Conrad has lately proposed to form a new genus, *Pleiodon*. Under these circumstances, it seems to me necessary to separate those shells having a *crenulated* hinge (which are true *Iridinæ*), from those having the hinge *smooth*, or very *slightly tuberculated*. I therefore arrange the *Iridina rubens*, *Nilotica*, &c., in a new subgenus, for which I propose the name of *Spatha*. In an intemperate note by Mr. Conrad, on the cover of No. 11 of his *Monography*, he says that I refer *P. Macmurtriei* to *Iridina ovata*, because Dr. Gray *thinks* them identical; and further says this "must be a wilful error" on my part! But this irritable remark cannot alter the fact. *It is identical*. Mr. Swainson (*Malacology*, p. 286) says "the name of *Pleiodon* cannot be substituted for that of *Iridina*, as applied to the typical species."

Ferussac says that Humphrey, in his Catalogue (MSS.?), made a genus (*Scapha*) for an *Iridina*, and that the "*mutel*, D'Adanson," is certainly the same (*Mém. de l'Hist. Nat. de Paris*, v. i. p. 362).

<sup>3</sup> This has so much the characteristic of *ovata* that I should not be surprised if it proved eventually to be a well-marked variety of that species.

<sup>4</sup> Mr. Sowerby very kindly presented me with a specimen under this name. It looks to me like a young *I. ovata*, and I have little doubt but that it will prove to be such.

<sup>5</sup> M. Deshayes gives the *Nilotica* as a synonym to this species, but I think it is distinct.

<sup>6</sup> From Africa, in *Jay's Cat.*

II. SUBGENUS SPATHA.<sup>1</sup>

SYMPH. SPATHÆ.	SULCATE.	TRIANGULAR.	NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	OVAL.
		* <i>alata</i> . <i>Lea</i> .			Wahlbergi. <sup>4</sup> <i>Krauss</i> .
NON-SYMPHYNOTE SPATHÆ.	SULCATE.	OVAL.	NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	WIDE.
		* <i>Nyassaensis</i> . <i>Lea</i> .			* <i>dubia</i> . <i>Gmel</i> . <i>Chenu</i> .
		OBLONG.			<i>Myt. dubius</i> . <i>Gmel</i> . <i>Dill</i> .
NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	* <i>Natalensis</i> . <i>Lea</i> .	<i>Mut. dubia</i> . <i>H. and A. Adams</i> .	<i>Irid. Nilotica</i> . <i>Sow. Fer. Cuv.</i>	
		<i>An. tabula</i> . <i>Sow</i> .	<i>Irid. Nilotica</i> . <i>Sow. Fer. Cuv.</i>	<i>Crouch. Caill. Pot. Desh. Mart.</i>	
		WIDE.	<i>An. dubia?</i> <i>Bosc</i> .	<i>Irid. Oudniei</i> . <i>Koenig</i> .	
NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	* <i>modesta</i> . <i>Lea</i> .	<i>Irid. gracilis</i> . <i>Caill</i> .	<i>Spatha Nilotica</i> . <i>Anton. Küst</i> .	
		OVAL.	<i>Irid. Niloticus</i> . <i>Wood</i> .	<i>Calliscapha Nilotica</i> . <i>Swain. Chenu</i> .	
		* <i>rubens</i> . <sup>2</sup> <i>Lam. Chenu</i> .	<i>Le mutel</i> . <i>Adan</i> .	<i>Myt. Niloticus</i> . <i>Wood</i> .	
NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	<i>Irid. rubens</i> . <i>Desh. Cuv. Rang</i> .	<i>Irid. mutel?</i> <i>Rang</i> .	<i>Irid. angustata</i> . <i>Sow</i> .	
		<i>Irid. arenata?</i> <i>Caill. Pot</i> .	* <i>cælestis</i> . <sup>5</sup> <i>Lea</i> .	<i>Irid. rostrata?</i> <i>Rang. Pot</i> .	
		<i>An. obtusa?</i> <i>Potier and Mich</i> .	<i>Spatha rostrata</i> . <i>Küst</i> .		
NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	<i>An. rubens</i> . <i>Lam. Blain. Menke</i> .			
		<i>Küst</i> .			
		<i>An. Clappertoni</i> . <sup>3</sup> <i>Koenig</i> .			
NON-SYMPHYNOTE SPATHÆ.	SMOOTH.	<i>Spatha Cailliaudi?</i> <i>Mart</i> .			
		<i>Spatha Hartmanni?</i> <i>Mart</i> .			
					<i>Species unknown to me.</i>
					<i>Spatha compressa</i> . <i>Mart</i> .
					<i>Spatha Petersi</i> . <i>Mart</i> .

<sup>1</sup> H. and A. Adams divide the group into *Mutela*, Scopoli, *Scalliscapha*, Swain, *Pleiodon*, Con., *Spatha*, Lea, *Leila*, Gray, *Mutela*, consisting of *dubia*, Gmel., *valeus*, Parr.

<sup>2</sup> Dr. Gray informs me that Cailliaud figures a species near to this from Egypt, which is in his possession, but I have not seen the shell or description. A specimen in Mr. Tanner's collection labelled *Iridina arcuata*, Caill., and sent by M. Cailliaud to the late Mr. Hyde, is an *Anodonta*.

<sup>3</sup> In Denham and Clapperton's Journey.

<sup>4</sup> The figure is very like *rubens*, but Prof. Krauss says it differs ("Südafrikanischen Mollusken"). It comes from Natal, South Africa.

<sup>5</sup> A specimen of *cælestis* received of Dr. Piteairn, from Edinburgh, was marked *Unio longinus*, Gray.

III. SUBGENUS MYCETOPUS.<sup>1</sup>

NON-SYMPHYNOTE MYCETOPI.	FALCATE.	{ WIDE. plicatus. <sup>2</sup> Gray. Reeve.	NON-SYMPHYNOTE MYCETOPI.	SMOOTH.	{ WIDE. *siliquosus. D'Orb. Han. An. siliquosus. Spix. Küst. More. An. longinus. Spix. Myc. subsinuatus. Sow. Reeve. Irid. longina. Fer. Lamproscapha siliquosa. Swain.
	SMOOTH.	{ WIDE. soleniformis. D'Orb. Chenu. Han. Spatha soleniformis. Ant. Küst. Myc. pygmaeus. Hupé. Myc. Weddellii. Hupé.  *emarginatus. <sup>3</sup> Lea. Sow. Reeve.  *falcatus. <sup>4</sup> Higg. & Reeve, No. 9.			{ *pygmaeus. <sup>5</sup> Spix.  rugatus. Sow. Reeve.  ventricosus. <sup>6</sup> D'Orb.

<sup>1</sup> This genus, established by M. D'Orbigny, has the dorsal margin smooth like *Anodonta*; but that and the basal margin are nearly parallel, and the posterior margin is truncate. The soft parts of the animal figured by D'Orbigny represent it to be very different in the form and size of the foot, which it extends enormously. He mentions that the two anterior cicatrices are widely separated. A more important character appears to be in the fact that the smaller cicatrix is placed before the larger one. In *Unio* and *Anodonta*, it is placed below it, and in *Hyria*, Lam., it is placed above, that is, in a line with the beak. Its habits are different from the *Unionidæ* generally, as it buries itself over a foot in the sand, "perforat, sicut pholadæ." In this characteristic it is analogous to *Margaritana dehiscens* (p. 69), *Unio dehiscens*, Say, which my brother, T. G. Lea, informed me he found only at a depth of 12 inches below the surface of the sand on the bars of the River Ohio, their position being ascertained by a small hole at the surface kept open by the animal. The foot is capable of great extension. See description of soft parts, *Obs.* Vol. X. p. 76.

<sup>2</sup> This has very much the appearance of a deformed shell, as figured by Reeve, No. 3.

<sup>3</sup> Mr. Conrad proposes to create a new genus (*Soleniaia*) for this species (*Am. Jl. Conch.*, vol. iv. p. 249), it having, he says, "a lateral tooth in each valve," which it has not, there being then only a "slight long rising," as originally described by me. I presume Mr. Conrad had never seen the shell.

<sup>4</sup> Mr. Higgins has described and figured this species (*Zool. Pro.*, 1868, p. 179), which he received from Mr. E. Bartlett, who discovered it in streams near Chyaretas, Upper Amazon. It is closely allied in all its characters to *emarginatus* (nobis), and I have admitted it above as a distinct species. If the habitats be correct, and I have no reason to doubt them, we have in Mr. Wheatley's collection and mine, together with Mr. Higgins' authority, the two distant habitats well established. *Falcatus* seems to be a smaller species, more emarginate, corrugate on the posterior slope, and the angles of umbonial and anterior slopes are more acute.

<sup>5</sup> Having the two shells *An. siliquosa* and *An. pygmaea*, Spix., before me, I cannot doubt of their being distinct; and I believe they both belong to D'Orbigny's genus *Mycetopus*.

<sup>6</sup> *Voyage dans l'Amérique Méridionale*, tom. v. partie iii. Pl. 72, Fig. 1-3. The figure of *ventricosus* approaches so much that of *siliquosus*, that I would not be surprised if it should prove to be simply a variety.



IN Mr. 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. In this list, I have not divided the *Unionide* into his numerous genera. The want of adequate figures, and an absence of sufficiently accurate description, together with Mr. Rafinesque's well-known proclivity to make species out of imaginary forms and specimens, induced me, after repeated and vain attempts to recognize his species, to follow the example of Mr. Say, Mr. Barnes, and all the other American malacologists up to the time of commencing my memoirs on this subject, to avoid any further attempt to elucidate a mass of confusion which was considered beyond the pale of science. The views of the late Dr. Binney, in his *Terrestrial Molluscs of the United States*, Prof. A. Gray, in *Amer. Journal of Science*, and Major Le Conte, in the *Proc. Acad. Nat. Sciences*, in relation to the claims of this writer, are so conclusive that it is only necessary for any unprejudiced mind to examine the facts and be perfectly satisfied that Mr. R. has, so far from advancing science by his writings in this branch, been the cause of inextricable confusion, from the embarrassment of which we can only be relieved by altogether avoiding any further attempt to make out his imaginary species. M. Ferussac, who made vain attempts to understand his division and species, says that the shells he sends away augment the difficulties in knowing his own species, and that he had received the same shells under different names, and others with the names evidently different from those given in his monography; that the difficulty, therefore, is inextricable in the determination of his species, &c.

Alasmodonta atropurpureum?	Unio antrosa?	Unio cyclips?
badium?	argyratus?	cyphia?
costata?	atroviolacea?	decorticata?
hians?	attenuata?	depressa?
papyraceum?	aurata?	diaphanus?
ponderosum?	bicolor?	dilatata?
rugosum?	biloba?	diploderma?
scriptum?	bullata?	ellipsaria?
sulcatum?	calendis?	elliptica?
viridis?	cardium?	fasciata?
	castaneus?	fasciola?
	chloris?	fasciolaris?
Anodonta aperta?	cinerescens?	flava?
atra?	Cliffordiana?	flexuosa?
cuneata?	cordata?	flexus?
digonota?	costata?	fontinalis?
inflata?	crassa?	fragilis?
lata?	cuneata?	fulgens?
Ohiensis?	cuprea?	fulvus?
solenoides?		

Unio gibbosa?  
     granulatus?  
     interrupta?  
     lævigata?  
     lamobrachys?  
     lateralis?  
     latissima?  
     leptodon?  
     lineolata?  
     lividus?  
     megaptera?  
     melaplata?  
     montanus?  
     nervosa?  
     nigra?  
     nodulata?  
     obliquata?  
     obovalis?  
     olivaria?  
     ovata?  
     pachostea?

Unio pallens?  
     pallida?  
     paphos?  
     perplexus?  
     plateolus?  
     ponderosus?  
     pusella?  
     quadrula?  
     reflexa?  
     retusa?  
     rimosus?  
     rivularis?  
     rosea?  
     sintoxia?  
     sinuata?  
     solenoides?  
     stegaria?  
     striata?  
     subrotunda?  
     teneltus?

Unio teres?  
     torulosa?  
     triangularis?  
     triqueter?  
     truncata?  
     tuberculata?  
     Venus?  
     verrucosa?  
     viridis?  
     vittatus?  
     zonalis?

Odatelia radiata?

Lasmonos fragilis?

Diplasma marginatæ?  
     similis?  
     striata?  
     vitrea?

# GEOGRAPHICAL DISTRIBUTION

OF THE

## SPECIES OF THE FAMILY NAIADES.

To render the preceding Synoptical Arrangement more complete, it was deemed advisable to make such a table as would throw together the species from each great division of the world; and, to make this more useful, it has been thrown into alphabetic arrangement.

### GENUS MARGARON.

#### I. SUBGENUS TRIQUETRA.

##### SOUTH AMERICA.

Brownianus. *Lea.* River Amazon.  
corrugata. *Lea.* River Amazon.  
subviridis. *Klein.* River Amazon.

##### ASIA.

contorta. *Lea.* Pei-ho river, China.

#### II. SUBGENUS PRISODON.

##### SOUTH AMERICA.

truncatus. *Schum.* River Amazon.  
Dupreyi. (Unio.) *Recluz.* Rio Parana.  
nodulosus (Mya), *Wood.* Hab. doubtful.

#### III. SUBGENUS UNIO.

##### EUROPE.

Batavus. *Lam.* Various rivers.  
crassus. *Retz.* Various rivers.  
depressus. *Lam.* North Holland.

elongatus. *Pfeif.* Various rivers.  
litoralis. *Lam.* Various rivers.  
Petterianus? *Küst.* Montenegro, Greece.  
pictorum. *Lam.* Various rivers.  
platyrhynchus. *Rossm.* Carynthia.  
tumidus. *Retz.* Various rivers.  
Valentinus. *Rossm.* Lake Albufera, Spain.

##### ASIA.

abnormis. *More.* Bangkok.  
asperulus. *Lea.* Siam.  
Aucklandicus. *Gray.* New Zealand.  
Aveia. *Ben.* Pulo Penang.  
Bagdadensis. *Bourg.* Tigris.  
Bengalensis. *Lea.* Rivers of Bengal.  
Bensonii. *Lea.* East Indies?  
bilineatus. *Lea.* Rivers of Bengal.  
Bonneandii. *Eyd.*  
Bourguignatianus. *Lea.* River Tigris.  
Brownii. *Lea.* Mocha.  
Bruguierianus. *Bourg.* Smyrna.  
cæruleus. *Lea.* Rivers of Bengal.  
Cambodiensis. *Lea.* Takrong river, Siam.  
Chineusis. *Lea.* Hong Kong, China.  
complanatus. *Midd.* Kamtschatka.  
consobrinus. *Lea.* China.

- contradens. *Lea*. Java?  
 conus. *Speng*. Tranquebar.  
 corbis. *Bens*. Burhampooter river, Assam.  
 Corrianus. *Lea*. Rivers of India.  
 corrugatus. *Retz*. Rivers of Bengal.  
 crispatus. *Gould*. Savoy.  
 crispisulcatus. *Ben*. Bangong.  
 Cumingii. *Lea*. North of China.  
 Dahusicus. *Middl*. Schilka.  
 Damascensis. *Lea*. Syria.  
 Delesserti. *Bourg*. Jaffa.  
 delicatus. *Lea*. River Orontes, Syria.  
 delphinus. *Gruner*. Singapore.  
 dignatus. *Lea*. Tigris river. Bagdad.  
 Emeaensis. *Lea*. Orontes.  
 encirrus. *Bourg*. Near the Dardanelles.  
 episcopalis. *Trist*. River Orontes.  
 evanescens. *Mouss*. Java.  
 evitatus. *Lea*. Bengal.  
 eximius. *Lea*. Siam.  
 exolescens. *Gould*. Tavoy, Burmah.  
 favidens. *Ben*. Bengal.  
 Ferussacianus. *Lea*. Bagdad.  
 foliaceus. *Gould*. Tavoy, Burmah.  
 generosus. *Gould*. Tavoy, Burmah.  
 gibba. *Speng*. Tranquebar.  
 gibba. *Ben*. River Kiang, China.  
 Gontierii. *Bourg*. Crimea.  
 gravidus. *Lea*. Siam.  
 Grayanus. *Lea*. China.  
 Guadechaudii. *Eyd*. Bengal.  
 Hainesianus. *Lea*. Siam.  
 Housei. *Lea*. Siam.  
 Hueti. *Bourg*. Upper Euphrates.  
 humilis. *Lea*. Siam.  
 imperialis. *More*. River Meïnam, Siam.  
 Indicus. *Sow*. India.  
 Ingallsianus. *Lea*. Siam.  
 inornatus. *Lea*. Siam.  
 involutus. *Hanley*. Assam.  
 involutus. *Bens*. Burhampooter river.  
 Japanensis. *Lea*. Japan.  
 Jenkinsianus. *Ben*. Burhampooter river.  
 Jordanicus. *Bourg*. River Jordan.  
 Keraudreni. *Eyd*. Bengal.  
 Kullethensis. *Lea*. Mardin.  
 lævirostris. *Ben*. Chunar.  
 lamellatus. *Lea*. Bengal.  
 Lampreyanus. *B. & Ad*. Shanghai.  
 Laoensis. *Lea*. Siam.  
 Layardii. *Lea*. Ceylon.  
 Leaii. *Gray*. China.  
 Leioma. *Ben*. Near Bombay.  
 ligulus. *Mouss*. Java.  
 lunifer. *Bourg*. River Jordan.  
 luteus. *Lea*. Burmah.  
 lutulentus. *Gould*. New Zealand.  
 macilentus. *Ben*. Rohilkund.  
 Mardinensis. *Lea*. Tigris river.  
 marginalis. *Lam*. Bengal.  
 Mauritianus. *Lea*. Is. of Mauritius.  
 Menzieni. *Gray*. New Zealand.  
 micropterus. *More*. Cambodia.  
 Mongolicus. *Middl*. Gorbitza.  
 Mosulensis. *Lea*. Tigris river.  
 Murchisonianus. *Lea*. China.  
 mutabilis. *Lea*. Australia and New Zealand.  
 Myersianus. *Lea*. Siam.  
 Nagpoorensis. *Lea*. Ambajiri Tank, Bengal.  
 nucleus. *Lea*. Siam.  
 Nuttallianus. *Lea*. India.  
 nuxpersicæ. *Dunk. Benson*. Assam.  
 occatus. *Lea*. Bengal.  
 olivarius. *Lea*. Bengal.  
 orientalis. *Lea*. Java.  
 Orontesensis. *Lea*. Syria.  
 Orphaensis. *Lea*. River Tigris.  
 Osbeckii. *Phili*. River Yang-tse-Kiang,  
 China.  
 pachysoma. *Ben*. Burhampooter.  
 Paramattensis. *Lea*. N. S. Wales.  
 Pazii. *Lea*. China.  
 Peguensis. *Anth*. Pegu.  
 phasclus. *Lea*. Siam.  
 pilatus. *Lea*. Siam.  
 Pinax. *Ben*. Rohilkund.  
 plagiostoma. *Ben*. Bundelkhand.  
 plicatulus. *Lea*. Borneo.  
 ponderosus. *Lea*. China.  
 profugus. *Gould*. N. S. Wales.  
 Prusii. *Bourg*. Is. of Rhodes.  
 Pugio. *Ben*. Ava.  
 Rajahensis. *Lea*. Bengal.  
 rasmus. *Lea*. Assyria.

Rothi. *Bourg.* Lake Tiberias.  
 rusticus. *Lea.* Siam.  
 sagittarius. *Lea.* Siam.  
 scobinatus. *Lea.* Siam.  
 semiplicatus. *Trosc.* Ganges.  
 semiquadrata. *Sow.* Camboja.  
 semirugatus. *Lam.* Bagdad.  
 Shurtleffianus. *Lea.* Sena river, India.  
 Shuttleworthii. *Lea.* Australia.  
 Siamensis. *Lea.* Siam.  
 Sikkimensis. *Lea.* Sikkim, India.  
 simonis. *Trist.* River Jordan.  
 smaragdites. *Ben.* Burhampooter.  
 substriatus. *Lea.* Siam.  
 subtortus. *Baird & Adams.* Shanghai.  
 subtrigonus. *Sow.* Siam.  
 Sumatrensis. *Lea.* Sumatra.  
 superbus. *Lea.* Dana-Luar river, Sumatra.  
 Swinhoii. *H. Adams.* Formosa.  
 Syriacus. *Lea.* Orontes, Syria.  
 terminalis. *Bourg.* Lake Tiberias.  
 testudinarius. *Speng.* Tranquebar.  
 Theca. *Ben.* Bundelkhund.  
 Thwaitesii. *Lea.* Ceylon.  
 Tigris. *Fer.* River Tigris.  
 tortuosus. *Lea.* China.  
 triembolus. *Ben.* Ramgunga.  
 tripartitus. *Lea.* India.  
 truncatus. *Speng.* Tranquebar.  
 tumidulus. *Lea.* Siam.  
 Vescoi. *Bourg.* Anatolia.  
 vittatus. *Lea.* Australia.  
 Wrightii. *Lea.* China.  
 Wynegungaensis. *Lea.* Wynegunga river,  
 near Nagpoor, India.  
 Zelebori. *Fraun.* Neuseeland.

## AFRICA.

Abyssinicus. *Mart.* Abyssinia.  
 acuminatus. *H. Adams.* Lake Albert Nyanza.  
 Aferulus. *Lea.* Lake Nyassa.  
 Africanus. *Lea.* Cape of Good Hope.  
 Bakeri. *H. Adams.* Lake Albert Nyanza.  
 Burtoni. *Woodward.* Lake Tanganyika.  
 Caffer. *Krauss.* Cape of Good Hope.  
 Cailliaudii. *Fer.* Nile.

Cyamus. *Phil.* E. Africa.  
 Dembeæ. *Reeve.* Abyssinia.  
 diminutus. *Lea.* E. Africa.  
 divaricatus. *Lea.* Egypt.  
 Durieni. *Desh.* Algeria.  
 Egyptiacus. *Cuilliaud.* Nile.  
 Fellmani. *Desh.* Algeria.  
 Gabonensis. *Küst.* Gabon river.  
 Kirkii. *Lea.* Lake Nyassa.  
 Moreleti. *Desh.* Algeria.  
 Natalensis. *Lea.* Umpingave river.  
 Niloticus. *Fer.* Nile.  
 Nyassaensis. *Lea.* Lake Nyassa.  
 Ravoisieri. *Desh.* Algeria.  
 Sitifensis. *More.* Algiers.  
 Verreauxianus. *Lea.* Cape of Good Hope.

## NORTH AMERICA.

abacus. *Hald.* Tennessee.  
 Abbevillensis. *Lea.* South Carolina.  
 aberrans. *Lea.* Neuse river, N. C.  
 Aberti. *Con.* Verdigris river, Ark.  
 acutissimus. *Lea.* Alabama river.  
 æquatus. *Lea.* Buckhead creek, Ga.  
 æruginosus. *More.* Central America.  
 Æsopus. *Green.* Ohio river.  
 aheneus. *Lea.* Black creek, Florida.  
 affinis. *Lea.* Alexandria, Louisiana.  
 alatus. *Say.* Ohio river.  
 altilis. *Con.* Alabama river.  
 amabilis. *Lea.* Georgia.  
 amœnus. *Lea.* Holston river, Tenn.  
 amygdalum. *Lea.* Lake George, Florida.  
 anaticulus. *Lea.* Columbus, Missi.  
 angustatus. *Lea.* Cooper river, S. C.  
 Anodontoides. *Lea.* Mississippi, Ohio, &c.  
 Anthonyi. *Lea.* Florida.  
 apicinus. *Lea.* Othealooga creek, Ga.  
 apiculatus. *Say.* Bayou Teche, La.  
 approximatus. *Lea.* Red river, La.  
 aquilus. *Lea.* Macon, Ga.  
 aratus. *Lea.* Lake Nicaragua.  
 arcæformis. *Lea.* Cumberland river, Tenn.  
 aretatus. *Con.* Black Warrior river, Ala.  
 arctior. *Lea.* Ohio river.  
 areus. *Con.* Alabama river.

- argenteus. *Lea.* Holston river, Tenn.  
 Arkansasensis. *Lea.* Hot Springs, Ark.  
 arquatus. *Con.* Wabash river, Indiana.  
 asper. *Lea.* Alabama river.  
 asperatus. *Lea.* Alabama river.  
 asperrimus. *Lea.* Ohio river.  
 atrocostatus. *Lea.* Alexandria, La.  
 atromarginatus. *Lea.* Chattahoochee river, Ga.  
 aureus. *Lea.* Texas.  
 Averyi. *Lea.* Chumnagua river, Isthmus of Darien.  
 Aztecorum. *Phili.* Mexico.  
 Bairdianus. *Lea.* Devil's river, Texas.  
 Baldwinensis. *Lea.* Baldwin county, Ga.  
 Barnesianus. *Lea.* Cumberland river, Tenn.  
 Barrattii. *Lea.* Abbeville, S. C.  
 Beadleianus. *Lea.* Pearl river, Missi.  
 Bealei. *Lea.* Leon county, Texas.  
 Beaverensis. *Lea.* Beaver creek, N. C.  
 Berlandierii. *Lea.* Mexico and Texas.  
 biangulatus. *Lea.* Caney Fork, Tenn.  
 bicmarginatus. *Lea.* Florence, Ala.  
 Bigbyensis. *Lea.* Maury county, Tenn.  
 Binneyi. *Lea.* Alabama.  
 Bisselianus. *Lea.* Charlotte, N. C.  
 Blandianus. *Lea.* Othcalooga creek, Ga.  
 Blandingianus. *Lea.* St. John's river, Fla.  
 Bournianus. *Lea.* Scioto, Ohio.  
 Boydianus. *Lea.* Oak Orchard creek, N. Y.  
 Boykinianus. *Lea.* Chattahoochee, Ga.  
 bracteatus. *Gould.* Llanos river, Texas.  
 brevidens. *Lea.* Cumberland, Tenn.  
 Brumbyanus. *Lea.* Warrior river, Ala.  
 Buckleyi. *Lea.* Lake George, Fla.  
 Buddianus. *Lea.* Lake George, Fla.  
 bulbosus. *Lea.* Flint river, Ga.  
 Brazosensis. *Lea.* Brazos river, Texas.  
 Burkensis. *Lea.* Burke county, Ga.  
 buxeus. *Lea.* Abbeville, S. C.  
 cacao. *Lea.* West Florida.  
 cælatus. *Con.* Elk river, Tenn.  
 Caldwellii. *Lea.* Isthmus of Darien.  
 caliginosus. *Lea.* Red river, La.  
 calimatarum. *More.* Central America.  
 callosus. *Lea.* Ohio canal, near Columbus.  
 camelopardilis. *Lea.* N. Alabama.  
 camelus. *Lea.* Ohio river.  
 camptodon. *Say.* New Orleans, La.  
 Canadensis. *Lea.* St. Lawrence at Montreal.  
 capax. *Green.* Ohio and Mississippi rivers.  
 caperatus. *Lea.* Clinch river, Tenn.  
 capsæformis. *Lea.* Cumberland, Tenn.  
 carbonarius. *Lea.* Medellin river, Mexico.  
 cariosus. *Say.* Schuylkill river, Pa.  
 castaneus. *Lea.* Alabama river.  
 castus. *Lea.* So. Carolina.  
 Catawbensis. *Lea.* Gaston county, N. C.  
 Charlottensis. *Lea.* Mecklenburg, N. C.  
 Chathamensis. *Lea.* Chatham county, N. C.  
 Chattanoogaensis. *Lea.* Etowah, &c., Ga.  
 Chickasawhensis. *Lea.* Chickasawha river, Missi.  
 Chunii. *Lea.* Dallas, Texas.  
 dicur. *Lea.* Little Oemulgee, Ga.  
 Cincinnatiensis. *Lea.* Ohio river.  
 cinnamomicus. *Lea.* Tombigbee river, Missi.  
 circulus. *Lea.* Ohio river.  
 cistellæformis. *Lea.* Neuse river, N. C.  
 Claibornensis. *Lea.* Alabama river.  
 Clarkianus. *Lea.* Williamsport, Tenn.  
 clavus. *Lam.* Ohio river.  
 Clinchensis. *Lea.* E. Tennessee.  
 coccineus. *Lea.* Ohio river.  
 cognatus. *Lea.* Mexico.  
 collinus. *Con.* North river, Va.  
 Coloradoensis. *Lea.* Rio Colorado, Texas.  
 compactus. *Lea.* Etowah river, Ga.  
 complanatus. *Soland.* Schuylkill river, Pa.  
 compressissimus. *Lea.* Holston river, Tenn.  
 concavus. *Lea.* Abbeville, S. C.  
 concestator. *Lea.* Columbus, Ga.  
 concolor. *Lea.* Big Prairie creek, Ala.  
 confertus. *Lea.* Santee canal, S. C.  
 Congaræus. *Lea.* Congaree river, S. C.  
 Conradianus. *Lea.* Tennessee and Alabama.  
 consanguineus. *Lea.* Etowah river, Ga.  
 constrictus. *Con.* North river, Va.  
 contiguus. *Lea.* Union county, N. C.  
 contractus. *Lea.* Roanoke river, N. C.  
 Cooperianus. *Lea.* Ohio river.  
 Copei. *Lea.* Holston river, Va.  
 cor. *Con.* Elk and Flint rivers, Tenn.  
 cornutus. *Bar.* Ohio river.  
 corvinus. *Lea.* Flint river, Ga.

- coruscus. *Gould*. Florida.  
 corvunculus. *Lea*. Whitfield county, Ga.  
 corvus. *Lea*. Burke county, Ga.  
 Couchianus. *Lea*. Mexico.  
 crapulus. *Lea*. Etowah river, Ga.  
 crassidens. *Lam*. Ohio river.  
 crebrivittatus. *Lea*. Coosawattee creek, Ga.  
 creperus. *Lea*. Tennessee.  
 crocatus. *Lea*. Savannah river, Ga.  
 crocodilorum. *More*. Central America.  
 Cromwellii. *Lea*. Georgia.  
 Cumberlandicus. *Lea*. Cumberland river,  
 Tenn.  
 cunecolus. *Lea*. Holston river, Tenn.  
 cuprinus. *Lea*. Mexico.  
 curatus. *Lea*. Sugar creek, N. C.  
 curtus. *Lea*. Tombigbee river, Missi.  
 Cuvierianus. *Lea*. Washington county, Ga.  
 cylindrellus. *Lea*. Whitfield county, Ga.,  
 and North Alabama.  
 cylindricus. *Say*. Ohio river.  
 eyrenoides. *Phili*. Lake Nicaragua.  
 dactylus. *Lea*. Caney Fork, Tenn.  
 Dariensis. *Lea*. Darien, Ga.  
 datus. *Lea*. Beaver creek, N. C.  
 decisus. *Lea*. Alabama river.  
 declivis. *Say*. Bayou Teche, La.  
 decoratus. *Lea*. Abbeville Dist., S. C.  
 decumbens. *Lea*. Alabama.  
 delphinulus. *More*. Central America.  
 denigratus. *Lea*. Columbus, Ga.  
 depygis. *Con*. Harpeth river, Tenn.  
 difficilis. *Lea*. Whitfield county, Ga.  
 digitatus. *More*. Central America.  
 discus. *Lea*. Tampico, Mexico.  
 discrepans. *Lea*. North Alabama.  
 dispar. *Lea*. Columbus, Ga.  
 dolabræformis. *Lea*. Altamaha, Ga.  
 dollabelloides. *Lea*. Holston river, Tenn.  
 dolosus. *Lea*. Alabama river.  
 donaciformis. *Lea*. Tennessee.  
 Dorfeuillianus. *Lea*. Ohio river.  
 dorsatus. *Lea*. Catawba river, N. C.  
 Downiei. *Lea*. Satilla run, Ga.  
 dromas. *Lea*. Tennessee.  
 Duttonianus. *Lea*. Ogechee canal, Ga.  
 Dysonii. *Lea*. Honduras.  
 ebenus. *Lea*. Ohio river, Cincinnati.  
 Edgarianus. *Lea*. Holston river, Tenn.  
 Eightsii. *Lea*. Mexico.  
 elegans. *Lea*. Ohio river.  
 Elliottii. *Lea*. Othealooga creek, Ga.  
 ellipsis. *Lea*. Ohio river.  
 Emmonsii. *Lea*. Roanoke, N. C.  
 errans. *Lea*. Macon, Ga.  
 Estabrookianus. *Lea*. Clinch river, Tenn.  
 exactus. *Lea*. Neuse river, N. C.  
 excavatus. *Lea*. Othealooga creek, Ga.  
 exiguus. *Lea*. Chattahoochee river, Ga.  
 extensus. *Lea*. Columbus, Ga.  
 fabaceus. *Lea*. Oostenaula river, Ga.  
 fabalis. *Lea*. Ohio river, Cincinnati.  
 fallax. *Lea*. Columbus, Ga.  
 famelicus. *Gould*. Wallawalla river, Oregon.  
 fassinans. *Lea*. Holston river, E. Tenn.  
 fatuus. *Lea*. Holston river, E. Tenn.  
 favosus. *Lea*. Othealooga creek, Ga.  
 fibuloides. *Lea*. Connasauga river, Ga.  
 Fisherianus. *Lea*. Chester river, Md.  
 flavescens. *Lea*. Black Warrior, Ala.  
 flavidulus. *Lea*. Columbus, Missi.  
 Florentinus. *Lea*. Tennessee river, Ala.  
 Floridensis. *Lea*. Chácktáhachie river, W. Fla.  
 foliatus. *Hild*. Ohio river.  
 folliculatus. *Lea*. Savannah river, Ga.  
 Forbeseanus. *Lea*. Savannah river, Ga.  
 Formanianus. *Lea*. Coosa river, Ala.  
 Forsheyi. *Lea*. Fayette county, Texas.  
 fragosus. *Con*. Ohio river.  
 fraternus. *Lea*. Columbus, Ga.  
 fucatus. *Lea*. North Alabama.  
 fulgidus. *Lea*. Alexandria, La.  
 fuliginosus. *Lea*. Cobb's creek, near Phila.  
 fulvus. *Lea*. South Carolina.  
 fumatus. *Lea*. Columbus, Ga.  
 fuscatus. *Lea*. Black creek, Fla.  
 Gastonensis. *Lea*. Gaston county, N. C.  
 Geddingsianus. *Lea*. Congaree river, S. C.  
 geminus. *Lea*. Buckhead creek, Ga.  
 Georgianus. *Lea*. Stump creek, Ga.  
 Gerhardtii. *Lea*. Chattanooga, Ga.  
 germanus. *Lea*. Coosa river, Ala.  
 genuinus. *Lea*. Bissel's pond, N. C.  
 gibber. *Lea*. Carryfork river, Tenn.

- Gibbesianus. *Lea.* Abbeville Dist., S. C.  
 gibbosus. *Bar.* Ohio river.  
 glaber. *Lea.* Holston river, Tenn.  
 glandaceus. *Lea.* Cahawba river, Ala.  
 glans. *Lea.* Ohio river, Cincinnati.  
 Gouldii. *Lea.* Tuscaloosa, Ala.  
 gracilentus. *Lea.* Catawba, N. C.  
 gracilior. *Lea.* Buckhead creek, Ga.  
 gracilis. *Bar.* Ohio river.  
 Granadensis. *Lea.* Lake Nicaragua.  
 grandidens. *Lea.* Hot Springs, Ark.  
 graniferus. *Lea.* Ohio river, Cincinnati.  
 granulatus. *Lea.* Big Prairie creek, Ala.  
 Greenii. *Con.* Black Warrior river, Ala.  
 Griffithianus. *Lea.* South Carolina.  
 gubernaculum. *Reeve.* N. America.  
 Haleianus. *Lea.* Missi. river, N. Orleans.  
 Hallenbeckii. *Lea.* Columbus, Ga.  
 Hanleyanus. *Lea.* Coosawattee river, Ga.  
 Hartmanii. *Lea.* Coosa river, Ala.  
 Haysianus. *Lea.* Cumberland river, Tenn.  
 Hazlehurstianus. *Lea.* Satilla river, Ga.  
 hebes. *Lea.* Oconee river, Ga.  
 hebetatus. *Con.* Missouri.  
 Heermanii. *Lea.* Medina river, Texas.  
 hepaticus. *Lea.* Salkahatchee river, S. C.  
 heterodon. *Lea.* Schuylkill river, Pa.  
 Higginsii. *Lea.* Muscatine, Iowa.  
 hippopæus. *Lea.* Lake Erie.  
 Holstonensis. *Lea.* Holston river, Tenn.  
 Hopetonensis. *Lea.* Darien, Ga.  
 Houstonensis. *Lea.* Houston, Texas.  
 humerosus. *Lea.* Catawba, N. C.  
 hyalinus. *Lea.* Richmond, Va.  
 Hydianus. *Lea.* Teche river, La.  
 incrassatus. *Lea.* Chattahoochee river, Ga.  
 indefinitus. *Lea.* Mecklenburg co., N. C.  
 ineptus. *Lea.* Abbeville Dist., S. C.  
 inflatus. *Lea.* Alabama river, Claiborne.  
 infucatus. *Con.* Flint river, Ga.  
 instructus. *Lea.* Cahawba river, Ala.  
 insulsus. *Lea.* Roanoke river, N. C.  
 intercedens. *Lea.* Columbus, Ga.  
 intermedius. *Con.* Nolachucky river, Tenn.  
 interruptus. *Lea.* Harpeth river, Tenn.  
 interventus. *Lea.* Cahawba river, Ala.  
 inusitatus. *Lea.* Macon, Ga.  
 iris. *Lea.* Ohio river, Cincinnati.  
 irrasus. *Lea.* Etowah river, Ga.  
 irroratus. *Lea.* Ohio river, Cincinnati.  
 Jamesianus. *Lea.* Jackson, Miss.  
 Jayensis. *Lea.* Florida.  
 jejunus. *Lea.* Roanoke, N. C.  
 Jewettii. *Lea.* Florida.  
 Johannis. *Lea.* Etowah, Ga.  
 Jonesii. *Lea.* Georgia.  
 Keinerianus. *Lea.* Coosawattee river, Ga.  
 Kirtlandianus. *Lea.* Mahoning river, O.  
 Kleinianus. *Lea.* Suwanee river, Fla.  
 lacrymosus. *Lea.* Ohio river, Cincinnati.  
 lævissimus. *Lea.* Ohio river, Cincinnati.  
 lanceolatus. *Lea.* Tar river, N. C.  
 latecostatus. *Lea.* Tuscaloosa river, Ala.  
 latus. *Lea.* Savannah, Ga.  
 Lazarus. *Lea.* Abbeville Dist., S. C.  
 Lecontianus. *Lea.* Cannouchee river, Ga.  
 Leibii. *Lea.* Michigan.  
 lenior. *Lea.* Stone's river, Tenn.  
 lens. *Lea.* Ohio river, Cincinnati.  
 lepidus. *Gould.* Florida.  
 Lesleyi. *Lea.* Kentucky.  
 Lesueurianus. *Lea.* Caney Fork and Holston  
 rivers, Tenn.  
 Lewisii. *Lea.* Coosa river, Ala.  
 Liebmanni. *Phili.* Mexico.  
 lienosus. *Con.* North Alabama.  
 ligamentinus. *Lam.* Ohio river.  
 limatulus. *Con.* Savannah river, Ga.  
 Lincecumii. *Lea.* Dallas county, Texas.  
 Lindsleyi. *Lea.* Tennessee.  
 lineatus. *Lea.* Chattahoochee river, Ga.  
 linguæformis. *Lea.* Columbus, Ga.  
 Livingstonensis. *Lea.* Brunswick co., N. C.  
 lucidus. *Lea.* Brunswick county, N. C.  
 lugubris. *Lea.* Darien, Ga.  
 luridus. *Lea.* Coosawattee river, Ga.  
 luteolus. *Lam.* Ohio river.  
 Lyonii. *Lea.* East Tenn.  
 Maconensis. *Lea.* Flint river, Ga.  
 macrodon. *Lea.* Rutersville, Texas.  
 maculatus. *Con.* Elk and Flint rivers, Ga.  
 mæstus. *Lea.* French Broad, E. Tenn.  
 manubius. *Gould.* Chihuahua, Mex.  
 marginis. *Lea.* Georgia.



- Masoni. *Con.* Augusta, Ga.  
 Mecklenbergensis. *Lea.* Charlotte, N. C.  
 Medellinus. *Lea.* Medellin river, Vera Cruz.  
 mediocris. *Lea.* Neuse river, N. C.  
 medius. *Lea.* Coosa river, Ala.  
 Menkianus. *Lea.* Harpeth river.  
 Mercerii. *Lea.* Lee county, Ga.  
 Meridithii. *Lea.* Tennessee river, Tuscumbia, Ala.  
 merus. *Lea.* Abbeville Dist., S. C.  
 metanever. *Raf.* Ohio river.  
 Mexicanus. *Phili.* Mexico.  
 micans. *Lea.* Catawba river, N. C.  
 minor. *Lea.* Lakes George and Monroe, Fla.  
 Mississippiensis. *Con.* Lower Missi. river.  
 modicellus. *Lea.* Connasauga river, Ga.  
 modicus. *Lea.* Columbus, Ga.  
 modioliformis. *Lea.* Santee canal, S. C.  
 monodontus. *Say.* Ohio river.  
 Monroensis. *Lea.* Lake Monroe, Fla.  
 Mooresianus. *Lea.* Tuscumbia, Ala.  
 Moussonianus. *Lea.* Georgia.  
 Mühlfeldianus. *Lea.* Cumberland river, Tenn.  
 multiplicatus. *Lea.* Ohio river, Cincinnati.  
 multiradiatus. *Lea.* Cumberland river, Tenn.  
 mundus. *Lea.* Tuscumbia, Ala.  
 Murrayensis. *Lea.* Murray county, Ga.  
 mytiloides. *Raf.* Ohio river.  
 Nashvillensis. *Lea.* Tennessee.  
 nasutulus. *Lea.* Brunswick county, N. C.  
 nasutus. *Say.* Schuylkill river, Pa.  
 naviculoides. *Lea.* Buckhead creek, Ga.  
 negatus. *Lea.* Big Prairie creek, Ala.  
 neglectus. *Lea.* North Alabama.  
 Neislerii. *Lea.* Flint river, Ga.  
 Neusensis. *Lea.* Neuse river, N. C.  
 Newcombianus. *Lea.* Lake Nicaragua.  
 Nicklinianus. *Lea.* Tampico, Mex.  
 nigellus. *Lea.* Chattahoochee river, Ga.  
 nigerrimus. *Lea.* Alexandria, La.  
 nigrinus. *Lea.* West Florida.  
 nitens. *Lea.* Long creek, Cocke co., Tenn.  
 Northamptonensis. *Lea.* Connecticut river.  
 notatus. *Lea.* Cumberland river.  
 Novi-Eboraci. *Lea.* Oak Orchard creek, N. Y.  
 nubilus. *Lea.* Paw creek, N. C.  
 nucleopsis. *Con.* Etowah river, Ga.  
 nux. *Lea.* Alabama river.  
 obesus. *Lea.* York river, Va., and S. C.  
 obfuscus. *Lea.* Flint river, Ga.  
 oblatus. *Lea.* Gaston county, N. C.  
 obliquus. *Lam.* Ohio river.  
 obnubilus. *Lea.* Buckhead creek, Ga.  
 obscurus. *Lea.* Nashville, Tenn.  
 obtusus. *Lea.* Chattahoochee river, Ga.  
 occidentens. *Lea.* Ohio river, Cincinnati.  
 occidentalis. *Con.* Currant river, Ark.  
 occultus. *Lea.* Lake Monroe, Fla.  
 ochraceus. *Say.* Schuylkill river, Pa.  
 Ocmulgéensis. *Lea.* Little Ocmulgee river, Ga.  
 opacus. *Lea.* Buckhead creek, Ga.  
 orbiculatus. *Hill.* Ohio river.  
 Oregonensis. *Lea.* Oregon.  
 ornatus. *Lea.* Alabama?  
 Othcaloogensis. *Lea.* Othcalooga creek, Ga.  
 ovatus. *Say.* Ohio river.  
 oviformis. *Con.* Tennessee.  
 pallescens. *Lea.* Tuscaloosa, Ala.  
 palliatus. *Lea.* South Carolina.  
 pallidofulvus. *Lea.* Cahawba river, Ala.  
 paludicolus. *Gould.* Florida.  
 papyraceus. *Gould.* Florida.  
 parvulus. *Lea.* Coosa river, Ala.  
 parvus. *Bar.* Ohio river.  
 patulus. *Lea.* Western Ohio.  
 paulus. *Lea.* Chattahoochee river, Ga.  
 pauperculus. *Lea.* Columbus, Missi.  
 Pawensis. *Lea.* Paw creek, N. C.  
 pectorosus. *Con.* Elk river, Tenn.  
 pellucidus. *Lea.* Chattahoochee river, Ga.  
 penicillatus. *Lea.* Chattahoochee, Ga.  
 penitus. *Con.* Alabama river.  
 perdix. *Lea.* Harpeth river, Tenn.  
 perovatus. *Con.* Greene county, Ala.  
 perovalis. *Con.* Alabama river.  
 perplexus. *Lea.* Ohio river.  
 percoarctatus. *Lea.* Catawba river, N. C.  
 perlatus. *Lea.* Cape Fear river, N. C.  
 perlucens. *Lea.* Sampson county, N. C.  
 permiscens. *Lea.* Tombigbee river, Miss.  
 pernodosus. *Lea.* North Carolina.  
 perpastus. *Lea.* Coosa river, Ala.  
 perpictus. *Lea.* Bull river, Tenn.  
 perplicatus. *Con.* Jackson, La.

- perpurpureus. *Lea.* Tennessee.  
 perradiatus. *Lea.* Tennessee river, Florence, Ala.  
 personatus. *Say.* Wabash river, Ind.  
 perstriatus. *Lea.* Abbeville Dist., S. C.  
 pertenuis. *Lea.* Neuse river, N. C.  
 petrinus. *Goull.* Llanos river, Mex.  
 phaseolus. *Hill.* Ohio river.  
 Phillipsii. *Con.* Ohio river.  
 pictus. *Lea.* Harpeth river, Tenn.  
 pilaris. *Lea.* French Broad, and Holston rivers, Tenn.  
 pileus. *Lea.* Ohio river, Cincinnati.  
 pinguis. *Lea.* St. Peter's river, Upper Mississippi.  
 placitus. *Lea.* Alabama.  
 plancus. *Lea.* Coosa river, Ala.  
 planicostatus. *Lea.* Tusculmbia, Ala.  
 planilaterus. *Con.* Yadkin river, N. C.  
 Plantii. *Lea.* Flint river, Ga.  
 plenus. *Lea.* Ohio river, Cincinnati.  
 pliciferus. *Lea.* Mexico.  
 plicatus. *Lesueur.* Ohio river.  
 Poeyanus. *Lea.* Rio de las Balsas, Mexico.  
 Popeii. *Lea.* Devil's river, Texas.  
 porphyreus. *Lea.* Coosa river, Ala.  
 Postellii. *Lea.* Columbus, Ga.  
 Powellii. *Lea.* Sabine river, Ark.  
 Prattii. *Lea.* Cobb county, Ga.  
 pressus. *Lea.* Ohio river, Cincinnati.  
 Prevostianns. *Lea.* Etowah river, Ga.  
 productus. *Con.* Savannah river, Augusta, Ga.  
 propinquus. *Lea.* Tennessee river, Florence, Ala.  
 proprius. *Lea.* Georgia.  
 protensus. *Lea.* North Carolina.  
 proximus. *Lea.* Georgia.  
 pudicus. *Lea.* North Alabama.  
 puleher. *Lea.* Nashville, Tenn.  
 pullatus. *Lea.* Columbus, Ga.  
 pullus. *Con.* Wateree river, S. C.  
 pulvinulus. *Lea.* Murray county, Tenn.  
 pumilus. *Lea.* Black river, N. C.  
 punctatus. *Lea.* Tennessee.  
 puniceus. *Hald.* Holston river, Tenn.  
 purpuratus. *Lam.* Lower Mississippi.  
 purpurellus. *Lea.* Flint river, Ga.  
 purus. *Lea.* Neuse river, N. C.  
 pusillus. *Lea.* Ogeechee river, Ga.  
 pustulatus. *Lea.* Ohio river, Cincinnati.  
 pustulosus. *Lea.* Ohio river, Cincinnati.  
 Pybasii. *Lea.* Tennessee river, Tusculmbia Ala.  
 pygmæus. *Lea.* Abbeville, S. C.  
 pyramidatus. *Lea.* Ohio river, Cincinnati.  
 pyriformis. *Lea.* Columbus, Ga.  
 quadrans. *Lea.* Texas.  
 quadratus. *Lea.* Columbus, Ga.  
 quadrilaterus. *Lea.* S. and N. Carolina.  
 radians. *Lea.* Othcalooga river, Ga.  
 radiatus. *Lam.* Lake Saratoga, Hudson river, Delaware river.  
 Raeénsis. *Lea.* Columbus, Ga.  
 Raleighensis. *Lea.* Neuse river, N. C.  
 Rangianus. *Lea.* Ohio river, Cincinnati.  
 Ravenelianus. *Lea.* North Carolina.  
 rectus. *Lam.* Ohio river.  
 Reeveianus. *Lea.* Alexandria, La.  
 refulgens. *Lea.* Lauderdale county, Missi.  
 regularis. *Lea.* French Broad river, E. Tenn.  
 retusus. *Lam.* Ohio river.  
 Rhumphianus. *Lea.* West Georgia.  
 Riddellii. *Lea.* Dallas, Texas.  
 Roanokensis. *Lea.* Tar river, N. C.  
 rostriformis. *Lea.* Macon county, Ga.  
 rostrum. *Lea.* Davidson county, N. C.  
 Roswellensis. *Lea.* Cobb county, Ga.  
 rotundatus. *Lam.* Ohio river.  
 Rowellii. *Lea.* Chagres river, Cent. Am.  
 rubellinus. *Lea.* Othcalooga creek, Ga.  
 rubellus. *Con.* Black Warrior, Ala.  
 rubidus. *Lea.* Tombigbee river, Missi.  
 rubiginosus. *Lea.* Ohio river, Cincinnati.  
 rufus. *Lea.* Etowah river, Ga.  
 rufusculus. *Lea.* Abbeville Dist., S. C.  
 rugososulcatus. *Lea.* Central America.  
 Rutersvillensis. *Lea.* Fayette co., Texas.  
 rutilans. *Lea.* Othcalooga creek, Ga.  
 sagittæformis. *Lea.* Oconee river, Ga.  
 Saladoensis. *Lea.* Mexico.  
 salebrosus. *Lea.* Columbus, Ga.  
 Sapotalensis. *Lea.* Sapotal river, Mex.

- Satillaensis.* *Lea.* Camden county, Ga.  
*satur.* *Lea.* Alexandria, La.  
*Savannahensis.* *Lea.* Savannah river, Ga.  
*saxeus.* *Con.* Alabama river, Claiborne, Ala.  
*Scamnatus.* *Morelet.* Cuba and Honduras.  
*Schoolcraftii.* *Lea.* Fox river of Green Bay,  
 Wisconsin.  
*scitulus.* *Lea.* Tuscumbia, Ala.  
*securis.* *Lea.* Ohio river, Cincinnati.  
*semigranosus.* *V. d. Busch.* Tampico, Mex.  
*Shepardianus.* *Lea.* Savannah river, Ga.  
*Showalterii.* *Lea.* Coosa river, Ala.  
*similis.* *Lea.* Buckhead creek, Ga.  
*simplex.* *Lea.* Black Warrior, Ala.  
*Simpsonii.* *Lea.* Wabash river, Ind.  
*simus.* *Lea.* Cumberland river, Tenn.  
*Sloatianus.* *Lea.* Chattahoochee river, Ga.  
*solidus.* *Lea.* Ohio river, Cincinnati.  
*sordidus.* *Lea.* Abbeville District, S. C.  
*Sowerbianus.* *Lea.* Tennessee.  
*spadiceus.* *Lea.* Deep river, N. C.  
*sparsus.* *Lea.* Holston river, Tenn.  
*sparus.* *Lea.* Whitfield county, Ga.  
*spatulatus.* *Lea.* Rock river, Wisconsin.  
*speciosus.* *Lea.* Colorado river, Texas.  
*sphaericus.* *Lea.* Pearl river, Missi.  
*Spillmanii.* *Lea.* Luxpallila creek, Missi.  
*spinosus.* *Lea.* Altamaha river, Wis.  
*spissus.* *Lea.* Satilla river, Ga.  
*splendidus.* *Lea.* Altamaha river, Ga.  
*squalidus.* *Lea.* Neuse river, N. C.  
*squameus.* *Lea.* North Carolina.  
*stabilis.* *Lea.* Coosa river, Ala.  
*stagnalis.* *Con.* Ogechee river, Ga.  
*stapes.* *Lea.* Alabama river, Ala.  
*Stewardsonii.* *Lea.* Chattanooga river, Tenn.  
*Stonensis.* *Lea.* Stone's river, Tenn.  
*stramineus.* *Con.* Greene county, Ala.  
*Strebelii.* *Lea.* Vera Cruz, Mexico.  
*striatulus.* *Lea.* Roanoke river, N. C.  
*striatus.* *Lea.* Chattahoochee river, Ga.  
*strigosus.* *Lea.* Chattahoochee river, Ga.  
*subangulatus.* *Lea.* Chattahoochee river, Ga.  
*suberocceus.* *Con.* Canadian river, Ark.  
*subellipsis.* *Lea.* Columbus, Ga.  
*subflavus.* *Lea.* Macon county, Ga.  
*subgibbosus.* *Lea.* Etowah river, Ga.  
*subinflatus.* *Con.* Savannah river.  
*sublatus.* *Lea.* Columbus, Ga.  
*subniger.* *Lea.* Flint river, Ga.  
*subovatus.* *Lea.* Ohio river, Cincinnati.  
*subplanus.* *Con.* North river, Va.  
*subrotundus.* *Lea.* Ohio river, Cincinnati.  
*subtentus.* *Say.* Holston river, Tenn.  
*succissus.* *Lea.* West Florida.  
*sudus.* *Lea.* Columbus, Ga.  
*sulcatus.* *Lea.* Ohio river, Cincinnati.  
*symmetricus.* *Lea.* Red river, La.  
*Tabascoensis.* *Phili.* Mexico.  
*tæniatus.* *Con.* Flint river, Ga.  
*Taitianus.* *Lea.* Alabama river, Claiborne.  
*Tampicoensis.* *Lea.* Medellin river, Mex.  
*Tappanianus.* *Lea.* Juniata river, Pa.  
*Tecomatensis.* *Lea.* Tecomata river, Mex.  
*tener.* *Lea.* Pigeon river, Tenn.  
*tenerus.* *Rav.* South Carolina.  
*Tennesseensis.* *Lea.* Stone's river, Tenn.  
*tenuissimus.* *Lea.* Ohio river, Cincinnati.  
*tesserula.* *Lea.* Nolachucky river, Tenn.  
*tetralasmus.* *Say.* Bayou St. John, La.  
*tetricus.* *Lea.* Flint river, Ga.  
*Texasensis.* *Lea.* Dewitt county, Texas.  
*Thorntonii.* *Lea.* Tuscumbia, Ala.  
*Topekaensis.* *Lea.* Kansas.  
*tortivus.* *Lea.* Chattahoochee river, Ga.  
*trapezoides.* *Lea.* Lake St. Josephs, La.  
*triangularis.* *Bar.* Ohio river.  
*trigonus.* *Lea.* Ohio river, Cincinnati.  
*trinacrus.* *Lea.* Coosa river, Ala.  
*Troostensis.* *Lea.* Tennessee.  
*Troschelianus.* *Lea.* Coosawattee river, Ga.  
*trossulus.* *Lea.* Lake Monroe, Fla.  
*tuberculatus.* *Bar.* Ohio river.  
*tuberosus.* *Lea.* Caney Fork river, Tenn.  
*tumescens.* *Lea.* Alexandria, La.  
*Tuomeyi.* *Lea.* Abbeville Dist., S. C.  
*turgidulus.* *Lea.* Cumberland river, Tenn.  
*turgidus.* *Lea.* New Orleans, La.  
*Uharëensis.* *Lea.* Georgia and Arkansas.  
*umbrans.* *Lea.* Othealooga creek, Ga.  
*umbrosus.* *Lea.* Medellin river, Mex.  
*undulatus.* *Bar.* Ohio river.  
*unicolor.* *Lea.* Tuscaloosa, Ala.  
*utriculus.* *Lea.* North Carolina.

vallatus. *Lea.* Alabama.  
 Vanuxemii. *Lea.* Cumberland river, Tenn.  
 varicosus. *Lea.* Ohio river, Cincinnati.  
 Vaughanianus. *Lea.* Camden, S. C.  
 velatus. *Con.* St. Fois river.  
 vellicatus. *Reeve.* Guatemala.  
 ventricosus. *Bar.* Ohio river.  
 venustus. *Lea.* Potosi, Misso.  
 Veraacruzensis. *Lea.* Mexico.  
 verrucosus. *Bar.* Ohio river.  
 verus. *Lea.* Cahawba river, Ala.  
 verutus. *Lea.* Columbus, Ga.  
 vestitus. *Lea.* Ogeechee river, Ga.  
 vibex. *Con.* Black Warrior river, Ala.  
 vicinus. *Lea.* Macon, Ga.  
 virens. *Lea.* Georgia.  
 virescens. *Lea.* Tusculumbia, Ala.  
 viridans. *Lea.* Columbus, Ga.  
 viridicatus. *Lea.* Buckhead creek, Ga.  
 viridiradiatus. *Lea.* Big Uchee river, Ala.  
 viridulus. *Lea.* Neuse river, N. C.  
 Wardii. *Lea.* Wallhonding river, Ohio.  
 Waterënsis. *Lea.* Wateree canal, S. C.  
 Waccamawensis. *Lea.* Waccamaw lake, N. C.  
 Weldonensis. *Lea.* Roanoke river, N. C.  
 Whiteianus. *Lea.* Savannah, Ga.  
 Woodwardianus. *Lea.* Etowah river, Ga.  
 Zeiglerianus. *Lea.* Cumberland river, Tenn.  
 zigzag. *Lea.* Ohio river.

## SOUTH AND CENTRAL AMERICA.

acutirostris. *Lea.* —?   
 Æthiops. *Lea.* Uruguay river.  
 ampullaceus. *Lea.* —?   
 apprimus. *Lea.* —?   
 atratus. *Sow.* Chili.  
 auratus. *Swain.* Chili.  
 Besckianus. *Phili.* Brazil.  
 bulloides. *Lea.* Rio la Plata.  
 Burroughianus. *Lea.* Rio Parana.  
 Casablancæ. *Phili.* Valparaiso.  
 charruanus. *D'Orb.* Uruguay.  
 Childreni. *Gray.* Chili.  
 Colchaguensis. *Phili.* Chili.  
 delodontus. *Lam.* Rio Plata.  
 Demeraraensis. *Lea.* British Guiana.

diplodon. *Phili.* Chili.  
 disculus. *Lea.* Uruguay river.  
 Dunkerianus. *Lea.* River Macacon, Brazil.  
 effulgens. *Lea.* Brazil.  
 ellipticus. *Lea.* Brazil.  
 encarpus. *Lea.* Lake Nicaragua.  
 fluctiger. *Lea.* Yuruari river, Br. Guiana.  
 faba. *D'Orb.* Uruguay.  
 Foncki. *Phili.* Chili.  
 Fontainiana. *D'Orb.* Brazil.  
 funebris. *Lea.* Uruguay river.  
 Gabbianus. *Lea.* Lake Nicaragua.  
 Gassicssii. *Grat.* Valparaiso.  
 gigas. *Swain.* —?   
 granosus. *Brug.* Guiana.  
 granuliferus. *Dunk.* Rio Janeiro.  
 gratus. *Lea.* Uruguay river.  
 Hjalmarsoni. *Dunk.* Honduras.  
 hylæus. *D'Orb.* Bolivia.  
 ianthinus. *Phili.* Chili.  
 imbricatus. *Mörch.* Nicaragua.  
 Jacobæus. *Phili.* Chili.  
 jaspideus. *Hupé.* Brazil.  
 Kraussii. *Lea.* Maroini river, Surinam.  
 Landbecki. *Phili.* Chili.  
 lepidior. *Lea.* Uruguay river.  
 locellus. *Lea.* Buenos Ayres.  
 longus. *Phili.* Chili.  
 membranaceus. *Mat.* Rio Plata.  
 modestus. *Fer.* Brazil.  
 montanus. *Phili.* Chili.  
 multistriatus. *Lea.* Rio Parahiba, Brazil.  
 Nicaraguensis. *Lea.* Lake Nicaragua.  
 nocturnus. *Lea.* Uruguay river.  
 Orbignyi. *Déville.* Upper Amazon.  
 Ortonii. *Lea.* Ecuador.  
 Paraguayensis. *Lea.* Paraguay.  
 Paranensis. *Lea.* Uruguay river.  
 parallelopipedon. *Lea.* Corrientes, Argentine Republic.  
 parcus. *Lea.* —?   
 Patagonicus. *D'Orb.* Rio Negro.  
 patelloides. *Lea.* Uruguay river.  
 peculiaris. *Lea.* —?   
 peræformis. *Lea.* Uruguay river.  
 piceus. *Lea.* Uruguay river.  
 piger. *Lea.* Uruguay river.

prunoides. *Lea.* —?  
 psammoicus. *D'Orb.* Rio Parana.  
 ravistellus. *Morel.* Lake Yzabal, Guatemala.  
 rhombus. *Wag.* Rio Solimoens. Brazil.  
 rhuacoicus. *D'Orb.* Uruguay.  
 rotundus. *Wag.* Rio San Francisco.  
 rudus. *Lea.* Rio de la Plata.  
 rufofuscus. *Lea.* —?  
 solidulus. *Phili.* Chili.  
 suavidicus. *Lea.* River Amazon.  
 trifidus. *Lea.* Buenos Ayres.  
 Uruguayensis. *Lea.* Uruguay river.  
 variabilis. *Lea.* Brazil.  
 Veræ-Pacis. *Trist.* Guatemala.  
 Voldivianus. *Phili.* Chili.  
 Wheatleyanus. *Lea.* River Amazon.  
 Wymani. *Lea.* Uruguay river.

## NEW HOLLAND, &amp;c.

Aucklandicus. *Fide Woodward.*  
 Australis. *Lam.* —?  
 Balounensis. *Con.* Balonne river.  
 cucumoides. *Lea.* Hunter's river.  
 cultelliformis. *Con.* Bogan river.  
 depressus. *Lam.* —?  
 Evansi. *Ad. & An.* Murray river, So. Australia.  
 Mortonicus. *Reeve.* Australia.  
 multidentatus. *Phili.* —?  
 Napeanensis. *Con.* Napean river.  
 Novæ Hollandiæ. *Gray.* Macquarrie river.  
 profugus. *Gould.* Hunter's river.  
 Stuarti. *Ad. & An.* Port Jackson.  
 Wilsonii. *Lea.* Eastern branch of Isaac's Plain, New South Wales.  
 —? *Con.* Bogan river.

## HABITAT UNKNOWN.

angustus. *Lam.*  
 emarginatus. *Lea.*  
 Liebmanni. *Phili.*  
 melleus. *Lea.*  
 navigilioformis. *Lea.*  
 Prusii. *Bourg.*  
 Smithii. *Gray.*  
 truncatus. *Swain.*

## IV. SUBGENUS MARGARITANA.

## EUROPE.

margaritifera. *Lea.* Northern rivers.

## NORTH AMERICA.

Alabamensis. *Lea.* Talladega creek, Ala.  
 arcula. *Lea.* Altamaha river, Ga.  
 calceola. *Lea.* Ohio river.  
 complanata. *Lea.* Ohio river.  
 confragosa. *Say.* Ohio river.  
 Connesaugaensis. *Lea.* Gilmer county, Ga.  
 Curreyana. *Lea.* Stone's river, Tenn.  
 dehiscens. *Lea.* Ohio river.  
 deltoidea. *Lea.* Ohio river.  
 Elliottii. *Lea.* Columbus, Ga.  
 elliptica. *Lea.* Tombigbee river, Ga.  
 Etowaensis. *Con.* Etowah river, Ga.  
 fabula. *Lea.* Cumberland river, Tenn.  
 Georgiana. *Lea.* Etowah, Ga.  
 Gesnerii. *Lea.* Uphaupee creek, Ala.  
 Hildrethiana. *Lea.* Ohio river.  
 Holstonia. *Lea.* Holston river, Tenn.  
 margaritifera. *Lin.* Pennsylvania, Mass., &c.  
 marginata. *Say.* Schuylkill river, Pa.  
 minor. *Lea.* Tennessee.  
 quadrata. *Lea.* East Tennessee.  
 radiata. *Lea.* South Alabama.  
 Raveneliana. *Lea.* French, Broad river, N. C.  
 rugosa. *Bar.* Ohio river.  
 Spillmanii. *Lea.* Tombigbee river, Missi.  
 Tombigbëensis. *Lea.* Tombigbee river, Missi.  
 triangulata. *Lea.* Georgia and So. Carolina.  
 undulata. *Say.* Schuylkill river, Pa.

## AFRICA.

Tripolitana. *Fer.*  
 Pfeifferiana. *Bern.* Gabou.  
 Vignouana. *Bern.* Gabou.

## SOUTH AMERICA.

incurva. *Fer.*

## V. SUBGENUS PLAGIODON.

## SOUTH AMERICA.

isocardioides. *Lea.*

## VI. SUBGENUS MONOCONDYLŒA.

## EUROPE.

Bonellii. *Fer.* River Po.

## ASIA.

Cambodjensis. *Petit.* Cambodia.  
 compressa. *Lea.* Siam.  
 crebristriata. *Anth.* Pegu.  
 Cumingii. *Lea.* Malacca.  
 exilis. *More.* Cambodia.  
 inoscularis. *Gould.* Tavoy, India.  
 Mardinensis. *Lea.* River Tigris.  
 Mouhotiana. *Lea.* Siam.  
 Peguensis. *Anth.* Pegu.  
 planulata. *Lea.* Java.  
 rhomboidea. *Lea.* Euphrates river.  
 Salweniana. *Gould.* Salwen river, Tavoy, India.  
 Sauleyi. *Bourg.* Jaffa, Syria.  
 Vondembuschiana. *Lea.* Java.  
 Wheatleyi. *Lea.* River Tigris.

## SOUTH AMERICA.

Corrientensis. *D'Orb.* Rio Corrientes.  
 costulata. *Mori.* Brazil.  
 fossiculifera. *D'Orb.* Rio Parana, Argentine Republic.  
 Franciscana. *Mori.* Brazil.  
 Guarayana. *D'Orb.* Rio San Miguel, Bolivia.  
 lentiformis. *Lea.* —?  
 Minuana. *D'Orb.* Uruguay.  
 Paraguayana. *D'Orb.* Rio Parana.  
 Parchappii. *D'Orb.* Rio Parana.  
 Pazii. *Lea.* —?  
 reticulata. *Mori.* Amazon.  
 Tamsiana. *Dunk.* Porto Cabello.

## VII. SUBGENUS DIPSAS.

## ASIA.

discoideus. *Lea.* China.  
 plicatus. *Leach.* China.

## VIII. SUBGENUS ANODONTA.

## EUROPE.

cygnea. *Lin.* All rivers, probably.

## ASIA.

Burroughiana. *Lea.* Luconia, near Manilla.  
 crepera. *Lea.* Bongaboe, Luzon, Philippines.  
 gibbum. *Benson.* Shanghai.  
 gracilis. *Lea.* Dingle, Isle of Panay.  
 Harlandi. *Baird & Ad.* Shanghai.  
 magnifica. *Lea.* China.  
 Schrenkii. *Lea.* Amur.  
 subcrassa. *Lea.* Lazuna de Bai, Luzon, Philippines.  
 Swinhoei. *H. Adams.* Formosa.  
 tenuis. *Lea.* Sual, Luzon, Philippines.  
 Vescoiana. *Bourg.* Anatolia.  
 Woodiana. *Lea.* China.

## AFRICA.

arcuata. *Fer.* Egypt.  
 Chaiziana. *Rang.* Senegal.  
 Dahomeyensis. *Lea.* Dahomey, W. Africa.  
 Guillaini. *Recluz.* N. E. coast.  
 rugifera. *Dunk.* Gabon.  
 Senegalensis. *Lea.* Senegal.

## NORTH AMERICA.

angulata. *Lea.* Lewis's river, Oregon.  
 argentea. *Lea.* Stone's river, Tenn.  
 Arkansensis. *Lea.* Little Arkansas river.  
 Bealei. *Lea.* Leon county, Texas.  
 Benedictii. *Lea.* Lake Champlain.  
 Bridgesii. *Lea.* Lake Nicaragua.  
 Buchananensis. *Lea.* Buck creek, Ohio.

- Californiensis. *Lea*. Rio Colorado.  
 carinifera. *Con*. Kentucky.  
 coarctata. *Anton*. Mexico.  
 corpulenta. *Coop*. Lake of the Woods and  
 Upper Mississippi.  
 Couperiana. *Lea*. Hopeton, Ga.  
 cultrata. *Gould*. —?  
 cylindraca. *Lea*. Medellin river, Mexico.  
 Dallasiana. *Lea*. Lake Winnipeg, Canada.  
 Danielsii. *Lea*. Topeka, Kansas.  
 Dariensis. *Lea*. Darien, Ga.  
 decora. *Lea*. Ohio river.  
 denigrata. *Lea*. Campbell county, E. Tenn.  
 doliaris. *Lea*. Union county, N. C.  
 Dunlapiana. *Lea*. South Carolina.  
 edentula. *Say*. Ohio river.  
 ferruginea. *Lea*. Simon's creek, Ind.  
 Ferussaciana. *Lea*. Ohio river.  
 fluviatilis. *Dill*. Schuylkill river, Pa.  
 Footiana. *Lea*. Fort Winnebago, Wis.  
 fragilis. *Lam*. Newfoundland and Northern  
 United States.  
 Gesnerii. *Lea*. Uphaupee creek, Ala.  
 gibbosa. *Say*. Georgia.  
 gigantea. *Lea*. Port Gibson, Missi.  
 glauca. *Valen*. Acapulco, Mexico.  
 globosa. *Lea*. Concha Lake, Mexico.  
 Granadensis. *Lea*. Lake Nicaragua.  
 grandis. *Say*. Upper Mississippi.  
 Hallenbeckii. *Lea*. Uphaupee creek, Ala.  
 Harpethensis. *Lea*. Harpeth river, Tenn.  
 Henryana. *Lea*. Mexico.  
 imbecillis. *Say*. Ohio river.  
 implicata. *Say*. Massachusetts.  
 inaequivalva. *Lea*. Lake Nicaragua.  
 Jewettii. *Lea*. Lake Nicaragua.  
 Kennerlyi. *Lea*. Chiloweyuck, Puget Sound,  
 Washington Territory.  
 Kennicottii. *Lea*. Great Slave Lake.  
 lacustris. *Lea*. Crooked Lake, N. Y.  
 lenticularis. *Lea*. Lake Nicaragua.  
 Leonensis. *Lea*. Leon county, Texas.  
 Leolandi. *Gup*. Trinidad.  
 Lewisii. *Lea*. Mohawk, N. Y.  
 Linnæana. *Lea*. Lake Concordia, La.  
 luteola. *Lea*. Isthmus of Darien.  
 Marryatana. *Lea*. Fort Winnebago, Wis.  
 micans. *Anth*. Texas.  
 modesta. *Lea*. Kalamazoo, Mich.  
 Montezuma. *Lea*. Central America.  
 Napolatensis. *Sow*. Mexico.  
 Nicaragua. *Phili*. Lake Nicaragua.  
 Nuttalliana. *Lea*. Wahlamat river, Oregon.  
 oblita. *Lea*. Campbell county, E. Tenn.  
 opaca. *Lea*. New Orleans, La.  
 Oregonensis. *Lea*. Wahlamat river, Oregon.  
 ovata. *Lea*. Marietta, Ohio.  
 Pallegoixi. *Cum*. Mt. Siam.  
 papyracea. *Anth*. Tennessee.  
 pavonia. *Lea*. Little Beaver, Ohio.  
 Pepiniana. *Lea*. Lake Pepin, Ohio.  
 plana. *Lea*. Ohio river.  
 plicata. *Hald*. Cumberland river, Ky.  
 salmonia. *Lea*. Poland, Ohio.  
 Shafferiana. *Lea*. Horn Lake creek, Tenn.  
 Showalterii. *Lea*. Coosa river, Ala.  
 Simpsoniana. *Lea*. Great Slave Lake.  
 Stewartiana. *Lea*. New Orleans, La.  
 Streblii. *Lea*. Vera Cruz, Mexico.  
 subcylindraca. *Lea*. Oak Orchard creek,  
 New York.  
 subglobosa. *Anth*. Michigan.  
 suborbiculata. *Say*. Mississippi river, near  
 Alton.  
 subvexa. *Con*. Black Warrior, Ala.  
 tetragona. *Lea*. Alexandria, La.  
 Texasensis. *Lea*. Texas.  
 Tryonii. *Lea*. Schuylkill river, Pa.  
 undulata. *Say*. Schuylkill river, Pa.  
 virens. *Lea*. Red river, Alexandria, La.  
 virgulata. *Lea*. Roanoke river, N. C.  
 Wahlametensis. *Lea*. Wahlamet river, Ore-  
 gon.  
 Wardiana. *Lea*. Scioto river, Ohio.  
 Youkanensis. *Lea*. Alaska.

## SOUTH AMERICA.

- Amazonensis. *Lea*. Upper Amazon.  
 anserina. *Spix*. Brazil.  
 atrovirens. *Phili*. Nicaragua.  
 Blainvilliana. *Lea*. Corrientes river.  
 Cailliaudii. *Lea*. Brazil.  
 carinata. *Dunk*. New Granada.

cornea. *Phili.* Nicaragua.  
 crassa. *Swain.* Rio Plata.  
 crispata. *Lam.* Cayenne.  
 elongata. *Swain.* Brazil.  
 ensiformis. *Spix.* Bolivia.  
 esula. *Jan.* Bolivia.  
 Forbesiana. *Lea.* Uruguay river.  
 Georginæ. *Gray.* —?  
 Holtonis. *Lea.* Upper Cauca, New Granada.  
 incarum. *Phili.* Peru.  
 lato-marginata. *Lea.* Rio Parana.  
 limnoica. *D'Orb.* Corrientes, Argentine Rep.  
 lucida. *D'Orb.* Uruguay.  
 Moricandii. *Lea.* Bahia, Brazil.  
 Mortoniana. *Lea.* Rio Parana.  
 Napoensis. *Lea.* Equador.  
 obtusa. *Spix.* Brazil.  
 Parishii. *Gray.* Paraguay.  
 Patagonica. *Lam.* Rio Plata and Patagonia.  
 Pazii. *Lea.* —?  
 porcifer. *Gray.* Paraguay.  
 puelchana. *D'Orb.* Rio Negro, Patagonia.  
 pulvinata. *Hupé.* South America.  
 rubicunda. *Lea.* Uruguay river.  
 Schröteriana. *Lea.* Rio Negro, Brazil.  
 siliquosa. *Spix.* Brazil.  
 sinuosa. *Lam.* —?  
 sirionos. *D'Orb.* Corrientes, Argentine Rep.  
 solenidea. *Sow.* Rio Francisco.  
 soleniformis. *D'Orb.* Rio Negro, Brazil.  
 solidula. *Deville.* Upper Amazon.  
 Spixii. *D'Orb.* Rio Parana.  
 suavidicus. *Lea.* River Amazon.  
 subrostrata. *Phili.* Peru.  
 subsinuata. *Phili.* Peru.  
 tenebricosa. *Lea.* Rio Plata.  
 Texasensis. *Lea.* Texas.  
 tortilis. *Lea.* Carthagera.  
 trapezialis. *Lam.* Brazil.  
 trigona. *Spix.* Rio Negro, Brazil.

Trautwiniana. *Lea.* Carthagera.  
 Ucayalensis. *Phili.* Peru.  
 Uruguayensis. *Lea.* Uruguay river.  
 Wheatleyi. *Lea.* Para.  
 Wymanii. *Lea.* Uruguay river.

## NEW HOLLAND.

purpurea. *Valen.*

## HABITAT UNKNOWN.

uniopsis. *Lam.*

The following species are unknown to me:—

## EUROPE.

Anodonta curvatus. *Fer.*

## ASIA.

Anodonta folium. *Fer.*

Anodonta Chinensis. *Fer.*

## AFRICA.

Anodonta arcata. *Cail.* Egypt.

Lucasii. *Desh.* Algiers.

Tawaii. *Rang.* —?

## NORTH AMERICA.

Anodonta lugubris. *Say.* Cumberland river,  
Tenn.

Anodonta impura. *Say.* Mexico.

## FOSSIL SPECIES.

## NORTH AMERICA.

Anodonta? Abyssina. *Mort.*



GENUS COLUMBA.

SOUTH AMERICA.

Blainvilliana. *Lea.* ——?  
esula. *Jan.* Bolivia.

GENUS BYSSANODONTA.

SOUTH AMERICA.

Paranensis. *D'Orb.* Rio Parana.

## GENUS PLATIRIS.

## I. SUBGENUS IRIDINA.

## AFRICA.

- Leaii. *Sow.* Senegal.  
 ovata. *Swainson.* Senegal.  
 exotica. *Lam.* Senegal.  
 Spekii. *Woodward.* Lake Tanganyika.

## HABITAT UNKNOWN.

- valeus. *Parr.*  
 solida. *Anton.*

## II. SUBGENUS SPATHA.

## AFRICA.

- alata. *Lea.* Lake Nyassa.  
 Baikii. *H. Adams.* River Niger.  
 caelestis. *Lea.* Kordofar and Gambia.

- dubia. *Lea.* Senegal.  
 modesta. *Lea.* Mozambique.  
 Natalensis. *Lea.* Umpingave river, So. Af.  
 Nyassaensis. *Lea.* Lake Nyassa.  
 rubens. *Lam.* Nile and Senegal.  
 Walbergi. *Krauss.* Natal, So. Af.

## III. SUBGENUS MYCETOPUS.

## SOUTH AMERICA.

- falcatus. *Higg.* Upper Amazon.  
 pygmæa. *Spix.* Paraguay.  
 siliquosus. *D'Orb.* Corrientes and Santa Cruz in Bolivia.  
 soleniformis. *D'Orb.* Santa Cruz, Bolivia.  
 ventricosus. *D'Orb.* Corrientes in Bolivia.

## NEW HOLLAND.

- rugatus. *Sow.* Australia.

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<sup>1</sup> When in Paris, in 1853, Mr. Deshayes, now Professor in the Museum of Paris, and the author of that admirable work, *Traité Élémentaire de Conchyliologie*, very kindly gave me a copy of his MS. list of the Bibliography of the Family *Unionidæ*, which he had brought up to 1843, and numbering over 250 entries. To these I have added a large number, and I have continued the list up to the time of going to press. It now consists of over 1100 works where some member of the Family is described or mentioned. It may be observed that some titles are much contracted. This has often arisen from the fact of their being cited at second hand, access to the original work not being possible. My friend Dr. Lewis, of Mohawk, N. Y., very kindly assisted me in the arrangement of my matter, as well as by adding some items.

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- Zeigler*.....MSS.



## APPENDIX.

SINCE the printing of these Tables was commenced, about a year since, the following matter came under my notice, and I have deemed it important enough to put it in this form.

In the *Journal of the North-China Branch of the Royal Asiatic Society* for December, 1865, which came too late into my hands for notice in its proper place, I find a very interesting article entitled Notes on the "Geology of the Great Plain," by Dr. Lamprey, Surgeon H. M.'s 67th Reg't. In the careful examination of the district of Shanghai he gives the product of an artesian well, 252 feet deep. Between 45 and 60 from the surface "fragments of shells" were found, and plants and bark of a tree at 180 feet. In an earth pit, "land shells and stems of plants" were also found. "Two feet from the surface there were fossil shells of *Paludina*," &c. p. 11. Further on, p. 14, he says that "remains of shells belonging to *Paludina*, *Planorbis*, *Unio*, *Anodonta*, and *Cyrena* are scattered over the surface of the soil both in Kiang-see and Pe-chi-li, and buried in it at various depths. They are also found "still in a living state." Among the bivalves found he says "I have met with a form (figs. 20 and 21) which appears to be a marine species; it is found in a fossil state in the low swampy ground at the south side of Tien-tsin city," &c. This very remarkable shell is unquestionably *Triquetra contorta*, Lea: see *Obs. on Unio*, vol. vi. p. 39, pl. 33, f. 33, specimens of which I obtained and described in 1857 in the *Journal of the Academy of Natural Science* as coming from the fresh waters of Northern China, some of my specimens coming from Shanghai. Dr. Lamprey figures two other species of *Unionidæ* without specific names. "Anodonta, fig. 14," is *Dipsas discoideus*, Lea. *Obs.*, vol. i. p. 187. "Unio, fig. 15," is *Unio Wrightii*, Lea. *Obs.*, vol. xii. p. 43. He mentions other specimens, one of which he says is an *Anodonta* of "10 by 6½ inches." This is evidently *Dipsas plicatus*, Leach. A "*Unio* 8 inches by 5¼" is unknown among Chinese collections, and is probably a more perfect specimen of *D. plicatus*.

A very valuable paper, "Ueber südbrasilische Land- und Süsswasser Mollusken," by Dr. Ed. von Martens, in *Malakoz. Blätt.* 1858, was not in my possession in time to place his name after the species cited which he there notices. There are twenty-nine species of *Unionidæ* which had been described by Lamarck, D'Orbigny, Spix, Küster, Hupé, and myself, many of which he considers to be synonyms.

Another valuable memoir came too late to be inserted in the systematic tables: "Beiträge zur Entwicklungsgeschichte der Najaden," by Dr. F. A. Forel, Morges, Switzerland. This is a most able exposition of the development of the *Unionidæ*, giving the histology of the subject, and executed with a minuteness and perfection heretofore unreached as to embryonic development and anatomical exactness. There are three excellent plates with accurate figures of the progress of Maturation of the Ovarian Egg, Segmentation of the Yolk, Byssus organs, &c.

Revision of the Classification of the Mollusca of Mass. By W. H. Dale Pro. Boston Soc. Nat. Hist., Mar. 16, 1870.

Mousson. Species described in *Mal. Blätt.* 1869, p. 185:

*Castalia ecarinata*.

*Plagiodon rotundatus*.

*Anodonta Wallisi*.

*Malzine*, in *Essai sur la Fauna Mal. de Belgique*, 1869, gives the following as new species, which I consider as doubtful:

- Unio Lambottei*.  
 “ *Ryckholtii*.  
 “ *Robianoii*.

*Gentiluomo*, in *Bull. Mala. Ital.*, Pisa, vol. i.:

- Unio Lawleyianus*.

*Möreh*, in *Am. Jl. Conch.*, vol. v. p. 38, informs us that *Unio Grœnlandicus*, Schröt., is the same as *testudinarius*, *Speng.* (*marginalis*, *Lam.*) from Tranquebar.

*Villa*. A letter of March 10, 1870, from Sig. Villa, Milan, asks my decision on a *Unio Danelli* described by him, from Melbourne, Australia, but I have not had the advantage of seeing the shell, nor of receiving the description which he sent to me.

*Wiegmann*. *Mollusca. Arch. für Nat.*, 1835, vol. i. p. 317.

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*Von Martens*. *Ueber Südbrasilische Land- und Süsw. Moll.*, *Mal. Blätt.*, 1868, came too late to insert the species in the Synonymy of the Synopsis.

*Ludwig*. *Unio Münzenbergensis. Palæontologia*, vol. viii.

*Sowerby*, in *Conch. Icon.*, pts. 278, 279, 280, 281:

- Hyria exasperata* . . . = *corrugata*, *Lam.*  
 “ *latialata* . . . . = “ “  
 “ *rugosissima* . . . = “ “  
 “ *recta* . . . . . = *subviridis*, *Klein.*  
 “ *alata* . . . . . = “ “  
*Castalia Schombergiana* = *Prisodon truncatus*, *Schum.*  
 “ *ovata* . . . . . = “ “ “  
 “ *Hanleyana* . . . = “ “ “  
 “ *Carolinensis*\* . = “ “ “  
 “ *quadrata* . . . . = “ “ “  
 “ *dollabella* . . . = *Duprei*, *Recluz.*  
*Anodonta biangulata* . . = *angulata*, *Lea.*

\* The habitat given is South Carolina. No species of this genus has been observed in North America

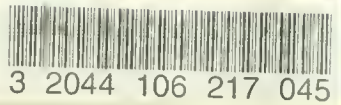












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